REPORT

7th National Conference on "Application of Assistive Devices in Education of CWSN"

RCI CRE STATUS ACCREDITED

Friday, 29th November 2019

Venue:
Tecnia Auditorium
Madhuban Chowk, Rohini, Delhi- 110085

The Ashtavakra

ASHTAVAKRA

Institute of Rehabilitation Sciences and Research

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7th National Conference
on
"Application of Assistive Devices in Education of CWSN"

Friday, 29th November 2019

Venue:
Tecnia Auditorium
Madhuban Chowk, Rohini, Delhi-110085

Organised by:

ASHTAVAKRA
INSTITUTE OF REHABILITATION SCIENCES & RESEARCH

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PREFACE

Ashtavakra Institute of Rehabilitation Sciences and Research, is a premier Institute working in the field of rehabilitation and health services since last three decades. The institute is approved by Rehabilitation Council of India, a statutory body under Ministry of Social Justice and Empowerment, Govt of India, recognized from National Trust and registered under PwD (Person with Disability) Act 1995, affiliated to Guru Gobind Singh Indraprastha University Delhi.

The Institute offers Bachelor Degree in Special Education Hearing Impairment (HI), Intellectual Disabilities (ID) and Autism Spectrum Disorder (ASD). The Institute also offers Bachelor Degree in Audiology and Speech Language Pathology (ASLP). The under graduate programmes offered are Diploma (Special Education) in Autism Spectrum Disorder, Cerebral Palsy, Hearing Impairment, Deafblindness, Intellectual Disabilities and Visual Impairment. The institute's barrier free infrastructure provides access to all and ensures value based quality education, training, research & consultancy, in the field of rehabilitation.

To further upgrade the knowledge of professionals in special education and rehabilitation, it conducted **7th National Conference on "Application of Assistive Devices in Education of CWSN"** on Friday 29th November 2019 at Tecnia Auditorium, Madhuban Chowk, Rohini, Delhi.

The conference provided an appropriate platform to all academicians, intellectuals, researchers and scientists for capturing & sharing expertise on Application of Assistive Devices in Education of CWSN. Panel discussion provided ways on teaching strategies to support children in mainstream classroom.

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CONTENTS

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MESSAGE

It is my pleasant privilege to be a part of **7th National Conference on "Application of Assistive Devices in Education of CWSN"** on Friday 29th November 2019 at Tecnia Auditorium, Madhuban Chowk, Rohini. Tecnia Group of Institutes are highly committed to excellence in education and bring in a close association between Business, Education and Society.

Differently challenged segment of our society, which is very large in size and beseeched with multi-dimensional problem is highly neglected sector. This segment needs special attention from the society, planners and various governments world over. Basic requirement is to empower these individuals towards self sustenance, which cannot be possible; unless capability build up is ensured through special means. Towards achieving this objective, huge forces of specially trained human resources are required. Towards this need, even Government of India has taken various initiatives. To make a beginning, first need is to have reliable data on number of citizens afflicted with different challenges. Census-2014 was the first effort to consolidate this information on, country wide basis.

Tecnia group is providing professional training in different disciplines to large number of students, who can in turn facilitate better utilization of various faculties by differently challenged individuals and help them in improvement of their productivity and also improve their quality of life. We have set a mission to establish a global university, which provide special training for the professionals, who are engaged in the management of differently challenged people.

I extend my congratulations to Ashtavakra Institute of Rehabilitation Sciences & Research on successful conduct of this conference and I am very sure that conclusions drawn out after the conference would be highly beneficial for all the spectrums of the society viz. planners, implementers and various beneficiaries from the differently challenged communities.

Dr. R. K. Gupta
Chairman
Tecnia Group of Institutes

Dr Anmol Arora
Medical Director

Ashtavakra Institute of Rehabilitation Sciences & Research
PSP Institutional Area, Madhuban Chowk
Rohini, Delhi-110 085

Message

We live in an enlightened world of knowledge, where each and everyone is Special. Everyone has the Right to light their Future Bright. As the sun doesn't differentiate anyone in sharing the ray of Light, so do we.

India is one of the few countries in the world that is blessed with rich cultural heritage, one of the oldest human civilizations, and highly hard working pool of young people seeking new knowledge and education to raise India's stature to the top three economies in the world. This requires the development and proliferation of quality higher educational systems in India.

Tecnia Group of Institutes has always been alive to the academic needs of the country, and has provided a visionary diversification in innovative education with global paradigms. The establishment of Ashtavakra reflects a positive strides in this direction aimed at producing quality rehabilitation professional capable of strengthening and broadening the base of rehabilitation education in India .

At Ashtavakra the guiding vision and mission is to pursue excellence constantly in all its endeavors while providing world class education to its students and producing rehabilitation professionals who can serve to reduce the mismatch between the availability and demand for skilled human resourses.

Ashtavakra in the short span has stirred up a new awakening in the field of rehabilitation and are being witnessed as a array of progress in the areas of rehabilitation, which have a direct bearing on the spectacular development in Rehabilitation field.

The various programmes offered at Institute are designed to be a gateway to achieve success and overcome global scarcity of skilled and trained human resource in field of Rehabilitation. However we strive towards making learning a continuous which helps generate fresh idea and exudes enthusiasm. Besides latest academic inputs, the students are also given full fledged clinical exposure through various projects, visits & guest lectures and this keep them in sync with the practicalities of the world. All this is done in a congenial atmosphere which accelerates the student's growth process and paves the way for them to become skilled professionals .

It provides friendly and inviting atmosphere in the classroom where students are comfortable in sharing their thoughts, opinions, and questions with the class teacher as well as among themselves. Faculty fosters the interdisciplinary approach to teaching and learning in the class room and prepares students for future challenges and aims to unleash the hidden talent and develop the full potential of the Special.

In order to achieve our goal of spreading the ray of Hope and Happiness, we have five specialized wings.

1. The Ashtavakra School
2. Ashtavakra Institute of Rehabilitation Sciences & Research
3. Ashtavakra Vocational Institute
4. Ashtavakra India Foundation
5. Ashtavakra Rehabilitation Centre

Indeed a fascinating world! Thats the world of Ashtavakra an intersection where legacy, knowledge, experience and innovation come together to draw a blueprint of a world more cohesive in terms of understanding past and future knowledge, frontiers explored and unexplored, opportunities seized and invented for rehabilitation .

Dr Anmol Arora
Medical Director

NORTH DELHI MUNICIPAL CORPORATION
OFFICE OF THE DEPUTY COMMISSIONER
KESHAV PURAM ZONE

IRA SINGHAL, IAS
DY. COMMISSIONER (KPZ)

No. 453/DC/KPZ/2020
Dated: 26.02.2020

Message

I am happy to note that Ashtavakra Institute of Rehabilitation Sciences & Research had organized one day National Conference on "Application of Assistive Devices in Education of CWSN" on 29th November 2019 at Tecnia Auditorium, Madhuban Chowk, Rohini, Delhi successfully.

I wish entire team of Ashtavakra Institute of Rehabilitation Sciences & Research all success in their future endeavors and pray for bright future.

Yours sincerely

(IRA SINGHAL), IAS
Deputy Commissioner
Keshav Puram Zone
North Delhi Municipal Corporation

- **All India Rank - 1 UPSC Civil Services Examination 2014**
- **Brand Ambassador, Ministry of Social Justice & Empowerment, Government of India**
- **Brand Ambassador, Ministry of Women & Child Development, Government of India**
- **Brand Ambassador, Niti Ayog, Government of India**
- **Member, National Panel for Accessibility, Election Commission of India**
- **President's Gold Medal, IAS Training**
- **India Today Woman of the Year, 2015**
- **Limca Book Record Holder**

7th National Conference
on
"Application of Assistive Devices in Education of CWSN"

Friday, 29th November 2019

(From Left to Right), Dr. Palash Gupta, Orthopedic Surgeon, Max Hospital, Dr. Anmol Arora, Medical Director, AIRSR; Mr. Inder Singh, Deputy Director, Directorate of Education, GNCT, Delhi, Dr. Mansoor Alam, Director, Institute of Child Development, Delhi & Dr. Amjad Hussain, Associate Professor, AIRSR

Theme of National Conference:

- Changing practices in education of CWSN.
- Role of assistive devices in creating barrier free environment for education of CWSN.
- Role of modern assistive devices for developing communication for education of CWSN.
- Need based adaptation, accommodations and modifications of assistive devices for education of CWSN.
- Support and collaboration required for developing assistive devices for education of CWSN.
- Advocacy and leadership required for Assistive devices for education of CWSN.
- Resource mobilization required for developing assistive devices for education of CWSN.
- Role of Assistive devices for CWSN for literacy development.
- Use of modern software for education of CWSN.

7th National Conference was organized by Ashtavakra Institute of Rehabilitation Science and Research on 29th November 2019 on the topic "APPLICATION OF ASSISTIVE DEVICES IN EDUCATION OF CWSN" at Tecnia Auditorium.

The main goal of this one day National Conference was designed solely to understand application of assistive devices in the education of children with special needs.

The conference provided an appropriate platform to all Academicians, Intellectuals, Researchers and Scientists for capturing and sharing expertise on the aforesaid concept.

Children with disabilities are given opportunities to flourish as any other children, to contribute to the social, cultural and economic vitality of their communities. One of the most important requirement for children with disabilities to flourish is their access to assistive technology. For many children, assistive technology represents the enjoying the rights, which they were deprived of earlier .

Assistive technology includes products and related services that improve the functioning of children with disabilities. It can be instrumental for children's development and health, as well as for participation in various facets of life. These include communication, mobility, self-care, household tasks, family relationships, education, and engagement in play and recreation. Assistive technology can enhance the quality of life of both children and their families. Recognizing its importance, the Convention on the Rights of Persons with Disabilities (CRPD) urges governments to ensure the provision of affordable assistive technologies and related services in several of its articles. Too often, assistive technology has been a missing link in the chain of pre-requisites that enable children with disabilities to lead a life where they can enjoy and exercise their rights.

In the above background this 7th National Conference was been set forth. The present 7th National Conference provided information about schools' responsiveness to quality education of children with special needs.

7th National Conference 2019
Inaugural Session

The 7th National Conference was inaugurated by hon'ble chief guest Dr. Palash Gupta, Orthopedic surgeon, Max Hospital, Shalimar Bagh, Delhi along with Mr. Inder Singh, Deputy Director of Education, Delhi, Dr. Mansoor Alam, Director, Institute of Child Development, Delhi, Dr. Preeti Khanna, Assistant Professor, NAB, Delhi, Dr. Priyanka Bapna, ABA Expert, CRIA, Delhi, Dr. Hemlata, Director, NCDS, IGNOU and respected Dr. Anmol Arora, Medical Director, Ashtavakra Institute of Rehabilitation Sciences and Research, Dr. Amjad Hussain, Principal, Ashtavakra Institute of Rehabilitation Sciences and Research, Mrs. Sanjana Mittal, Deputy Director, Ashtavakra Institute of Rehabilitation Sciences and Research, Delhi.

Lamp lighting by Dr. Palash Gupta, Orthopedic Surgeon, Max Hospital, Delhi & Dr. Anmol Arora, Medical Director, AIRSR, during National Conference on "Application of Assistive Devices in Education of CWSN"

Lamp lighting by Dr. Mansoor Alam, Director, Institute of Child Development, Delhi.

Lamp lighting by faculty, Ashtavakra Institute of Rehabilitation Sciences and Research

Participants during National Conference on
"Application of Assistive Devices in Education of CWSN"

Welcome Address by Ms Snjana Mittal, Deputy Director
Ashtavakra Institute of Rehabilitation Sciences and Research

More than 500 participants comprising delegates, special educators, professionals, and expert from the field of academia attended the 7th National Conference.

Ms. Sanjana Mittal, Deputy Director, Ashtavakra Institute of Rehabilitation Sciences and Research welcomed all participants and provided an overview of the conference.

This was followed by opening remarks presented by Dr. Anmol Arora, Director Ashtavakra Institute of Rehabilitation Sciences and Research. He highlighted the need for education with adequate quality in mainstreaming schools for children with special needs.

All the guests for National Conference were presented with mementoes and bouquets as a honour from the Institute.

Opening Remarks by Dr. Anmol Arora, Medical Director
Ashtavakra Institute of Rehabilitation Sciences and Research

Dr. Anmol Arora, Medical Director, AIRSR, Ms Sanjana Mittal, Dy Director
& Dr. Amjad Hussain felicitating Dr. Palash Gupta, Orthopedic Surgeon,
Max Hospital, Delhi

Dr. Anmol Arora, Medical Director, AIRSR felicitating guest of honor,
Mr. Inder Singh, Deputy Director, Directorate of Education, GNCT, Delhi

Dr. Anmol Arora, Medical Director, AIRSR felicitating
Dr. Priyanka Bapna, ABA Expert, CRIA

Felicitation of Dr. Preeti Khanna, Assistant Professor, National Association for Blind, Delhi

Dr. Anmol Arora, Medical Director, AIRSR, Ms Sanjana Mittal, Dy Director
& Dr. Amjad Hussain felicitating Dr. Mansoor Alam, Director,
Institute of Child Development

Felicitation of Dr. Santosh Kumar, Occupational Therapist,
Chetna World of Therapeutic Services, Vasant Kunj, New Delhi

Felicitation of Dr. Hemlata, Director, National Centre for Disabilities Studies (NCDS),
Indira Gandhi National Open University by Dr. Anmol Arora, Medical Director, AIRSR

Address by guest of honor, Mr. Inder Singh, Deputy Director, Directorate of Education, GNCT, Delhi

Felicitation ceremony was followed by address given by guest of honor, Mr. Inder Singh, Deputy Director, Directorate of Education, GNCT, Delhi. He appreciated the efforts made by Ashtavakra Institute for using various assistive devices and innovations in regard of aids and appliances used by children with special needs to make their lives and education smooth.

The Keynote address was given by Dr. Palash Gupta, Orthopedic Surgeon, Max Hospital, Shalimar Bagh, Delhi. He urged for innovation in assistive devices to be accessible to all and for this to happen he appealed to the mass to make a joint venture. His thought provoking address set a perfect platform for speakers to deliver their presentations in the areas matching to theme of National Conference 2019.

Dr. Amjad Hussain, Associate Professor, Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi extended vote of thanks to the most eminent speakers from renowned hospitals and Institutes who participated in the conference including Dr. Palash Gupta, Orthopedic surgeon, Max Hospital, Shalimar Bagh, Delhi along with Mr. Inder Singh, Deputy Director of Education, Delhi, Dr. Mansoor Alam, Director, Institute of Child Development, Delhi, Dr. Preeti Khanna, Assistant Professor, NAB, Delhi, Dr. Priyanka Bapna, ABA Expert, CRIA, Delhi, Dr. Hemlata, Director, National Centre for Disabilities Studies, Indira Gandhi National Open Univerisyt, Delhi and respected Dr. Anmol Arora, Medical Director, Ashtavakra Institute of Rehabilitation Sciences and Research, Dr. Amjad Hussain, Principal, Ashtavakra Institute of Rehabilitation Sciences and Research, Mrs. Sanjana Mittal, Deputy Director, Ashtavakra Institute of Rehabilitation Sciences and Research, Delhi.

Dr. Palash Gupta, Orthopedic Surgeon, Max Hospital, delivering Keynote Address

Dr. Amjad Hussain, Associate Professor, Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi extending vote of thanks

7th National Conference 2019
Technical Session-1

Dr. Priyanka Bapna, ABA Expert, CRIA, presenting her paper

Dr. Mansoor Alam, Director, Institute of Child Development, Delhi, addressing the delegates

Dr. Priyanka Bapna, ABA Expert, CRIA, Delhi, praised the efforts of Ashtavakra Institute of Rehabilitation Sciences and Research for organizing such a marvelous event keeping in view the welfare of persons with special needs. She highlighted the fact that children with autism face problem in communication. Every 3 out of 10 persons with autism use speech for communication. There are few children with autism who have intellectual disability which needs to be improved. Even if they can not communicate through speech, they can communicate through gestures, symbols or non-verbal cues via assistive devices which may also be called alternative or augmentative communication aids and appliances. Children with autism face problem in socialization so there is a need to develop contextual communication among them. Hence some sort of assistive devices are needed to educate them in inclusive set-up. As care giver of children with autism we need to take into account the antecedent cause of every resultant problem behavior.

Dr. Mansoor Alam, Director, Institute of Child Development, Delhi, talked about the importance of assistive devices used in education of children with special needs. At first he explained the concept of ICF i.e. international classification of functioning disability and health. He suggested all future and existing professional to have good understanding of ICF in their practices. He suggested to start with development of communication skills and then proceed to inculcating daily living skills and orientation and mobility and finally on ambulation skills. All such skills could be developed with the help of assistive device and can be helpful in enriching quality of life and improved self-esteem in these children with special needs. It is also a sophisticated tool for inclusion as it helps not only the children with disability but it is also an asset to children without disabilities as well. Through assistive devices they can develop literacy skills i.e. reading, writing and arithmetic skills in children with any kind of disability. Specifically for development of reading skills there are varieties of equipments which are readily available in the market which are not so costly in fact. Those parents who want to develop writing skills in their children they can take help from pamphlets, softwares, grammar checkers and adapted paper also. In regard to development of mathematical skills there are various kinds of calculators which are easily available.

Dr. Santosh Kumar, Occupational Therapist, Chetna World of Therapeutic Services, Vasant Kunj, addressing the delegates

Dr. Santosh Kumar, Occupational Therapist, Chetna World of Therapeutic Services, Vasant Kunj, Delhi, motivated the audience with his remarkable speech. He highlighted the fact that people are highly dependent on technology for leading a normal life. He expressed that how much we have become technology savvy and using assistive devices for a quality life. In his presentation he used a quote of Mary Pat Radabaugh which indicates that "For most people technology makes things easier. For people with disabilities, however, technology makes things possible."

Dr. Preeti Khanna, Assistant Professor, NAB, Delhi, expressed her happiness to choose the theme of pivotal importance for this conference. She said that we should work on removing environmental barriers in the society and focus on abilities not the disabilities of persons with special needs. She was sure that persons with special needs can also reach heights in their career if equality and accessibility is ensured.

Dr. Preeti Khanna, Assistant Professor, National Association for Blind (NAB), Delhi, presenting her paper

7th National Conference 2019
Technical Session-2

Paper presentation by Dr. Hemlata, Director, National Centre for Disabilities Studies, Indira Gandhi National Open University

Dr. Amjad Hussain, Associate Professor, AIRSR, Rohini, Delhi presenting the paper

Dr. Hemlata, Director, National Centre for Disabilities Studies (NCDS), Indira Gandhi National Open University, Delhi, expressed her views and shared her initiatives in the field of special education.

Dr. Amjad Hussain, Associate Professor, Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi,talked about classroom amplification devices used in education of children with hearing impairment in inclusive set-up.

Dr. Satya Narayan Nai, Associate Professor, Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi, expressed his views on the need for management of persons with special needs using various assistive devices in inclusive set-up.

Dr. Satya Narayan Nai, Associate Professor, Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi, expressing his views

Priya, student D.Ed (HI), AIRSR, Rohini, Delhi
presenting the paper

Kritika Ganesh, student D.Ed (HI), AIRSR, Rohini, Delhi
presenting the paper

Ms. Priya, student from Diploma in Special Education in Hearing Impairment, at Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi, expressed her views on the need of technology and ICT based learning using various assistive devices in the education of children with special needs.

Ms. Kritika Ganesh, another student of Diploma in Special Education in Hearing Impairment, at Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi, shared her ideas about role of assistive devices in education of CWSN.

At last, Dr. Satya Narayan Nai, Associate Professor, Ashtavakra Institute of Rehabilitation Sciences and Research, Rohini, Delhi, delivered the "Vote of Thanks" for the conference.

Participants of National Conference on "Application of Assistive Devices in Education of CWSN"

Learning of Deaf Students through Assistive Devices

Dr. Amjad Hussain
HOD (HI) & Principal
AIRSR

ABSTRACT:

This new era of inclusive education has made possible quality education to all children with or without disabilities in classroom for all. It has come out with improved educational, vocational and rehabilitative activities. Present article explores the effectiveness of assistive devices in the education and rehabilitation of children with hearing impairment in inclusive set-up. For this, all assistive devices used in education and rehabilitation of children with hearing impairment were studied for their effectiveness. After literature review it can be easily understood that assistive technologies laid significant impact on the education and rehabilitation of children with hearing impairment and also that such devices can have no substitute if we want to ensure quality in their education and rehabilitation services in inclusive set-up. In this article different role of high-tech and low-tech devices has also been explored.

Key words: Children with hearing impairment, assistive technology, assistive learning, and assistive devices, inclusive set-up.

Introduction

Assistive technology refers to the products or equipments that improve functional capacity of persons with disabilities. Assistive technology (AT) provides aid of adaptive technology to individuals with disabilities (UNESCO, 2006). At present we find wide range of assistive devices of high-tech and low-tech quality. High tech assistive devices functioned electronically while low tech assistive devices are manually operated (Dede, 1998, p.75).

In many cases low-tech technology have been proven as an effective instrument for the persons with disabilities because low-tech technology is comparatively cheaper and easy to handle. It supports persons with disabilities to the extent that reduce the cost of hospitalization (Posse & Mann, 2005).

The assistive devices falls under the category of support services provide through inclusive education services for betterment of education and rehabilitation of learners with special needs. After enactment of 'Right to Education Act' it is ensured that all children get quality education on equal basis and in this venture assistive devices play a vital role. However, the effect of particular technology is also taken in account before its actual use (Hersh& Johnson, 2003).

Assistive technological devices play a vital role in life of people who want to lead an independent life (Hameed & Bano, 2009). “Technology has opened many educational doors to children, particularly to children with disabilities. Alternative solutions based on technology are accommodating physical, sensory, and cognitive impairments in many ways” (Dede, 1998, p.73).

Slight modification in devices and technologies have smoothened the life of individual with disabilities. A flexible and user oriented approach is accepted in helping out the persons with disabilities (Penaud, Mokhtari & Abdulrazak, 2004).

Assistive devices are most important and they are very helpful devices through which “desired sound is sent to the listener's ears directly with improved signals to background noise ratio and reduce effects of poor room acoustics and diffused sounds” (Yi-Lin, 2005).

If we want to do intervention of any person with disability we may require certain type of assistive devices based on various technologies. Among all persons with disabilities it is persons with hearing impairment who may require more assistive technology than any other individual with other disabilities. For providing quality education and rehabilitation services to children with hearing impairment we may require assistive technology that revolve around the need, use, age, cost, level and disability of an individual. These assistive devices are helpful in mainstreaming individual with disabilities especially children with hearing impairment. Assistive devices are chosen according to individual need, use and fitting. Assistive technology can be used by the person throughout his or her life to make the things possible at any level of intellectuality (Bouck, Shurr, Tom, Jasper, Bassette, Miller & Flanagan, 2012).

Lee & Templeton (2008) mentioned that “Empirical studies consistently show that the use of assistive technology promotes self-confidence, freedom, independence, and meaningful participation in home, school and community”.

In the market you may find vide range of assistive devices based on high tech and low tech. both type of technological devices are used by children with hearing impairment for many years. Low tech and high tech interventions are used for the persons to overcome their educational and social barriers (Gitlow, Dininno, Choate, Luce &Flecky,2011).

Low tech devices are those assistive equipments that are available at the low cost and can be easily purchasable by the persons with disabilities (Cook &Hussay, 1995). Such devices cater the needs of individual with mild to moderate level of hearing loss in their better ear for enabling them to use their residual hearing capacity effectively. However, high technological devices are expensive, delicate, not easy to handle and their performance is more effective, reliable, convenient and relatively inexpensive (Seok & DaCosta, 2013).

Assistive devices basically make life of individual with disabilities easy and remove barriers to smooth daily routine life and enhance the functional aspects of life (Bouck, et.al 2012). While taking decision about selection of assistive devices one must take into account its cost, availability, funding, training and other related issues. It is argued that assistive devices must be economical, effective and congenial to the learning outcomes (Seok & DaCosta, 2013).

Assistive devices must be provided to all individuals with disabilities on right based. There must not be any kind of biasness on the basis of age, gender or socio-economic status (Borg, Larsson & Ostergren, 2011). It has been observed that cost of assistive devices at later stage deprive them to fulfil their desire to lead an independent life either in school or at home (Harris, 2010).

Cook & Hussay (1995) stated that "A girl, who was deaf and blind, is reported to have been asked whether she would prefer to have her vision or her hearing if she could have one or the other. She responded that she would prefer to have her hearing since she felt that people who are blind are cut off from things, whereas those who are deaf are cut off from people" (P. 662).

Many people avoid using hearing aid due it aesthetic restraint and there is a need to counsel them not to discontinue the habit of wearing the hearing aid as regular use of hearing aid helps individual with hearing impairment to use residual hearing resulting in better communication. It is expected that people who have more sensory problems are on the edge to use more high level devices (Yeager & Reed, 2008).

"People with hearing loss can benefit from devices such as hearing aids, assistive devices and cochlear implants, and from captioning, sign language training, educational and social support" (WHO, 2013).

It is being observed in a study that unlike all other disabilities only persons with hearing impairment are more likely to use assistive technology (Yeager & Reed, 2008). Individual with hearing impairment know the importance of assistive device and are aware of its ability to reduce the gaps between detection and occurrence of sounds (Lozano, Hernaez, Navas, Gonzalez & Idigoras, 2007). These assistive devices may be categorized into three broad terms: Hearing Assistive technology, Alerting devices, and Communication supportive technology.

Hearing Assistive Technology

This technology enables persons with hearing impairment in listening, detecting the sound and amplifying the intensity of sound for batter understanding (Bankaitis, 2007). Hearing aids, Cochlear implants, F.M systems, Infrared system, and loop system are some of the examples of the assistive listening devices.

Alerting Devices

These are devices which alert individual with disabilities through visual or vibro-tectile channel for the presence of sound in the environment. Vibrotactiles and signaling devices are some of the alerting tools (Hersh& Johnson, 2003).

Communication Supportive Technology

This technology is very helpful for individual with hearing impairment in establishing communication with outer world. Communication assistive technology can be categorized into three further systems as: Telecommunication (Cell phones, amplified and captioned telephones, pagers, TTY/TTDs), closed captioning, and person to person and group communication activities (Web cameras, computer assisting note taking devices, real time captioning and voice to text devices) (Hersh& Johnson, 2003).

For better education of children with disabilities it is quite essential to push themselves in learning and to deal with daily life problems (Maor, Currie, & Drewry, 2011). Dalton (2011) opines that "Assistive technology can be a powerful tool for educational equity, but only if technology-relevant content and skills are well-learned, well-practiced, and appropriately applied to meet the needs of both the individual and the educational environment".

Such technology enables a child to develop through the participation in all sort of life activities and day to day educational activities (Murchland & Parkyn, 2011).

It is very important to include parents to get their views that how effectively the assistive equipments helping their children to learn and is proving to be cost effective (Merbler, Hadadian & Ulman, 1999). Parents and schools must be aware that assistive technology improves the students learning possibilities. They must seek knowledge of assistive technology use so that they can enhance their skills to engage in students learning activities, which are happening effectively by using assistive technology (Weikle & Hadadian, 2003).

Various researches have proven the fact that assistive devices are helpful for persons with hearing impairment in various aspects of life in many ways to function normally, recognize speech and sounds (Poss& Mann, 2005. After using these assistive technology users do not concentrate over their devices after 2 to 4 years of use. These devices become part and parcel for their routine life functioning in day to day life.

"Lack of consideration of user opinion in selection, easy device procurement, poor device performance, and change in user needs or priorities" minimizes the use of assistive technology devices for successive years of lifetime (Philips & Zaoh (2010).

Conclusion:

Assistive devices are important instruments that are used by students with hearing impairment in inclusive set-up. Through this article we tried to analyse the effectiveness of assistive technologies on the learning of students with hearing impairment. It is safer to conclude that learners with hearing impairment are more independent learners and good achievers, no matter what kind and form of assistive devices they use. Among different forms of high and low technological assistive devices, hearing aids, cochlear implants, vibro-tactiles, loop, infrared and F.M systems are most commonly used by children with hearing impairment. Body level hearing aids are cheaper and the most preferred devices to children with hearing impairment in Indian context. Studies clearly show that thereis a difference in the learning achievements of students with hearing impairment who use high technological assistive devices as compared to that of low technological devices. By using the assistive devices family has brought drastic changes in the life of their wards with hearing impairment.

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Augmentative and Alternative Communication Devices: Role in Removing Barriers for Persons with Special Communication Needs

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We are living in an era which cannot be explained without talking about technology. Technology has not only removed the barriers but also has disclosed the ways to live a life with independence and dignity. Augmentative and Alternative Communication Devices are the technology-based resources to encounter all the limitations in achieving educational and socio-economical goals.

Assistive devices are adaptive and rehabilitative devices for people with disabilities or the elderly population. Persons with special communication needs often have difficulty in performing activities of daily living independently. Mostly, the term is used for the devices that help people overcome a handicap such as Aphasia, Cerebral Palsy, Autism, Multiple Sclerosis and Epilepsy.

What is Augmentative and Alternative Communication (AAC)

Pathology Australia (Speech Pathology Australia, 2012) defined Augmentative and Alternative Communication (AAC) as "an area of clinical and educational practice that provides communication interventions for people who have little or no functional speech or who have complex communication needs (CCN)". A person may have CCN due to intellectual, physical, sensory or environmental causes (Balandin, 2002). A person with CCN and "their communication partners are likely to benefit from the use of a range of AAC systems and communication support strategies to participate fully in all aspects of life" (Balandin, 2002).

Role and importance of AAC Systems and Strategies

The major role of AAC devices, systems and strategies are to support and improve the individual's ability to participate in his/her communicative environments with autonomy, choice and self-determination. These patterns also help the individuals to enhance scope for participation in social activities to lead in life.

AAC strategies are designed to support a person's speech abilities. Sometimes, speech may be replaced by a suitable medium due to varying reasons. We all know that communication is abi-polar process which needs both the terminals-receptive and expressive in active mode. Persons who have complex communication needs can communicate with the help of appropriate AAC devices.

AAC includes all forms of communication that are used to express thoughts, needs, wants, and ideas. We all use AAC when we make facial expressions or gestures, use symbols or pictures, or write. AAC may be used to support the understanding of communication as well as to promote expressive communication. AAC strategies need to be framed to the person so they "fit in" with lifestyle, environments, social circumstances and peers.

Unaided AAC

Unaided AAC patterns are the communication strategies which do not require the use of any external device. In other words, we can say that the user can apply whatever is available to them using their own body. This may include using eye gaze, facial expression, gesture and body language and even tone of voice too.

The best thing with Unaided AAC strategies are the benefits of being extremely portable because we don't need to carry external devices and are usually build as a skill the person already has.

When supporting a person who relies on unaided AAC techniques, it is important to provide orientation, training and support to their communication partners.

One example of a formal, unaided strategy is Key Word Sign and Gesture. The principles of Key Word Sign and Gesture involve the concurrent use of speech and manual sign with only the key words of the sentence being signed. It incorporates the use of natural gesture, facial expression and body language with simple sign language techniques such as directionality and placement.

The use of this strategy depends on the level of the person's physical abilities. Other unaided AAC strategies include: Gestures, pointing, vocalizations, body language, behaviors (e.g., taking a person's hand and leading them to the door), eye contact / eye gaze (within an environment) and facial express

Unaided AAC systems can be used alone or they can be used in conjunction with aided systems as a supplement and/or backup strategy. Most AAC users will blend systems to achieve the most effective communication. This approach is referred to as Multimodal Communication or Total Communication.

Aided AAC

Aided AAC devices are the communication strategies which involve the use of an external item. These are divided into:

- 'Low Technology' (low/light tech) equipment, such as a communication board, photographs or real objects
- 'High Technology' (high tech) aids, such as a computer or speech generating device (SGD).

Low tech aided AAC: Low tech AAC strategies involve the use of aids that do not require a power source to be operated. They include print outs, photos, drawings objects etc. Low tech AAC strategies can be considered a valuable addition to a person's AAC system as they can be simpler to operate and not prone to technical difficulties. They can often be used as a 'back up' to a person's high tech AAC system.

Examples of low tech AAC aids are: Schedules, timetables, choice-making supports, community request cards, communication boards, talking mats, picture exchange communication (PECS) systems, Pragmatic Organization Dynamic Display (PODD), alphabet display, pictures, letters or word boards, calendars, shopping lists, daily planners, diary, labels and signs, continuum lines, timers etc.

Low/ light tech AAC systems may be used to provide: visual information to support understanding, a means of expression for a person who may point to or pick up a desired picture or object to communicate a want, need, question or comment, a prompt or support for transitions between activities or warning of impending change, opportunity to make a choice or indicate a preference, express an emotion, a reminder of a person's role or responsibility.

High technology aided AAC: There are many opportunities for technology to be part of an AAC system. These options generally involve a person needing to activate a computer-like device that generates speech output to convey their message.

High tech communication aids that 'speak' after input are usually referred to as either voice output communication aids (VOCA) or speech generating devices (SGD). Speech generating devices can use digitized speech, synthesized speech or direct recorded speech, however not all people who use high tech AAC like or want their device to talk. It is important that all AAC systems have back up in some form. This means that if technical systems fail the person still has a system for communication.

When considering High Technology AAC there are two broad areas: Specified Communication Devices and General Computerized Devices

Specified communication devices are specifically for communication and may or may not have features such as computer interface or connection to the internet. However, these devices are often purpose built with a number of valued features for the user that include, but are not limited to, big memory allowances for graphics; software dedicated to the device; inbuilt symbol sets; backup and storage systems; full user customization; customer and user technical support servicing and warranties.

Communication devices have many different options. Some examples are:

Static Display- this means language or symbols are in a hard copy format, like an overlay or board and have to be changed manually

Dynamic Display- this means language is displayed in electronic pages and levels within the device which can change, usually through use of touch screen or scanning input

Text-to-Speech- this allows the user to type or input messages which are spoken.

Devices can range from single message voice output devices (e.g., BIG Mac), to devices with several options placed in a grid style presentation (e.g., Go Talk) and onto more expensive devices (e.g., Liberator, VMax) that contain a computer and are supported by complex software. There are many devices that are available and it is important to thoroughly assess and research the options to determine what is most appropriate for the person. Devices are constantly evolving as technology improves and changes, so it is important for practitioners to keep up to date.

These devices are not purpose built for communication but have applications which can allow different communication options. The popularity of tablet computers, such as iPods and iPads and their android counterparts, has prompted wider interest in this technology for AAC.

Alongside this development have been the advances in systems or platforms that allow for applications or "Apps" that enable the user to try different systems or programs. Some AAC users will have both a dedicated communication device and a general device such as a tablet and use them both for different occasions and tasks.

There is a plethora of AAC apps available for tablet devices and mainstream technologies and the number continues to grow. Not all AAC apps are suitable for all AAC users and not all apps are based on evidence. There is a growing bank of resources available for assessing whether an app is evidence based and whether it is suitable for the person who uses AAC. All these AAC devices can help a person to overcome all the existing barriers and will lead them to live a life without any barrier. The can sustain their social status and daily life in the way they want.

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Cybervictimization a Wake-up Call for all Adolescents, Children with Special Needs and each one of us

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Abstract:

Today we cannot imagine our lives without internet connectivity since morning till late in the evening. School going children are also experiencing the same specially the adolescent children. Though they use it to widen their horizons in multiple aspects of life but in that due to unawareness they get trapped into the vicious circle, which is often difficult for them to break without any expert help.

Cyber crime is conducted using computer and internet. It is the crime which is far dangerous than the war with weapons. In today's era it is the data theft which is the cause of concern. Each one of us needs to be aware of cyber security. Since India is transforming to digitization at a faster rate, our youth is far more vulnerable to get entrapped in cyber crimes due to lack of awareness of cyber laws.

Our children fall prey to cyber bullying, cyber stalking, identity theft, online abuse, online gaming threats and what not.

In cases where bullying is moderate and lasts for more than three months, the most commonly used means for it is the mobile phone. "This could be explained by the availability and vital importance that mobile phones have in life. Previous studies have shown that teenagers aged between 12 and 14 have had an average of three Adolescents refer to internet for various aspects, such as to satisfy their queries related to the subject matter and sometimes to gather more and more information about their increasing mental conflict. In that process they need adult supervision as anything that pops up is not to be clicked. The emerging problems that the society is facing are cyber bullying, verbal bullying, invasion of privacy, etc. mobile phones, and 63% of them never switch them off," explains Buelga.

In the current situation we need to take appropriate steps so that youth can be saved from becoming victim of cyber world.

Key words: Adolescent, cyber victim, cyber crime, internet

INTRODUCTION

Online safety for children and adolescents finds itself in a turbulent arena: emerging new mobile and online technologies and applications carry opportunities and risks and constantly bring new challenges. This paper explores particularly the field of adolescents and cyber crime against a background of a culture of control combined with an increasing use of new media by youngsters.

Though studies have been done on internet safety pertaining to adults but the issue has not been taken into consideration with regard to children. Little attention is paid to the fact that adolescents, i.e., youth between the age bracket of 13 to 19, face not only risks but also opportunities in online behavior and that a balance needs to be found between these. Today we must give importance to place anti-cybercrime measures targeted at protecting children and adolescents in the wider context of online safety.

TECHNOLOGY AND ADOLESCENTS

Adolescents use technology to make friends, gather knowledge in various aspects, and try to solve personal issues by keeping their identity secret. They prefer social networking sites to expand their horizons but at the same time this turbulent phase of their life has unsolved mysteries for them. Today facebook, twitter, Instagram, WhatsApp etc. are the social networking modes to keep them inter-connected.They explore new technologies because of the freedom these technologies bring, but it also makes them vulnerable to online crime. The adolescents tend to engage themselves into various forms of cyber crime as Hacking, Pornography, Piracy, and Online hate speech, e-frauds, Identity theft etc. knowingly and unknowingly. Nowadays a significant portion of teenage life is influenced by Social networking sites. According to Das and Sahoo (2011)private and public life in the age of social networking cannot be demarcated. A person becomes helpless to control the misuse and

distribution of his personal data, image or video once it is posted on a website. Even though, people set privacy level but still it is being shared with an unknown web administrator. Using the information available on Facebook profile one can easily determine the physical location of a person. Social

networking sites are becoming a privacy threat to an individual. These sites also biologically impact people as they are immersed in a virtual world of relationships. Another disadvantage of social networking site is that the people who spent a lot of time chatting with friends and browsing profiles divert their mind from other primary work, and it becomes a habit for them to visit their profile several times a day. This problem has become much acute in developed countries and in extreme cases the employees are even sacked. A new type of Internet addiction has emerged called as 'Facebook Addiction Disorder' in which people become addicted to internet. Cyber criminals get help from social networking sites. Victims can be easily lured on social networking sites by pedophiles. The actual identity of anyone in cyberspace cannot be identified and the criminal stake advantage of this. Cyber crimes through social networking sites include posting objectionable content on users' profile, creating fake profiles to defame a person and getting access to someone's profile by hacking. Social networking sites have the power to destroy relationships and can make life miserable. Welsh (2011) calls today's generation "digital natives" or the "i-Generation", a set of studies reveal the psychological and sociological effects of constant networking. Even though studies reveal some of the positive aspects of Facebook such as a shy kid who gets a good experience by building online relationships, but negative traits like narcissism, lack of empathy, increase in aggression and mental illnesses like schizophrenia and depression are also reported due to excessive use of social networking sites. It is observed that online social networking distract adolescents from studies. It results in poor academic performance. Adolescents who are dependent on technology are poor in interpersonal skills. Not only this, but they are unaware that even after removal of photos or information posted, somewhere someone might have saved it online/offline.

ISSUES ON PRIVACY AND SAFETY

Parents believe that problems due to online strangers only happen once in a blue moon because people do not read about it every day in the newspaper. The fact is that children and families who are victims generally do not discuss their personal and painful experiences in society. Adults have a difficult time with the use of Internet because it is a new technology and online crimes magnify the risks associated with the use of technology. Cyberspace is a place, which does not discriminate against race, colour, religion, socio-economic status or gender. Every child online is at some risk. The most effective way to combat the risk is through parental involvement. Kohl highlighted the fact that Cyber bullying results in consequences such as; children to change schools, Drop out of schools, being expelled, charged in civil suits and most important committing suicide. The children who are constantly bullied do not report it because they feel that if they report the incident, the bully may harass them offline or a parent's reaction might be to remove internet privileges. Children need to be taught online manners, just as they are taught everyday manners. Parents should install a "Monitoring device" on the computer. The use of such software is viewed as a way to help adolescents who are tempted through various online means. The privacy issues that need to be taken care of; Cookies, Phishing (Identity Theft), online shopping, frauds and scams etc. They should be told etiquette for the Internet usage, which means following ethical behaviour while being online. People need to follow some guidelines on the net and also teach children how to protect themselves from various forms of online risks.

Children with special needs (CWSN) are assisted to learn using various assisted devices depending upon their level of disability. Here internet usage is again a better way of learning, which intern can be a cause of worry if we do not educate them about careful usage of information technology. They might also become victim of cyber world. Thus not only normal children but even the children who are differently abled are prone to fall entrap of cyber frauds.

CONCLUSION

From the above discussion it is evident that the role of technology is neither good nor bad, it is neutral. It is used as a force to generate energy in society. Nevertheless, cyber crime is the product of technological development. Social networking has become so predominant in our lives because we all are living in "Network Society".We are in touch with the world constantly. Although, a massive literature has been generated on Cyber crime and Social networking sites, still ambiguity persists on the impact of technology and social networking sites on society because still the effect is in the infancy stage and much needs to be done. Indian society has a dearth of relevant literature on cyber crime and social networking sites. It is also noted that very few studies have been conducted and reviewed on adolescents' use of social networking sites in Indian context.

It is a wake up call for all of us to develop policies and measures of cyber worlds for our adolescents. Our youth must be educated the mannerism of technology usage.

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A Pedagogical framework to promote Sustainable Learning: Flipped Classroom Model

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Abstract:

This paper aims to study the potential of Flipped Classroom Model in inculcating the competencies in learners that facilitates long lasting and lifelong learning to achieve sustainable gains and goals. Flipped Classroom Model has emerged as a popular framework over the last two decades. Two important elements of Flipped Classroom Model are self-directed learning and collaborative learning. In this paper the researcher studies the literatures to gain a deeper understanding of how these elements can facilitate the process of attaining sustainable learning. This paper also enumerates the role of technology and digital tools in supporting and enhancing sustainable learning inside and outside the classroom. Findings from the analysis suggest that the self-learning element of Flipped Classroom Model transfers the ownership of learning from teachers to learners. Learners responded positively to the collaborative learning activities carried out as part of Flipped classroom model. This study highlights the need to promote sustainable learning among learners to navigate through the challenges and transformations of this millennium.

Key words: Flipped Classroom Model, Self Learning, Collaborative Learning, Technology Tools, Sustainable Learning

Introduction:

Learners of today are living in a dynamic era where existing knowledge and long believed facts are constantly questioned and updated. Current education system is centered around knowledge accumulation and reproduction. With the advent of smart technologies and search engines like Google, information based education has become irrelevant. In the present scenario knowledge and information on every single topic is available in a few seconds. The challenges and issues that face the 21st century learners are more complex and unique that it needs a different set of skill sets to deal with. Teaching Learning process in today's education system should accept and adapt to the changing needs of the learners and society. The need of today's education is to implement newer ways and techniques that will equip the learners to not just face the present challenges but also prepare them for the unknown future.

Knowledge based learning and assessment does not prepare the learners for the demands of the dynamic needs of the workforce. Constant changes are implemented in all industries and the employees are expected to be flexible enough to self-learn the nuances of the changes and adapt to it without loss of time. Learning is no longer an activity restricted to the time one spends at schools and universities but it is changing into a lifelong activity.

Sustainable Learning:

Sustainable learning encompasses knowledge, skills and predispositions required to support lifelong learning activities

UNESCO (2010)recommends Four Pillars of Learning, which are fundamental principles for reshaping education.

- Learning to Know
- Learning to Do
- Learning to Live Together
- Learning to be

Based on the recommendations of UNESCO, sustainable learning in this paper would mean lifelong and long lasting learning . Sustainable learning is not restricted to content and knowledge but expands to the domain of acquiring skills and competencies to become a lifelong learner. Teaching and Learning methods practiced in schools and universities have to quickly adapt to fulfill this requirement.

Rise of Flipped Classroom Model:

A new paradigm for learning and teaching is required for a variety of reasons, the main one being the challenge to keep pace with the disruptive nature of the changes happening in technology and access to information. Flipped Classroom Model is an innovative teaching technique that reverses the traditional teaching learning practice to provide opportunities to instill in learners the skills to comprehend the complex challenges and contribute in solving the real issues of the present and of the future. Flipped Classroom Model leverages

the benefits on these two changes by providing the learning materials to students before the class to be learnt at home. Students watch these materials at their convenience, playing and pausing at their own pace, without any pressure to keep up with the rest of the class. Thus flipped classroom model supports self-directed learning, where students take responsibility to find their own time, pace and establish a level of engagement and understanding with the content provided.

Classroom time is utilized by the teacher for inquiry and interaction about the content learnt. Teacher engages the students with active learning tasks such as projects, role-plays, debates and problem solving. Students collaborate, inquire and reflect on the concept in the classroom rather than passive listening to the lecture delivered by the teacher.

This paper discusses the concept of FCM and identifies the factors that contribute to sustainable learning drawing on the evidences from the literatures.

Objectives of the Research:

This study has been able to achieve the following objectives:
1. To recognize the need for sustainable learning
2. To enumerate the characteristics of flipped classroom model that promotes sustainable learning

Research Questions:

The study has been able to answer the following research questions:
1. What are the moderators of sustainable learning?
2. What are the main characteristics of flipped classroom model that promotes sustainable learning?

Research Methodology:

Descriptive Research technique was adopted to fulfill the purpose of this study. This method allowed the researcher to consider different definitions, viewpoints and possibilities for the research questions taken up for this study.

Basic features of flipped classroom:
1. Pre-class learning
2. Child centered learning
3. Well crafted learning material
4. Well designed collaborative learning tasks
5. Peer-interaction

Benefits of flipped classroom model:
- Promotes students interaction with the content , peers and teachers
- Provides relevant and meaningful learning experiences
- Provides opportunities to develop meta cognition skills
- Integrates face to face and digital approaches
- Prepares students for the future

Two main components of Flipped Classroom Model are Self directed learning and Collaborative learning.

Self-Direction and Autonomy:

According to Dewey the ultimate purpose of education should be to create continuous learners having the capacity of further educational growth. Garrison(2017) states that self-direction is essential for achieving worthwhile and meaningful educational goals. He also observes that self-directed learning initiates critical thinking and reflective thinking.

Sletten(2015) conducted a study on students' perceptions of the flipped model and their self-learning behaviors. Video lectures do a significant role for self-directed learners who can self-regulate their academic requirement and practices, enabling them to watch, and re-watch if they wish. The dynamic learning practices engage a wider range of students, not only getting them to interact with the learning materials, but also help in fostering 21st century skills through constructive techniques.

Lee & Choi(2019) reported that self- direction significantly influence pre-class learning performance and perceived learning readiness which is an essential component for Flipped classroom model.

Lo & Hew (2017) conducted a study for underperforming and high ability kids and reported that students in both Studies pointed out the needs of additional supports (e.g., Q & A forum) in the video lecture.

One important claim of Flipped Classroom Model is that it inculcates self-learning in learners. Supporting the above claim, Mortensen & Nicholson (2015) mentioned that Flipped Classroom Model (FCM) has the power to stimulate greater learning, especially in undergraduates.

Collaborative Learning in the context of lifelong learning:

Globalisation and technological advancements have brought about a transformation in way people practice their professions or engage in their jobs. Individuals located in different geographies and time zones work together as a team to fulfill a project requirement using modern communication and productive tools. Working together with people who are culturally and demographically diverse is often a challenge. Effective communication becomes an important factor for achieving success in such environments.

Educational institutions should be sensitive to this requirement and try to inculcate good communication skills among learners.

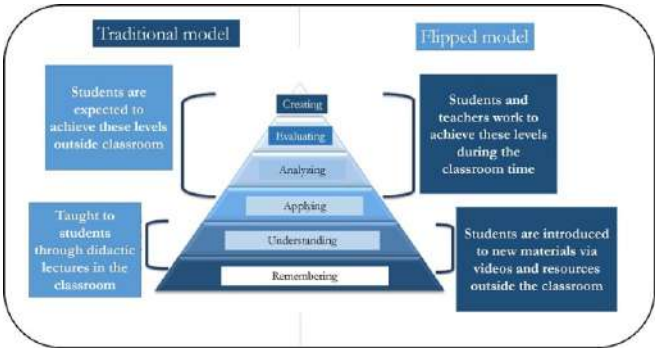
In the traditional learning method, students listened to the lectures in the classroom, read through the materials provided and suggested by the teachers and wrote an exam to show their knowledge expertise. In this whole process there was no scope or very little scope to develop articulation and communication skills. Kahn and Kyle(2002) establishes the importance of communicating ideas in order to demonstrate deeper understanding of concept .

Tasks or assignments that provides opportunities for learners to work in small groups while discussing and sharing each ones ideas promote communication skills. According to Fisher (2009)collaborative learning tasks promotes better learning than individual tasks

One of the most important components of flipped classroom model is the effective use of classroom time to engage students in collaborative learning tasks. Teachers are expected to design activities and tasks that is based on the pre-class assignments. The in class activities should promote communication and critical thinking among students. Students should applythe concepts learnt during their self learning phase in completing the in class tasks

Bloom's taxonomy in Flipped Classroom Model:

Flipped Classroom Model promotes higher levels of cognitive domains provided by Bloom's taxonomy. Applying, Analyzing, Evaluating and Creating



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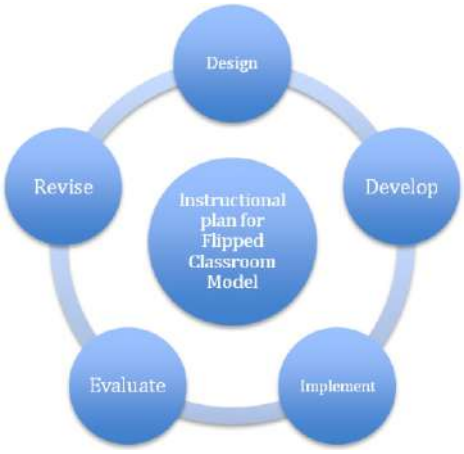
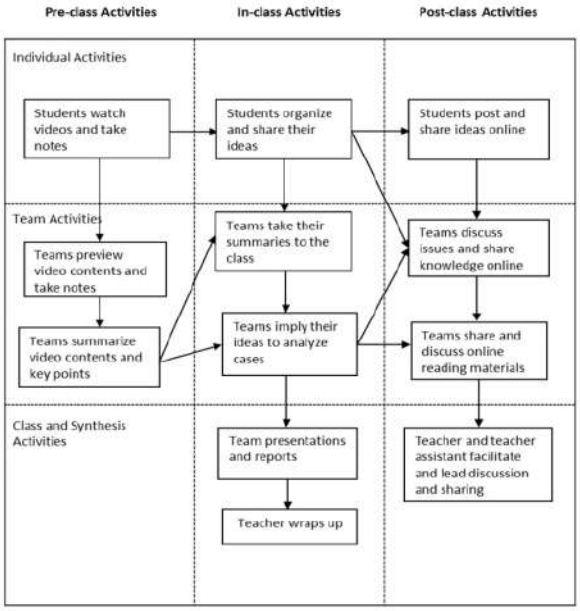
Instructional planfor Flipped Classroom Model:

Bishop & Verleger (2013) defines Flipped classroom as an teaching technique that consist of 2 parts: interactive collaborative learning activities in the classroom, and direct computer-based individual instruction out of the classroom. He emphasis the need to carefully design the in-class activities using the theoretical framework as a guide to design the same.

5 phases of Instructional Design for Flipped Classroom Model:



To effectively design and implement Flipped Classroom model, teachers need to consider the overall curricular objectives, the active learning techniques and be informed of new education technologies. Learning tasks should be designed for both in-class and out-of-class engagement of learners.



(Source: https://www.j-ets.net/ETS/journals/20_1/27.pdf)

Results and Findings:

Kurt (2017) conducted an experimental study on pre-service teachers in Turkey and reported better learning outcomes in the experimental group that was taught using the flipped classroom model. His study also revealed that students of the experimental group had a higher level of self efficacy beliefs and had positive perceptions on the flipped classroom model.

Wever (2017) noted a differential impact on students learning in a Flipped Classroom setting as compared to the students learning in three other learning styes - Blended Learning, Traditional Learning and E-Learning settings. The impact was observed on learning performance, self-efficacy beliefs, intrinsic motivation and flexibility between students assigned to four experimental conditions.

Wulandari (2017) conducted a study on how the implementation of flipped learning helped foster learning autonomy in students. A survey was conducted using a questionnaire created through Google Forms. The questionnaire was designed to find out students' perceptions on Flipped learning model and to what extent the Flipped learning fostered autonomous learning skills in students. The findings showed positive perceptions of students in the way they planned, engaged and evaluated learning independently.

Clark (2015) reported no significant changes in terms of academic performance between the students who were taught through flipped model of instruction and those taught in a traditional classroom environment. However student respondents favoured the flipped classroom model of instruction and experienced an increase in the engagement and communication when the class was conduction in the flipped model.

Hutchings & Quinney (2015) considered Research, Education and Technology as the three major levers of change towards transformation impacting student learning, academic roles and organisational development. The researchers recommend more detailed understanding of beliefs and behaviours of students and staff is needed when introducing and adopting technology based learning practices.

Strayer (2012) found that students in the inverted classrooms were more aware of their learning processes, though he observed that students in the flipped classroom were less satisfied with the way the classroom structure oriented them to the tasks in the course. He defines inverted classrooms as a specific type of blended learning design .

The review of literature suggests that academic research on Flipped Classroom Model is relatively limited at present in India, hence there is a need for further research to evaluate the relevance and effectiveness of Flipped Classroom Model in Indian Classrooms.

Conclusions:

Sustainable Learning requires learners to be prepared for lifelong and long lasting learning. Flipped Classroom Model through its two important components namely self directed learning and collaborative learning has the necessary characteristics to promote sustainable learning. Students responded positively to collaborative learning tasks carried out as part of flipped classroom model. Self directed learning improves ownership and responsibility of the students in the learning process.

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Developing Effective Teachers through Digital Initiatives: An Indian Experience

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ABSTRACT

Technology helps frog-leap stages of development. People and areas which remained out of reach of development have crossed intermediary stages of development through digital initiatives. In India, digital initiatives in education sector have set global examples. In year 2004, India had launched an Educational Satellite (EduSat) which was dedicated for education, an initiative which no other country in the world could emulate. The EduSat is a good case in point from which we all can learn important lessons.

Similarly, in year 2017, Government of India (GOI) launched its own Massive Open Online Course (MOOC) platform by the name SWAYAM which today is the largest MOOC platform in the world. A massive Diploma in Elementary Education (D. EI. Ed) program by the National Institute of Open Schooling (NIOS) was offered through the SWAYAM platform. More than twelve lakh un-trained in-service teachers were provided training through the four quadrant MOOC courses. This was a paperless course, offered completely though this digital platform. A similar initiative by the name Swayam Prabha, a bouquet of thirty two direct to home (DTH) channels were launched in the same year by the Ministry of Human Resource Development, GOI. This enabled a 24x7 lecture support for teachers, including regional languages, through Vagda channels of the Swayam Prabha platform. All these initiatives have resulted in developing effective teachers through the digital initiatives in our country. It can be confidently mentioned that these initiatives will reap positive outcome in the Elementary education in India in the coming years. The author as a member of the Academic Advisory Committee (AAC) of SWAYAM Board for school and teacher education, has been part of the decision making process for digital initiatives. This paper aspires to unfold various aspects of the digital initiatives for developing effective elementary teachers in various states of the country and offers recommendation for the enhancement and Upgradation of these platform for building up Quality Resources .

INTRODUCTION

Teachers are considered next to Gods in our country. It is rightly said that teachers build Nations by churning out generations of students who then go on to build not only their society and community but also their nation. Hence, teachers need to be highly effective in their teaching and need to continuously embrace new technologies to make their teaching interesting and easily comprehensible to their students. Technological advancements in the education system is not only the need of the hour but has now become a top priority for a developing country like India, which is on the path of progress and development. To ensure proper and smooth outreach of educational objectives in a geographically large and culturally diverse country like India is certainly a daunting task. Inadequacy of infrastructure in rural areas and paucity of effective and good teachers have been the major hurdles hampering the quality of education. But now technology has come to the rescue in this all-important area.

With the aid of technology, we are ushering in an era of universal education and the same technology has also helped in producing effective teachers. Technology helps frog-leap stages of development. People and areas which remained out of reach of development have crossed intermediary stages of development through digital initiatives. In India, digital initiatives in education sector have set global examples. The researcher has tried to highlight the various digital initiatives of the government in the recent past which have not only provided wider access to Indian students to world class education but has also given an opportunity to the teachers to become more effective in their teaching through these digital initiatives. However the question which still remains unanswered is ….. Are these resources accessed by all?

India is going to be the youngest country by 2020 with 65% of population in working age group. We have around 1.5 million schools with over 150 million students, 750 universities & 35000 colleges. Teacher efficacy remains vital if we are to seek qualitative improvement in the quality of education being imparted to the students. This paper focuses on digital initiatives undertaken by the government in the recent past and how they have helped in the overall academic growth of the teaching community.

BACKGROUND

To properly understand the present scenario of Information and Communication Technologies (ICT) especially in education, we will need to go into the growth and development

of ICT in India along with the global developments. During the 1980's communication technologies grew rapidly in India. The television reached all parts of the country. The trigger was the Asian Games of 1982 which were organised in New Delhi and the telecast of the games reached every household across the country. This was the first milestone in the utilisation of ICT in India.

During the same period, computing technology was the focus of research in the West and in the Indian universities department of Computer Science was being established. By the end of the 1980's Indian Computer Scientists had started arriving at the Silicon valley and very soon their talent was recognised. India now had the two most important components required to go digital, namely communication technology and human resource to handle the large databases.

In year 1990, the World Bank organised an important meeting popularly known as Universalization of Elementary Education (UEE) meeting at Jomtien (Thailand) to discuss the growing illiterate population in the world, of which two thirds was residing in South Asia especially India, Pakistan and Bangladesh. India participated in this conference and also signed the declaration. Since 1990's the focus of education in India shifted from higher education to school education. As a consequence, the District Primary Education Program (DPEP) was started in India. However, in the year 2000, India discontinued the DPEP and started its own version of UEE by the name Sarva Shiksha Abhiyaan (SSA). By this time we had already witnessed the arrival of networked computers and communication through network. Computers were connected through optical fibre and we could make use of resources created at one location for transferring information to another location in a few seconds. Emailing became available by in the 1990's.

By the year 2000, it was realised that if we were to develop quality education in a large and diverse country like India, we would have to harness the potential of ICT, especially satellite communication, to reach every nook and corner of the country. It was thus decided to launch a satellite fully dedicated to education.

EDUCATION SATELLITE (EDUSAT)

EDUSAT was an educational initiative of GOI which was started with an aim to connect elite educational institutions in cities with its counter parts in rural India. EDUSAT was a communications satellite which was launched in 2004 by the Indian Space Research Organisation (ISRO). This satellite, unlike its predecessors, was built exclusively to serve the education sector. It acts as a bridge between the so called elite educational institutions offering quality education in the urban areas & metros and the educationally deprived remote areas of the country. The intent behind the launching of this satellite was to cater to the demand of an interactive satellite-based distance education system in India. This initiative not only led to transmission of knowledge to far flung & difficult areas but also enlightened the people on issues pertaining to health hygiene, wellness, farming & development of all-around personality required to lead to success & healthy life. EduSat has encouraged active learning and has tremendously helped in enriching the existing curricular.

EDUSAT has a total of seventy-two channels, out of which fifty-six channels are dedicated to formal education. It offers literacy, syllabus-based education, training and enrichment which cover all sectors of education i.e. primary to higher, professional/ technical etc. in all regional languages and all types of students (normal/ disadvantaged/ women/ tribal/ specially abled). Another sixteen channels cover programmes directed towards education of elderly, youth, women, science & technology, culture & heritage, health, literacy, Indian languages, etc.

EDUSAT has also played an important role in training of teachers and making them more effective. It has endeavoured to familiarize the teachers with the modern ICT and its uses in teaching. It has helped teachers in content development, content enrichment, providing access to resource persons and train them to use 'education digital video library'.

NATIONAL DIGITAL LIBRARY

"National Digital Library" (NDL) is another appreciable initiative by the GOI for the teaching community as well as for the students. It is managed by the Indian Institute of Technology, Kharagpur. Ministry of Human Resource Development (MHRD) under its "National Mission on Education" through ICT initiated the NDL project to develop a framework of virtual repository of learning resources with a single-window research facility. The NDL is a vast digital library catering to the needs of various segments of the society which includes teachers, students, professionals, lifelong learners etc. The NDL has content from various fields such as Science, Humanities, Technology etc with more than sixty types of research material such as books, video lectures, articles etc. This content is not only available in English and Hindi but also in seventy different languages. Though this initiative has been launched less than a year ago, it has already shown immense potential it holds in providing the necessary impetus for the growth of the teachers.

E-PATHSHALA

As the name suggests, E- Pathshala is also an ICT initiative undertaken jointly by the MHRD and the NCERT. It has basically been developed to promote the use of ICT in the teaching learning process. Under this programme, educational e resources such as textbooks, audio, video, periodicals etc. are made available both for the teacher as well as the taught. There is no doubt that such an initiative not only has immense benefits for the student by providing browsing and downloading academic material from the ease of his/ her home but also provides plethora of reading material to the teacher as well. Besides this, teachers can also access teaching instructions and source books and can also help their students achieve the expected learning outcomes. The teachers can also access reports of committees, policy documents, syllabus, images, maps, audios, videos etc. which would go long way in

increasing the effectiveness of the teacher. Indeed, another splendid digital initiative by the government towards teacher efficacy.

SWAYAM

SWAYAM or 'Study Webs of Active Learning for Young Aspiring Minds' is another wonderful digital initiative undertaken by the Government of India for the betterment of the students as well as the teachers. The journey of SWAYAM can be traced back to year 2003 with the initiation of the National Programme on Technology Enhanced Learning (NPTEL), a joint programme of IITs and IISc. This was the first major attempt in E-learning in the country through online Web and Video courses in Engineering, Science and humanities streams. The main aim of this initiative is to provide the best teaching learning resources to everyone, be it students who could afford resources or disadvantaged students who are not in a position to afford the scarce educational resources. This seems to be an excellent digital initiative by the government to reach out to those sections of the society who otherwise could not have dreamt of accessing the material provided at the SWAYAM platform and would have otherwise remained out of the ambit of knowledge economy. The courses hosted on SWAYAM are in 4 quadrants:-

(a) E-tutorials as Audio/Video lecture.

(b) E-text in the form of PDF as specially prepared reading material that can be downloaded/ printed.

(c) Self-assessment tests through tests and quizzes.

(d) Online discussion forum for clearing the doubts. Steps have been taken to enrich the learning experience by using audio-video and multi-media and state of the art pedagogy / technology.

This initiative basically aspires to achieve access, equity and quality which happen to be the cardinal principles of our education policy. With initiatives like SWAYAM we seem to be moving from the philosophy of 'bringing people to learning' to taking 'learning to people'. Such a technology carries with it the great advantage of being available anywhere and anytime. The traditional constrains of learning in a specific time zone and place are now things of the past. Again, such an initiative not only benefits the students but it goes a long way in improving the efficacy of teachers as well. This platform provides an excellent opportunity to teachers to access the material available at the SWAYAM platform and incorporate it in their teaching. The course modules on the SWAYAM platform have been developed by the best available faculty in different subjects, as such the content could be made use of by any teacher to improve himself further in all aspects. Today SWAYAM is the largest MOOC platform for the world. Diploma in Elementary Education (D. EI. Ed) program by the NIOS was offered through the SWAYAM platform. More than twelve lakh un-trained in-service teachers were provided training through the four quadrant MOOC courses. This was a paperless course, offered completely though digital platform. Thus, it is clear that this digital initiative of the government of India has certainly proved a milestone as far as development of effective teachers is concerned.

SWAYAM PRABHA

SWAYAM PRABHA is yet another excellent initiative by the GOI to reach out to the student community and the teachers as well. The SWAYAM PRABHA is a group of thirty-two Direct to home channels devoted to telecasting of high-quality educational programmes twenty-four hours a day. For this purpose, GSAT-15 satellite is used. Normally, there is addition of fresh matter for at least four hours which would be frequently available five more times in a day, permitting the scholars to choose the time which suits them as per convenience. The channels are uplinked from Bhaskaracharya Institute for Space Applications, Gandhinagar. The content is provided by National Programme on Technology Enhanced Learning (NPTEL), Indian Institute of Technologies (IITs), University Grants Commission (UGC), CEC, Indira Gandhi National Open University (IGNOU), National Council for Educational Research and Training (NCERT), Consortium for Educational Communication (CEC) and National Institute of Open Learning (NIOS). As far as its usefulness for the Teachers is concerned it has various modules for teacher training which can be availed of by any teacher willing to hone his/ her skills thereby helping in making him/ her even more effective. Ultimately, the efficiency directly benefits students who reap the benefits for a lifetime.

CONCLUDING OBSERVATIONS & SUGGESTIONS

As has been rightly said, the future generations are made in schools and colleges and it is these students of today that are going to become our Doctors, Lawyers and Scientists of tomorrow. In this context it goes without saying that the responsibility of nurturing these future leaders lies on us, the Teachers. For the achievement of this noble objective, we have to equip our teachers with the best possible means, so that not only does it increase their efficacy but it also helps them realise their potential to the maximum. The digital initiatives mentioned in this paper are a step in the right direction by the GOI. These initiatives and many more which are in the pipeline will certainly go a long way in the fulfilment of the dual objective of making our teachers more effective and will also ensure that technology reaches even the underprivileged students who would otherwise not be able to afford it due to monetary and space constraints. The researcher has certain suggestions to add in the context of the digital initiatives as discussed in the paper. Some of these suggestions are:-

(a) EDUSAT has been created as a platform of government monopoly. Its usage, even in government schools, has been sub optimal. Thus, there is a need to adopt a three pronged strategy to increase usage of EDUSAT. This can be achieved through greater involvement of private educational institutions in designing updated content for teachers and students; devoting at least 30% channels on Edusat on teachers' training; collaboration with foreign academic partners so that international faculty / resources can be used and need to

increase viewership of Edusat channels by relaying these channels via DTH (direct to home)/ cable TV tie-ups, so that teachers can access it in their homes for updating teaching skills.

(b) Make teachers ICT enabled. We find that in remote areas, teachers still hesitate to adopt ICT whole heartedly due to their own inefficiency in IT skills. At present they are unable to harness the benefits of these platforms optimally. It is only a generation of IT inclined teachers which will reap the maximum benefits of these initiatives. So ensuring adequate benchmarking of IT skills and a love for technology has to be developed. In this regard adequate incentives to those who have made full use of these platforms.

(c) The teachers can also be asked to share the links in the lesson plan prepared by them. It should be made imperative for them to access information from these IT portals & platforms and incorporate them into their teaching plans. Free Wif-Fi facility should be provided to all teacher education institute, schools & colleges for the teacher to be able to access internet freely.

(d) National Digital Library, though a good initiative, remains a half-baked attempt at creating digital knowledge repository. Government has taken the short route of aggregating already available digital resources. Almost all material available on NDL is freely available online. Government must use NDL to provide free access to teachers and students of reputed research material which is otherwise restricted through paid journal memberships.

(e) SWAYAM and SWAYAMPRABHA, though are good and appreciable initiatives launched by the GOI, yet they could be refined further by undertaking a study in finding out their shortcomings and grey areas.

The recommendations made in the study could be made use of to improve the efficacy of teachers which will accelerate & amplify the knowledge economy.

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A Comparative Study on the Accomplishment of Sociable Skills among Children with Intellectual Disabled attending Special School and Children Inclusive School

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Abstract

This is research work is an attempt to compare the accomplishment of sociable skills among children with Intellectual disabled attending Special School and children attending residential special schools was conducted. Survey method was carried out for the collection of data. The size of the sample was 50 children with Intellectual disabled (25 attending Special School and 25, attending residential special schools.) residing in West Tripura district of Tripura. Sociable skills rating scales (Gresham & Elliot, 1990) was used by the researcher to measure the Accomplishment of sociable skills. Data were analyzed by using descriptive statistical technique like mean, SD and t –test. The findings of the study indicated that there was no significant difference in the accomplishment of sociable skills of children in Special School compared to residential special schools. No significant relationship was found between sociable skills accomplishment and age, gender and type of family of children with Intellectual disabled. Further comparison of accomplishment of sociable skills indicated a higher accomplishment in attachment domain and a low Accomplishment in Initiation domain in both the groups of children.

Key Words: Intellectual disabled, Accomplishment, Sociable Skills, Special School

Introduction

Sociable skills are complex abilities one needs to adjust to changing sociable demands. They depend on the specific sociable context .Sociable skills are the skills needed to interact adaptively in our cultural environment. According to Earledge and Milburn (1980), sociable skills are defined as those sociable, inter-Personal and task related behaviors that produce positive consequences in the school classroom setting.

Sociable skills are described as those skills such as greeting others, gives smiles, interact with others, and share toys, turn taking, and follow simple rules of the game. Sociable skills and the ability to get along with others are just an important to the handicapped students as they are the non-handicapped student. In fact, these sociable skills are even more critical to the person who is handicapped because the handicapped are often compared with the norm and must compete for grades, sociable status and employment. The importance of sociable competence and related personality features has been stressed for individuals who have Intellectual disabled or other developmental disabilities. Children with Intellectual disabled differ in their physical abilities, communication skills and sociable backgrounds and above all in their intellectual capabilities. These factors in one way or the other way affects their sociable interaction and ultimately determine their sociable adaptation level. Due to their deficits in adaptive behavior the children with Intellectual disabled are less socialized. Sociable skills impairments are usually reflected in at least one of the three areas, including the level of a child's sociable interaction skills, the development and stability of peer relationships and friendships, and a child's ability to process sociable and Residential School. The level of sociable mal adjustment may be related to the severity of cognitive impairment, co-occuring Psychiatric conditions and the differences in behavioral phenotype associated with specific etiologies .Individuals with Intellectual disabled have been classified by the degree of intellectual impairment as mildly ,moderately severely or profoundly mentally retarded Sociable skills deficits of children with mild Intellectual disabled may be very subtle., and inter personal behavior may appear similar to that of normally developing children .One of the early findings is that children with Intellectual disabled initiate fewer sociable interactions and demonstrate fewer responses topeers than do normally developing children

Children with Intellectual disabled show little developmental change in peer interactions. However, increases in the amount of sociable behavior over time were found in children with mild, but not severe ,Intellectual disabled (Guralnick & Weinhouse,1984). Heron and Harris (2001)suggests that for many students with special needs, the development of appropriate sociable skills improve their chances of gaining sociable acceptance and succeeding when they are included.

The aim of the study is to compare the Accomplishment of

sociable skills of children with Intellectual disabled attending Special School and children attending Inclusive School. Which will helps to understand the training for children with Intellectual disabled should be started very early in life. The family, the relatives, neighbors, friends and the society at large are responsible for the sociable skill Training of the persons with Intellectual disabled.

Objectives of the Study:

I. To compare the accomplishment of sociable skills among children with Intellectual disabled attending regular special schools and children attending residential special schools.

II. To find out the relationship between accomplishment of sociable skills with age, gender, level of retardation and type of family of children attending regular special schools.

III. To find out the relationship between accomplishment of sociable skills with age gender, level of retardation and type of family of children attending residential special schools.

Hypothesis of the Study:

- There is no significant difference in the accomplishment of sociable skills of children with Intellectual disabled attending Special School and children attending residential special schools.
- There is no significant difference between the accomplishments of sociable skills with respect to age of children with Intellectual disabled.
- There is no significant difference between the accomplishments of sociable skills with respect to gender of children with Intellectual disabled.
- There is no significant difference between the accomplishments of sociable skills with respect to type of family of children with Intellectual disabled.
- There is no significant difference between the accomplishments of sociable skills with respect to level of retardation of children with Intellectual disabled.

Methodology Research design: Survey method was used

Sample: The sample consisted of 50 children in whom 25 children with Intellectual disabled are from residential special schools and 25 children from regular special schools. Characteristic of the sample were children with mild and moderate Intellectual disabled with age ranging from 7-15 years. The sample was drawn from residential special schools and Special School situated in west Tripura districts.

Sampling Techniques: Non probability; Convenience sampling technique was used.

Tool: The sociable skills rating scales SSRS (Gresham & Elliot, 1990) was used for assessing the Accomplishment of sociable skills. The SSRS is a frequency rating scale.

There are six domains in the SSRS Checklist. They are attachment domain, Interaction domain, Initiation domain, Co-operation domain, Self-management domain and Sociable play domain. The SSRS consists of Part A and Part B. The first part (Part A) of SSRS contains the demographic details of the children with Intellectual disabled .It includes the details of child's age, gender, Level of retardation, type of school/and number of siblings. Part B of the SSRS consists of six domains –The attachment domain consists of 15 items, Interaction domain consists of 29 items, Initiation consists of 5 items, Co-operation domain consists of 12 items, self management consists of 11 items and sociable play domain consists of 10 items. The sociable Skill rating scale is a three point rating scale –Always (2), Sometimes (1), and Never (0) always.

Procedure: The researcher personally contacted the special schools authorities' .The scope and purpose of study was explained to them and their permission was sought for collecting data from students, teachers and care takers. The researcher collected information by direct observation and information provided by teachers and care takers.

Data Analysis: The collected data was analyses with respect to a number of background variables.

The following statistical techniques were used for this purpose. Computation of arithmetic mean, Computation of SD and Computation of t-test

Results & Discussions:

In the present study A Comparative Study on the accomplishment of Sociable Skills among Children with Intellectual disabled Attending Special School and Children Attending Residential Special Schools .Data were analyzed by using descriptive statistical technique like mean, SD and t –test. In result and discussion and only significant result has been shown in table and figure followed by the formulated null hypothesis. All the result and discussion are given below.

Hypothesis-1: There will be a significant difference in the Accomplishment of sociable skills among children with Intellectual disabled attending Special School and children attending residential special schools.

Table-1: Comparison of Accomplishment of sociable skills among children attending Special School and children attending residential special schools.

Type of service	N	Mean	SD	t-value	Significance
Regular special Schools	25	66.6	11.4	-.85	p>0.05
Residential special Schools	25	68.35	9.6	(Df=98)	

Table -1 show the mean scores in sociable skills accomplishment among children attending Special School and children attending residential special schools. The mean scores of accomplishment in sociable skills for regular special school

is 66.6 and residential special school is 68.35, the t-value is -0.848.The obtained t-value is lesser than the table value which indicates that no significant difference was found in sociable skills Accomplishment among children attending Special School and children attending residential special schools. Therefore the findings are in accordance with hypothesis.

Figure.1. Figure showing the comparison of accomplishment of sociable skills among children attending regular special schools and children attending residential special schools

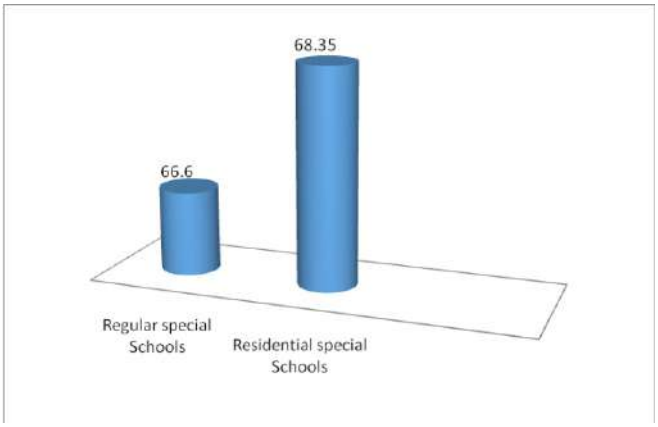


Figure1 shows that the mean accomplishment scores in sociable skills are high in children who are attending residential special schools. The mean score of the children attending Special School are 66.6 and for residential special schools are 68.35. There is slight difference in the mean scores. The result of the study shows that there is no significant difference in the accomplishment of sociable skills in children attending residential special schools and children attending regular special schools. The results of the study support the findings as stated that the family is the most influential context of the development of sociable emotional development in children in early childhood.

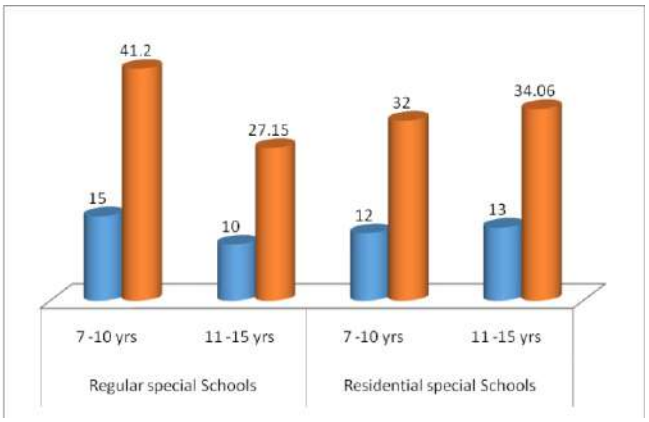
Hypothesis-2: There will be a significant difference in the accomplishments of sociable skills with respect to age of children with Intellectual disabled attending Special School and children attending residential special schools.

Table 2: Comparison of accomplishment of sociable skills among children with respect to age of children with Intellectual disabled attending Special School and children attending residential special schools.

Type of service	N-50	Age		Mean	SD	t-value	Signi-ficance
Regular special Schools	25	7 -10 yrs	15	41.20	11.4	-.85	p>0.05
		11 -15 yrs	10	27.15			
Residential special Schools	25	7 -10 yrs	12	32.00	9.6	(Df=98)	
		11 -15 yrs	13	34.06			

Table -2 show the mean scores in sociable skills accomplishment among children with respect to age of children with Intellectual disabled attending Special School and children attending residential special schools. The mean scores of accomplishment in sociable skills for regular special school 7 -10 yrs is 41.20 and 11 -15 yrs is 27.15 and residential special school 7 -10 yrs is 32.00 and 11 -15 yrs is 34.06, the t-value is -0.848.The obtained t-value is lesser than the table value which indicates that no significant difference was found in sociable skills accomplishment among children attending Special School and children attending residential special schools. Therefore the findings are in accordance with hypothesis.

Figure.2. Figure showing the comparison of accomplishment of sociable skills among children with respect to age of children with Intellectual disabled attending regular special schools and children attending residential special schools



Hypothesis-3: There is no significant difference between the accomplishments of sociable skills with respect to gender of children with Intellectual disabled.

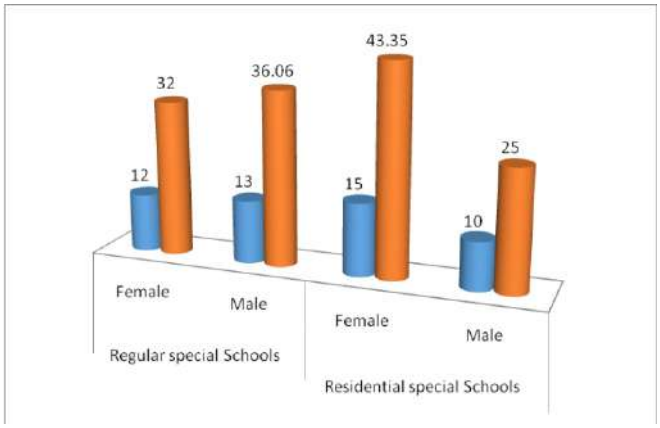
Table -3: Comparison of accomplishment of sociable skills among children with respect to gender attending Special School and children attending residential special schools.

Type of service	N-50	Gender		Mean	SD	t-value	Signi-ficance
Regular special Schools	25	Female	12	32.00	11.4	-.85	p>0.05
		Male	13	36.06			
Residential special Schools	25	Female	15	43.35	9.6	(Df=98)	
		Male	10	25.00			

Table -3 show the mean scores in sociable skills accomplishment among children with respect to gender attending Special School and children attending residential special schools. The mean scores of accomplishment in sociable skills for regular special school female is 32.00 and male is 36.06 and residential special school is female is 43.35

and male is 25.00, the t-value is -0.848.The obtained t-value is lesser than the table value which indicates that no significant difference was found in sociable skills accomplishment among children attending Special School and children attending residential special schools. Therefore the findings are in accordance with hypothesis.

Figure-3. Figure showing the comparison of accomplishment of sociable skills among children with respect to gender attending regular special schools and children attending residential special schools



Hypothesis-4: There is no significant difference between the accomplishments of sociable skills with respect to type of family of children with Intellectual disabled.

Table-4: Comparison of accomplishment of sociable skills among children with respect to type of family attending Special School and children attending residential special schools.

Type of service	N-50	Attending School		Mean	SD	t-value	Signi-ficance
Regular special Schools	25	Nuclear	12	32.00	11.4	-.85	p>0.05
		Joint	13	34.06			
Residential special Schools	25	Nuclear	10	32.10	9.6	(Df=98)	
		Joint	15	36.25			

Table -4 show the mean scores in sociable skills accomplishment among children with respect to type of family attending Special School and children attending residential special schools. The mean scores of accomplishment in sociable skills for regular special school nuclear family is 32.00 & joint family is 34.06 and residential special school is nuclear family is 32.10 & joint family is 36.25, the t-value is -0.848.The obtained t-value is lesser than the table value which indicates that no significant difference was found in sociable skills Accomplishment among children attending Special School and children attending residential special schools. Therefore the findings are in accordance with hypothesis.

Figure.4. Figure showing the comparison of accomplishment of sociable skills among children with respect to type of family attending regular special schools and children attending residential special schools

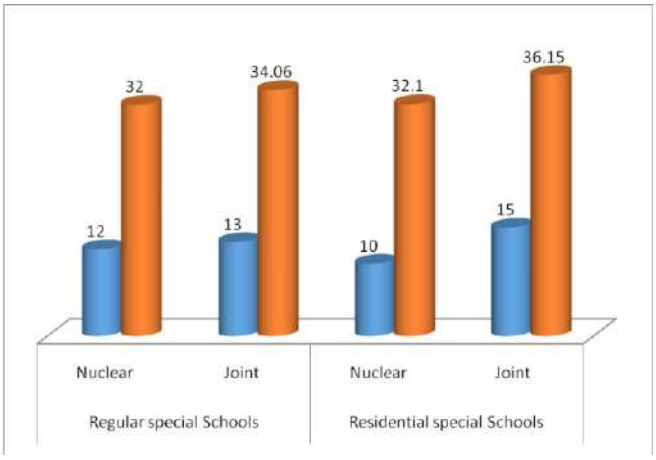


Table: 4 Mean accomplishment scores in sociable skills of children with Intellectual disabled with respect to level of retardation.

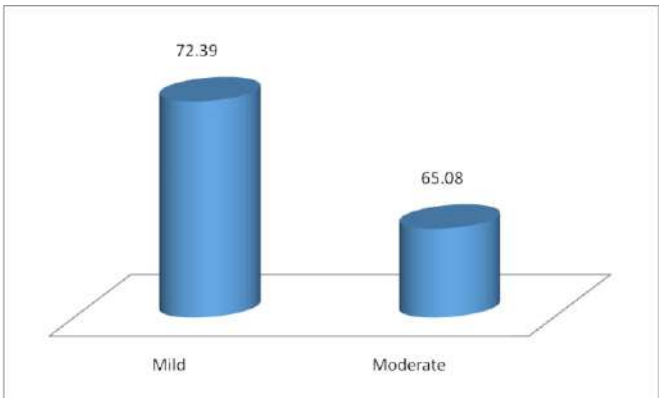
Hypothesis 5: There will be no significant difference between the accomplishment of sociable skills and level of retardation of children with Intellectual disabled

Table -5: Accomplishment scores on sociable skills of children with Intellectual disabled with level of retardation

Sl. No	Level Retardation	N	Mean	SD	Tvalue	Significance
1	Mild	25	72.39	8.49	t=1.72	P<0.01
2	Moderate	25	65.08	10.66	Df=98	

The above table shows the mean, SD, and t-value of sociable skills of children with Intellectual disabled with respect to their level of retardation. The t-value is 1.72 with 98 degree of freedom .The calculated t-value is higher than the table value. Therefore there is a significant difference in the accomplishment of sociable skills among children with Intellectual disabled with respect to level of retardation. Children with mild Intellectual disabled have higher ability to understand and act accordingly than children with moderate Intellectual disabled. Results supports the findings as stated by Matson et al (2000) who stressed that significant differences were observed in sociable skills of children with mild Intellectual disabled and moderate Intellectual disabled.

Figure 5 shows the accomplishment scores on sociable skills



of children with Intellectual disabled with respect to level of retardation. The mean score of children with mild Intellectual disabled is 72.39 and children with moderate Intellectual disabled is 65.08.The figure shows the level of retardation is a factor for influencing the Sociable skills development of children with Intellectual disabled. Children with mild Intellectual disabled have higher ability to understand and act accordingly than children with moderate Intellectual disabled. Children with mild disability has IQ range 50-70.mild children can achieve academic and sociable skills like other children. The results supports the findings as stated that who stressed that significant differences were observed in sociable skills of children with mild Intellectual disabled and moderate Intellectual disabled.

Conclusion:

The present study has revealed that there is no difference in the Accomplishment of sociable skills among children with Intellectual disabled attending Special School and children attending residential special schools. This may be due to the positive environment in schools which foster sociable skills in children. Peer interaction is high in both schools.

There are many reasons for increasing sociable skills. It may be due to the relation between peers and other children, their neighbors, parents etc. But over protection of parents and others may lead to a decrease in sociable skills. Others positive attitude towards the children also will result in increase of sociable skills. The present study will help to understand the level of sociable skills of children studying in day care and residential special schools.

Education Implication:

The present study findings will help the teachers and professionals, in planning and developing a sociable specific curriculum. Further the results will give directions to parents and teachers to focus on sociable skill development in children along with other academic activities.

Limitation and Further Direction:

The results cannot be generalized as the sample is not representative of whole population. Further research needs to be done in a layer sample from different part of the country.

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A study to analyse the impact of E- Appointment system on waiting time and patient satisfaction at Rehabilitation Center

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Abstract :

Aim: The aim of the research is to study the impact of E-appointment system on waiting time and patient satisfaction at rehabilitation center**. Research Methodology: Cross Sectional Descriptive study**. **Sampling:** Random sampling , patient attending Speech and Audio Clinic at Ashtavakra Rehabilitation Center . Sample Size of 100 Patients. Data Collection: Data collection is done through structured questioner. **Data analysis**: the data is analyzed using SPSS Version 21. **Result:** With the help of E appointment System Health Care administrator can overcome the problem of the appointment load and can efficiently schedule the appointment by reducing the waiting time and increasing the patient satisfaction. **Conclusion**: E appointment system has increased the patient satisfaction by reducing waiting time at Ashtavakra Rehabilitation Center. The waiting time of respondents has reduced by 24.7 minutes on average after its implementation. (95% CI [23.05, 26.36] , ($t_{99} = 29.69, p < 0.001$).

Key words: Waiting Time, Appointment system, Queue system, scheduling system, patient satisfaction

Introduction

With the increasing population, there has been proportionate increase in the number of patients seeking medical care. Delhi a largest metropolitan city,the fifth most populous city in the world known for possessing the advance medical health care facilities is also facing this health care load due to increasing population. (Currently as per census 2019 Delhi population is 1.90 Cr) .

In Delhi the medical facilities are availed both by the resident of the Delhi and NCR. In addition, residents of neighboring states travel to Delhi for seeking medical care, which is a very common practice. Due to increasing number of new patient, there is a need for up gradation of the processes and procedure by the health care administrator to distribute the health care load with the help of advancement in Information, Communication and Technology to assist the patients in the efficient manner.

To serve the patient efficiently the fore most steps what needs to be taken care of is the appointment scheduling. Appointment scheduling is the most important task, which need to be addressed since the increase in the patient load directly affects it and leads to long waiting hours for availing the medical facility and add on to the patient discomfort and dissatisfaction.

Today in the era of technology where almost every service is connected through web, Introduction of e-appointment system and its modules have made the patient appointment scheduling process easier and efficient by eliminating the queues ,improving staff productivity, reduce patient complaint, reduce no show and improve experience for both health care administrator and the patients cost effectively.

This research is designed to analyses the impact of e-Appointment System on waiting time and patient satisfaction at Rehabilitation center .

Ethical committee: Ashtavakra Rehabilitation Center Ethical Committee approved the study and allowed for collection of data and for its utility in the research study.

Abbreviation

ARC Ashtavakra Rehabilitation Center

EC Ethical Committee

REVIEW OF LITERATURE:

Patient satisfaction is deemed one of the most important factors, which determine the success of health care facility (Joshi 2013).Patients' satisfaction with appointment booking is influenced by their ability to book at the right time with the right health service providers(Gupta D2011).

Since patient satisfaction is directly linked to the length of waiting time and its experience booking the appointment, Health care provider had tried to meet up the expectation for providing the hazel free appointment and consultation with minimum waiting with the help of E appointment system.

E appointment system also called as online scheduling system is the web based application developed to increase the patient

satisfaction by helping them to book appointment conveniently through web connected device with an instant booking without any human intervention.

E appointment have benefits for everyone involved in the scheduling process, as health care administrators , health care provider which not only help in conducting their tasks more efficiently and accurately but also help patient to book their appointments quickly and more conveniently thus adding to the positive experience .(Appointment-Plus, 2012)

E- appointment scheduling has been found extremely important and most acceptable feature through various research surveys and most patients expressed to avail this service again. Zhang(2012)

Model Of E- appointment System

Features of E- appointment system:

- Patients take appointments in real-time without visiting clinic.
- Patients can choose any available time slot for a particular doctor.
- Patients can cancel their appointment at any time .
- Patients get sms notifications for every successful appointment booking or cancellation. Patient get scheduled reminder alerts for appointment booking.
- Patient information is stored on cloud and can be viewed by doctor .
- Patient can book appointment online without visiting clinic
- Patients can book appointment online at any time and from anywhere.
- patients don't have to visit clinic for booking an appointment. This saves their time and money both.
- Patients don't have to wait in long queues for their turn.

Diagram 1 : Features of E- Appointment System

Mode of Appointment

Various appointment mode are being used for booking appointment in health care sector. The conventional appointment scheduling system uses the most common mode i.e. Walk In and telephonic appointment booking, Both of these appointment mode are time consuming and involve human intervention. On the other hand appointment mode has enhanced after introduction of e-appointment system. It has added booking of appointment through web enabled device, through android application and web linked kiosk.

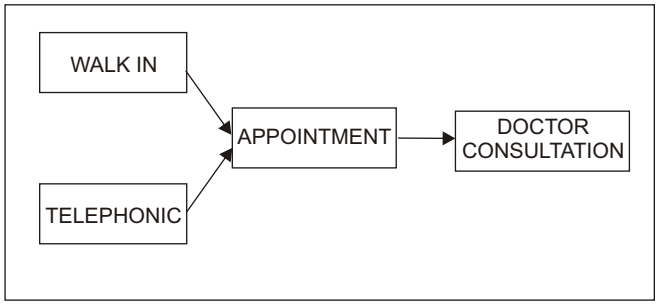


Diagram 2 : Appointment mode before implementation of e-appointment system

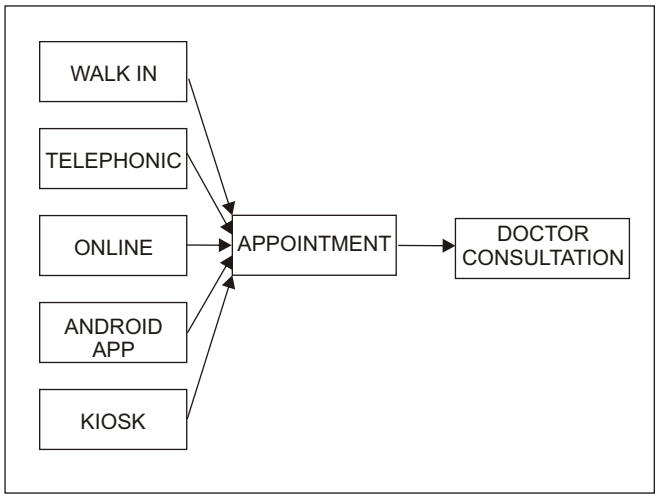


Diagram 3 : Appointment mode after implementation of e-appointment system

Aims:

The aim of the research study is to analyses the impact of e-Appointment System on waiting time and patient satisfaction at Rehabilitation center .

Objective:

To study the impact of E appointment system on waiting time and patient satisfaction at Ashtavakra Rehabilitation Center.

To suggest the changes based on the feedback of the patients for further improvisation of the appointment system.

Research Methodology: A Cross Sectional Descriptive study

Place Of study: Sample collection done at Ashtavakra Rehabilitation Center (A super Specialized Center for Hearing and Speech) .

Duration of Study: One Month .Period Of Survey: 1 May 2019 to 31st May 2019

Sampling Technique: Random Sampling. Patients visiting Ashtavakra Rehabilitation Center during the period of survey except those who were critically ill.

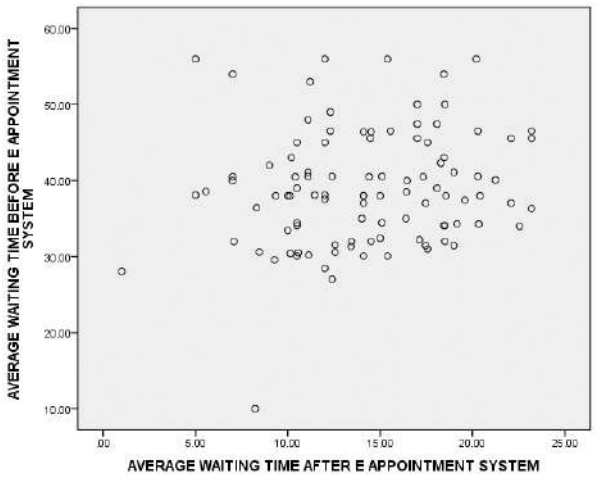
Sample Size : The research study has been undertaken on 100 samples (patients visiting for speech therapy at Ashtavakra Rehabilitation Center) randomly irrespective of their age, sex , qualification , income out of the with 95 % level of confidence Interval and 5 % margin of error .

Data Collection Tool: Data collection is done through a structured questioner. This questionnaire to collect data is self-developed and to ensure validity of its content, item on the questionnaire were based on the result from the literature review .

Data analysis

The data collected is analyzed statistically through SPSS Version 21.

Graph 1



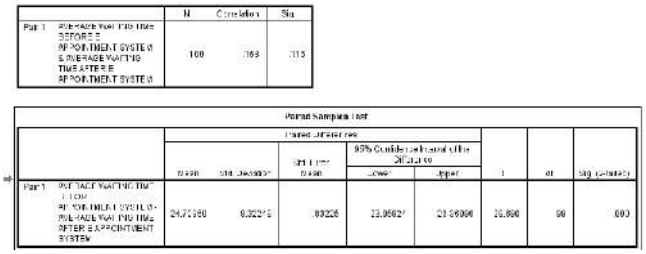
Normal average waiting times is plotted between 05 minutes to 50 minutes. Data is plausible since neither of the variable has any values that are way out of this normal range. It is also observed that there is substantial correlation between the variables. The graph seems to suggest that the mean waiting time before implementation of E appointment system is near 39 minutes (vertical axis) and after Implementation of E appointment system is reduced to 14 minutes (horizontal axis).Some respondent are denoted "outlier",but there score is not extreme enough to justify removing it from the data.

T Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	AVERAGE WAITING TIME BEFORE E APPOINTMENT SYSTEM	38.9389	100	7.67856	.76786
	AVERAGE WAITING TIME AFTER E APPOINTMENT SYSTEM	14.2293	100	4.64917	.46492

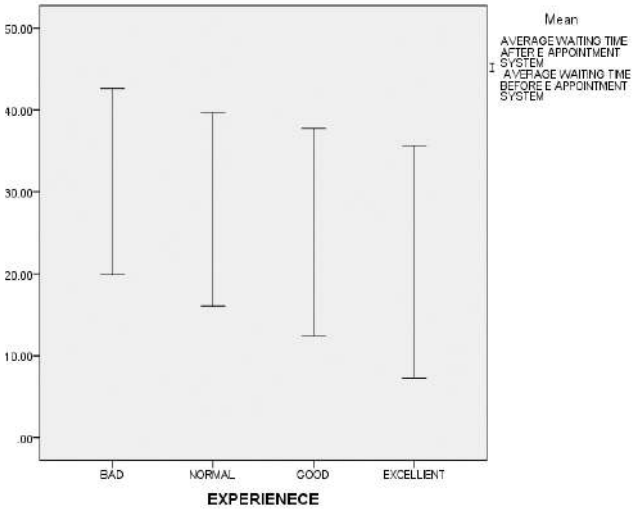
Paired Sample statistics N = 100, there is no missing values on the test variables and the average waiting time after implementation of the E appointment system is 24.7 minutes lower than the average waiting time before E appointment system .



Interpretation and Discussion

- Average Waiting time before and after implementation of E appointment system were weakly and positively correlated ($r = 0.158$, $p < 0.001$).
- p-value denoted by "Sig. (2-tailed)" is 0.
- There was a significant difference between average waiting time before and after implementation of E appointment system ($t_{99} = 29.69, p < 0.001$).
- On average, respondents waiting time is 24.7 minutes higher before implementation of E appointment system . (95% CI [23.05, 26.36]).

Graph 2



Also average waiting time is directly proportional to the patient satisfaction. It is observed that as the average waiting time has reduced after implementation of e-appointment system, the patient satisfaction has increased. Patient experience has changed from bad to excellent.

Conclusion

It is concluded that implementation of E appointment system has reduced the waiting time and has increased the patient satisfaction level.

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Role of E-governance in Inclusive Education

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E-Governance is generally understood as the use of Information and Communication Technology (ICT) at all the level of the Government in order to provide services to the citizens, interaction with business enterprises and communication and exchange of information between different agencies of the Government in a speedy, convenient efficient and transparent manner. (As defined in the National Conference on e-governance by Indian Government)

E-governance can result in improvement of quality of services while providing multi-channel delivery system. The benefit can be seen on both side of series government and citizen. The key is to leverage the improvement in the IT and multimedia field and complete transform the service making it simple, efficient and effective

Areas of Implementation of E- governance in the Educational Sector

Application of E -governance in the educational sector can have substantial impact in running of the system, making it more user friendly with significant time and cost saving. The other major benefit of this system is its flexibility to adopt to the changing educational environment efficiently and effectively. It can facilitate the processing and maintenance of large chunk of data such as registration, admission, student information, classes, time table, transport, attendance, library, salary, expenses, examination, performance, grades, hostels, security, reports, management, transport, staff details and fees among various department in education

E-governance can be implemented in the following areas of the educational sector

1. E- administration: Here the stress is to make the backend option more streamline and faster. With the help of ICT, all documents and process (within & inter-department) are made digital with clearly defined standard operating procedure and responsibilities.
2. E Services Here the focus on providing interactive services to the students by reducing the need of physical interactions. Some of the applications can be request for documents, request for certificate and issue of admit & ID card
3. E-participation Here the key to success is the more and more active student, faculty and administration participation and involvement enabled by ICT in the decision-making process. Application of holistic information technology approach result in faster, easier and much better delivery of services

What is an Inclusive Education

Inclusive education is anew approach towards educating the children with disability and learning difficulties with that of normal ones within the same roof. It aims to meet the needs of all children with a specific focus on those who are vulnerable to marginalization and exclusion. This type of education system is possible only in flexible system that assimilates the needs of diverse range of learners and adapts itself to meet these needs.

Role of the E- Governance in the Inclusive Education

Good governance is generally characterized by participation, transparency and accountability. E-governance can help in faster and effective deployment of the inclusive education. It will help children with special needs to access, participate and learn from the educational services like what children without special need will do.

E governance in education will result in the new ways to communicate with students, new ways to impart education and new ways to organise and deliver information and services. It gives equal right to children with special needs to participate, learn and interact. The implementation of the information technologies and internet series in the education system has the potential to totally transform the between administration and students in a positive way, thus contributing to the achievement of improving the educational standards.

An integrated e - governance system can enable the authorities to benchmark and analyse the performance of different institutes in the related field and come up with the best practices for different processes and functions. The same can be shared in the system enabling school/collages to learn from each other and improving the overall quality of the education system. Moreover, the availability of centralized information system can help decision makers to better analysis and formulate the strategy. It can also result in the customized strategy which takes care of the special local needs of that area. It can also result in better control on both timeline and cost of the different projects going through in the system.

E-governance can help the inclusive education in the following ways -

1. Improve the internal process of government. Faster communication within the system, controlling the administrative delays.
2. Bring in transparency- Provide better information and service delivery to all students under one roof. Any type of child or parent can get information about services, programs and policies
3. Online availability of lesson and teachers/experts With the help of IT, remote classroom and training can be implemented. It can help both teachers (learn and update their skills) and students (wide variety of learning options and that too from the best source)
4. Increase efficiency Can reduce the time devoted for non-value-added work, eliminate the duplication of work and streamline the process
5. Lower costs can significantly reduce the transaction and implementation cost and time, making Inclusive education more affordable
6. Improve the quality of education Easy ability of the educational material and freeing the staff to focus more on the children may result in the improving the quality of education
7. Easy tracking of the programs/polices - Timely information relating to programs can be shared to the school and at the same feedback can be collected on the live basis. So, it becomes easy to modify the policy for higher effectiveness and efficiency if required
8. More easy and effective classroom planning E-governance can help teacher plan class room activities and track students' performance better. It can also help in making customized plan for children with special needs
9. Flexibility to adopt to changing environment and needs E-governance system is easy to modify. It can be continuously learning process, take the input/feedback from the system and modify the process accordingly.

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A Study Habits of Higher Secondary School Students at Belonia

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Abstract

"Plants are developed by cultivation and man by education" says Locke. Pestalozzi regards education as the natural, harmonious and progressive development of man's powers. Rousseau recognizes education as a process of development. Gandhi also regards education as drawing out of the best in child and man-body, mind and spirit. There is a difference between education and literacy, he says literacy is neither the end nor the beginning, but a means where by men and women can be educated. Education is the most effective instrument of social and economic change and it is the education that determines the level of prosperity, welfare and securities of the people. Education has always been concerned with the prediction of scholastic achievement or academic achievement of individuals. Generally academic achievement refers to the extent or degree of mastery in certain areas of studies. Hence it has to be relevant and it would be reflected through the academic achievement of the students. And study habits are very important characteristic for being educated and fruitful academic achievement. As much study habits is important for higher academic achievement of students as much it is important for their fruitful use of leisure time. Considering the role of study habits, present study was taken up to study the "Study Habits of Higher Secondary School Students". For this purpose descriptive survey method of research was used, with the sample of 163 higher secondary school students selected randomly at Belonia. The methodology includes 't' test.

Keywords: Education, Study Habits, Academic Achievement, Learning Environment, Development.

Introduction

Education can be described as the totality of the experiences made available to individuals in formal or informal situations, to make them develop personality and to be useful to themselves and the society at large. The educative process is an interactive process continually going on between the person concerned and his environment, involving modification of behaviour or of natural development. The function of the educator is to provide the individual with a revitalizing atmosphere for gradually unfolding his innate capacities, and provide the child with an environment, which stimulates him to change his behaviour in the most desirable ways. Education may lead to development of interests, self-concept, ideals and values. Education provides the harmonious and integrated development of total personality of the individual. Education has always been concerned with the prediction of scholastic achievement or academic achievement of individuals. Generally academic achievement refers to the extent or degree of mastery in certain areas of studies. Hence it has to be relevant and it would be reflected through the academic achievement of the students. And every educator plays a special stress on the aspect of development of education.

The family plays most important role in the education of the child. The child is born in a family and this is the first agency through which he gets education for sociability. Therefore, the influence of the family upon the child is very great. In this task his parents, his home environment and social standing of the family in the community, his aim and objectives, his interests, his intelligence all play a vital role in the child's achievement at the school (Angelo Patri, 1948). Recent researches have recognized the multi-dimensional character of parental involvement and have tried to capture the multitude of parental activities regarding children's education. The complex interrelationships which define six different types of parental involvement are:

1. Parents' basic obligations for establishing a positive learning environment at home.
2. Parent-School communications about school programs and student progress.
3. Parent participation and volunteering at school.
4. Parent and school communications regarding learning activities at home.
5. Parent involvement in school decision making and governance.
6. Parent collaboration with community organizations that increase students' learning opportunities.

Secondary education is vital tool for intellectual, cultural and aesthetic development for achieving social well-being. It contributes to national development through dissemination of specialized knowledge and skills, the vitality of secondary education and research is crucial not only for the present development but also to tackle the challenge successfully that

confronts it. It provides society with competent and trained girls and boys with different development sectors. The students who have not been motivated enough do not attend classes regularly, do not listen to the lesson carefully, and do not want to do homework (Pint rich and Shuck, 1996). Hence motivating learners is taken as an important aspect of effective learning. The important issue in achievement motive is the progress according to the student's performance targets. The achievements of the students about the course are usually determined by the scores in examinations and the passing notes in class. Success of the student is measured by his ability to study, ability to manage time and other resources to complete an academic task successfully. The efficient and effective way of learning depends upon the study habits of the students. As much study habits is important for higher academic achievement of students as much it is important for their fruitful use of leisure time. Observing all these it was decided to undertake a study to find out study habits of secondary school students.

Objectives:

1. To compare the study habits of secondary school boys and girls.
2. To compare the study habits of government and private students of higher secondary schools.
3. To compare the study habits of rural and urban students of higher secondary schools.
4. To compare the study habits of students of working and non working mother.

Research Studies

Aravind N. Chaudhari (2013) study revealed significant difference and positive relationship between study habits and academic achievement of higher secondary school students. It is suggested that parents should get appropriate guidance and counseling about dealing with higher secondary school students to develop good study habits for the educational development of their kids. DR. Suresh Chand (2013) found higher secondary school students studying in Govt. schools are significantly better on home environment and planning of work and planning of subjects than their counterparts studying in private school, but private higher secondary school students are significantly better than Govt. secondary school students on preparation for exam component of study habit. Dr. Chamundeswa, S., Sridevi, V., and Archana Kumari (2014) found one of the factors contributing to achievement among pupils of comparable endowments is the variation of the pupil's ability to organize their work and to study efficiently. Amandeep Kaur and Raj Pathania (2015) concluded that there exists a significant relationship among various dimensions of study habits and academic performance which goes in accordance on study habits of higher secondary school students in relation to their scholastic achievement, in which they found significant positive correlation between study habits and scholastic achievement of higher secondary school students as a whole and dimension wise. Dr. Santhini Devi, S. (2016) found that in case of study habits, Gender has an influence on the higher secondary school, and in case of Academic Achievement, Gender has not an influence on the high school students. Maxwell D. Eremie, ED. D. (2017) found significant difference between male and female students' time management in their study habits. Kabiru Mohammed Badau. (2018) study concluded that bad study habits negatively affect academic performance of higher secondary school students, while good study habits improve learning outcomes. Dr. Rajinder Singh (2018) concluded significant difference in mean scores of comprehension area of study habits of male and female senior secondary school students. Female senior secondary school students have significantly better study habits in comprehension area than male senior secondary school students.

Hypothesis:

1. There is no significant difference between boys and girls of higher secondary schools with respect to their study habits.
2. There is no significant difference between government and private students of higher secondary schools with respect to their study habits.
3. There is no significant difference between rural and urban students of higher secondary school students with respect to their study habits.
4. There is no significant between students of working and non working mother with respect to their study habits.

Design and Methodology:

Descriptive survey method of research is been employed for the present study. A sample of 123 higher secondary school students was selected through stratified random sampling method from private and government schools of Belonia`. Sample consists of boys and girls of urban and rural areas.

Tool

A Standard Study Habit Inventory (1985) by Prof M. Mukhopadhyaya & D.N. Sansanwal was used for the study.

Statistical Analysis

The data was analyzed using Mean, SD, and 't' test.

Analysis and Interpretation

Hyphothesis-1

There is no significant difference between boys and girls of higher secondary schools with respect to their study habits.

Table -1: Comparison of boys and girls with respect to their study habits

Variable	N	Mean	SD	't' value
Boys	62	81.26	11.67	0.24^{NS}
Girls	61	81.75	11.33	

d_f= 121 P at 0.05 Level is 1.97 Not significant at 0.05

From the above table it can be seen that, there is a no significant difference in the study habits of boys and girls. The difference is a not significant as the 't' Value (0.24) is less than 't' table value (1.97) at 0.05 level of significance. As seen from the mean scores in the above table, study habits of boys and girls seem to be followed in the same manner. And no significant difference was found between boys and girls of higher secondary schools in their study habits.

Hyphothesis-2

There is no significant difference between government and private students of higher secondary schools with respect to their study habits

Table-2: Comparison of govt. and private School students with respect to their study habits

Variable	N	Mean	SD	't' value
Pvt.	62	72.85	7.05	$13.01^{\$}$
Govt	61	90.29	7.79	

d_f=121 Significant at 0.05

From the above table it can be seen that there is a significant difference in the difference in the study habits of government and private school students. It is also seen from the mean scores that government students have structured study habits when compared to that of private school students. There is significant difference between government and private students of higher secondary schools with respect to their study habits.

Hypothesis-3

There is no significant difference between rural and urban students of higher secondary schools with respect to their study habits

Table-3: Comparison of rural and urban students with respect to their study habits

Variable	N	Mean	SD	't' value
Rural	63	81.38	12.10	0.12^{NS}
Urban	60	81.63	10.85	

d_f= 121 Not significant at 0.05

No significant difference is found from the above table in the level of achievement in higher secondary school students of rural and urban school students. The difference is not significant as the 't' value (0.12) is greater than 't' value (1.97) at 0.05 level of significant. And the hypothesis is accepted.

Hypothesis-4

There is no significant between students of working and non working mother with respect to their study habits

Table–4: Comparison of students of working and non working mother with respect to their study habits

Variable	N	Mean	SD	't' value
Working mother	27	80.43	11.16	0.57^{NS}
Non working mother	96	81.82	11.59	

d_f= 121 Not significant at 0.05

From the above table it can be seen that there is no significant difference in the study habits of students of working and non working mothers. The difference is not significant as the 't' value (0.57) is less than 't' value (1.97) at 0.05 level of significance. There is no significant between students of working and non working mother with respect to their study habits. Thus, the hypothesis is accepted.

Findings

- No significant difference was found in the study habits of boys and girls.
- Significant difference was found between government and private students of higher secondary schools with respect to their study habits. It was also observed that government students have structured study habits when compared to that of private school students.
- There is no significant difference between rural and urban students of higher secondary school students with respect to their study habits.
- No significant difference was found between students of working and non working mother with respect to their study habits.

Suggestions

To develop good study habits various programmes can be arranged in the school. Head masters can motivate different subject teachers to practice novel ideas related to study habits in the classroom situation. Parents can guide and motivate the students to follow study habit techniques in their study.

Suggestions for further Research

Based on the present study, a good number of new areas can be considered for critical observations.

- Survey of difficulties faced by students in learning concepts, terms, laws from different subjects and to suggest the remedies through the application of different study habits technique.

- Survey of study habits of night school / college students.
- Effectiveness of study habits programme on the academic achievement of the night school / college students.
- Effectiveness of study habits programme on the academic achievement of gifted students.

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Educational Technology and challenges in Indian Education

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Abstract

Educational Technology involves processes, methods and techniques, products, Resources and technologies organized into workable systems. The emerging trend in education it the educational technology which influence the whole education system and boosts the education flow. The education technology involved a large number of experiments aimed at the qualitative improvement of schools, adopted the systems approach to analyze the problems plaguing the particular situation, and have evolved a range of solutions. The key phrases in Educational Technology are appropriate technology, that is, appropriate to the task in hand for meeting specific educational objectives, and the organization of all available resources into a workable system, which is checked again and again to ensure that it is appropriate and changing it where it is not working. This article is written to spread knowledge about the educational technology and new learning environments and also help to guide researchers and leaders in the field.

Key Words: Educational Technology, Appropriate Technology, Appropriate Teaching Learning System, Government Sector, Voluntary Sector, Challenges

Introduction

The term Educational Technology is word which highlights the changing trends in educational delivery system which involves appropriate, adapted and adopted methods, processes of teaching learning system to satisfy diverse need of the learner. The challenge is to design appropriate systems that will provide for and enable appropriate teaching-learning systems that could realize the identified goals.

Conceptions of educational technology have been evolving as long as the field has, and they continue to evolve. Therefore today's conception is a temporary one, a snapshot in time. In today's conception, Educational Technology can be defined as an abstract concept or as a field of practice. First, the definition of the concept:

"Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources."

The key to meeting this challenge is an appreciation of the role of Educational Technology as an agent of change in the classroom, which includes not only the teacher and the teaching-learning process but also systemic issues like reach, equity, and quality. Over the past decades, educational technology in India has taken two routes: The first route involved a large number of experiments aimed at the qualitative improvement of schools, adopted the systems approach to analyze the problems plaguing the particular situation, and have evolved a range of solutions. These have included the development of flexible systems, alternative curricula, multilevel organization of classes; low-cost teaching-learning materials, innovative activities, continuous support systems for teacher training, etc. While many of these experiments have demonstrated intrinsic merit, they have been restricted to pockets of intense practice and have failed to influence the larger school system. Information and Communication Technologies (ICTs) have brought in a convergence of the media along with the possibility of multi-centric participation in the content- generation and disseminative process. This has implications not only for the quality of the interchange but also for drastic upheavals of centre-dominated mindsets that have inhibited qualitative improvement.

The reason why the term Educational Technology is misconstrued is on account of the changing nature of ET's second component, viz. technology. The basic tenet of Educational Technology, viz., using all available resources (human and non-human) in a systematic manner to find viable solutions to educational problems, does not change. However, as technologies change and newer ones are brought into service in education (or, for that matter, into other spheres of development), the configurations, structures, and applications of Educational Technology will also change

The universally accepted definition of Educational Technology involves processes, methods and techniques, products, resources and technologies organized into workable systems. The recognition of the need for a multilevel organization of a classroom, for instance, along with the designing of an appropriate programme and its implementation, becomes as much an exercise in Educational Technology as the use of audio-visual aids or the information superhighway.

Educational Technology could be defined in simple terms as the efficient organization of any learning system, adapting or adopting methods, processes, and products to serve identified educational goals. This would involve:

- Systematic identification of the goals of education, taking into account nationwide needs (higher scalability, for instance), the system capabilities, and the learners' needs and potential.
- Recognition of the diversity of learners' needs, the contexts in which learning will take place, and the range of provisions needed for them.
- Recognition of not only the immediate needs of children but also their future needs in relation to the society for which we are preparing them.
- Designing, providing for, and enabling appropriate teaching-learning systems that could realize the identified goals.
- Developing a range of support systems and training, creating the enabling systemic conditions/materials, reaching these to the school system, and training teachers and students to use them.
- Research into existing and new techniques, strategies and technologies for solving problems of education, enabling judicious and appropriate application of technology.
- Appreciation of the role of Educational Technology as an agent of change in the classroom, influencing the teacher and the teaching-learning process, and its role in systemic issues like reach, equity, and quality. (This appreciation should not be limited to educators alone, but should extend to planners and administrators as well, since systems both at micro and macro levels will be necessary to meet the current challenges of education.)

Historical Perspective

The basic elements of Educational Technology have always been present in any effective teaching-learning system, though it was not called Educational Technology. For example, the old Gurukul system in India stressed individualized instruction and emphasized learning, which are also features of ET. The training programme in the Gurukul was devised to suit the needs and abilities of the pupil. It was a one-to-one (Guru-Shishya) system, but it did not mean rote learning or following the guru blindly. A Sanskrit maxim (Shishyat icchet Parajayam) states that the fervent wish of a guru should be that his disciple would better him. Moreover, the teaching programme was devised not only to suit the needs and potential of the pupil but also to suit the societal needs as expressed in identified learning goals

Efforts to Mobilize Educational Technology, Large and Small

A number of groups doing innovative work in the field of Educational Technology in India and abroad made presentations of their work and experiences before the Focus Group. The list of presenters along with their topics of presentation is given in the Appendix. In addition, teams of Focus Group members visited several innovative programmes and made presentations to the group. The boxes in this paper give information about some of these programmes. Readers may visit their respective websites for additional information.

Initiatives in the Voluntary Sector

Several educators from Gandhiji onwards have sought to make education relevant and liberating by introducing alternative and experimental systems of learning. They have also tried to provide equity and quality in education by directing their efforts towards educating the marginalized child and providing the needed skills and knowledge in stimulating ways. Gijubhai Badheka and Tarabai Modak worked in the sphere of early childhood education. The Tilonia programme in Rajasthan; the Hoshangabad project of Kishore Bharati / Eklavya in Madhya Pradesh; Gram

Mangal (an extension of the work done by Tarabai Modak and Anutai Wagh with tribal children) in western Maharashtra; the Bhandup project and the Avehi-Abacus project in Mumbai's municipal school systemthese are a few examples of such efforts undertaken and sustained

at various times in different parts of the country. Information on the Bhandup project, the Gram Mangal project, and the Avehi-Abacus project is given in Appendix Nos. 1, 2, and 3 respectively. Some of these projects like Tilonia, Hoshangabad, and Bhandup were replicated in a large number of schools after their efficacy had been proved in the project mode. However, even though the Tilonia and Hoshangabad models showed good results in the wider mode too,

they were stopped because there was no political will to sustain them. The Bhandup project suffered neglect because the new municipal bureaucratic regime could not be bothered to continue it. The Bhandup programme continues to work well in those districts where the district education officers are supportive. It is sustained by teachers who have seen how childrencome alive and learn enthusiastically with multilevel teaching. This programme lets children move at their own pace, provides learning materials made at low or no cost, and encourages peer learning.

Efforts Initiated by the Government

Mass media like radio and television have been used in a sporadic fashion for education for a long time. One of the earliest systematic and large-scale efforts in India to run an educational television channel was SITE (Satellite Instructional Television Experiment) in 197576, which was beamed to six states, and is well documented. Many innovations were undertaken in

SITE in both devising and deploying suitable hardware (for example, battery-operated television sets in Orissa, ½" video technology) and making original software. This software was made by many agencies other than Doordarshan, which until then had a monopoly on video production and broadcasting in the country.

Some common Questions and Challenges

1. How can schools afford to purchase enough multimedia-capable, Internet connected computers so that a classroom machine is always available for every two to three students?
2. How can schools afford enough computers and telecommunications to sustain new models of teaching and learning?
3. How can many educators disinterested or phobic about computers and communications be induced to adopt new technology-based models of teaching and learning?
4. How do we prove to communities that new, technology-based models of teaching and learning are better than current instructional approaches?
5. How can educational technology increase equity rather than widen current gaps between "haves" and "have-nots?"
6. If we use technology well, what should we expect as "typical" student performance?
7. If we use current technology then how much it will be use full for disadvantaged and underprivileged children?
8. How technology can help to enhance classroom environment for group learning and cooperative learning.
9. How technology can help in day to day classroom learning and sports.
10. If a school arranges finance to purchase new educational technological equipment and installs in the school than what will be the finance return options and difficulties.

The use of technology in the classroom has had a profound effect on the way that teachers teach and students learn, and Harvard Medical School is at the forefront of this sea change in teaching techniques. Leading the charge is the school's Center for Educational Technology, created in 2001 to help students, faculty, and IT experts collaborate to create new forms of digital content.

Now-a-days, many educational institutes/Universities have come up with online learning and examinations with the help of Information and communication Technology. In the field of rehabilitation the many educational technological changes have come up. The Rehabilitation Council of India (RCI), Indira Gandhi National Open University (IGNOU), and National Institute of Open Schooling (NIOS), and many other universities working for the educational advancement in education in the field of rehabilitation education. The use of Tablet (A Small Computer) is the most recent development in school education in India.

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Assistive Devices and Technologies

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Assistive devices and technologies are those whose primary purpose is to maintain or improve an individual's functioning and independence to facilitate participation and to enhance overall well-being. They can also help prevent impairments and secondary health conditions. Examples of assistive devices and technologies include wheelchairs, prostheses, hearings aids, visual aids, and specialized computer software and hardware that increase mobility, hearing, vision, or communication capacities. In many low-income and middle-income countries, only 5-15% of people who require assistive devices and technologies have access to them.

Assistive Technology for Learning: What You Need to Know

At a Glance

- Assistive technology is any device, software, or equipment that helps people work around their challenges.
- Some examples of assistive technology are text-to-speech and word prediction.

Assistive technology includes low-tech tools, too, like pencil grips. Technology is everywhere these days. But did you know that there are specific tech tools that can help people who learn and think differently? These tools called assistive technology, or ATare often inexpensive and easy to use.

What is assistive technology? How can kids and adults benefit from these tools, and where do you start?

Assistive Technology Basics

AT is any device, software, or equipment that helps people work around challenges so they can learn, communicate, and function better. A wheelchair is an example of AT. So is software that reads aloud text from a computer. Or a keyboard for someone struggling with handwriting.

These tools can help people work around their challenges, while also playing to their strengths. This is especially important for kids who struggle with learning whether in reading, writing, math, or another subject. AT can help these kids thrive in school and in life. And that can help grow their confidence and independence.

There lots of myths about AT. Some wrongly believe that using AT is "cheating." Others worry that kids who use AT may become too reliant on it.

Examples of Assistive Technology Tools

Despite the word "technology," not all AT tools are high-tech. AT includes many simple adaptive tools, like highlighters and organizers. A great example of low-tech AT is a pencil grip.

Many AT tools are high-tech, though. And because of advances in technology, tools are now available on a variety of platforms:

- Desktop and laptop computers
- Mobile devices (includes smart phones and tablets)
- Chrome books (and the Chrome browser used on any device)

Examples of high-tech AT tools include text-to-speech (TTS), dictation (speech-to-text), and word prediction. But there are hundreds of AT tools that can help with learning challenges. For more examples, explore:

- Assistive technology for reading
- Assistive technology for writing
- Assistive technology for math
- Assistive technology for listening comprehension

Some of these AT tools are free. Some tools are even built into mobile devices. (Watch as an expert explains how to turn on TTS on a smart phone or digital tablet.)

How to Find the Right Assistive Technology Tool

With so many AT tools available, finding the right one can be overwhelming. One good approach is to choose AT that targets a specific struggle. For example, if a child struggles with writing, try dictation technology. As the child speaks, words appear on the screen.

People with access to a mobile device, like a smart phone or a digital tablet, can add AT tools to it with apps. Explore these ideas:

- Apps to help young kids with reading
- Apps to help teens with organization
- Apps to help with note-taking
- Apps to help younger kids build self-control
- Apps to help teens and tweens build self-control
- Meditation apps for kids
- Apps for back-to-school challenges
- Websites, apps, and games to help with learning to type

People with access to a desktop or laptop computer can use AT software for reading, writing, and math. And those with access to a Chrome book or the Chrome internet browser can look at Chrome tools to help with various challenges.

Assistive Technology for Young Children in Special Education: It Makes a Difference

Technology can level the playing field for students with mobility, hearing, or vision impairments. Technology has opened many educational doors to children, particularly to children with disabilities. Alternative solutions from the world of technology are accommodating physical, sensory, or cognitive impairments in many ways.

Much of the technology we see daily was developed initially to assist persons with disabilities. Curb cuts at street corners and curb slopes, originally designed to accommodate people with orthopedic disabilities, are used more frequently by families with strollers or individuals with grocery carts than by persons with wheelchairs or walkers. The optical character reader, developed to assist individuals unable to read written text, has been adapted in the workplace to scan printed documents into computer-based editable material, saving enormous amounts of data entry labor.

Children with disabilities often feel better about themselves as a result of using technology. Technology can be a great equalizer for individuals with disabilities that might prevent full participation in school, work, and the community. This is most evident in the case of individuals with mobility, hearing, or vision impairments, but is also true for individuals with limitations in cognition and perception. With technology, an individual physically unable to speak can communicate with spoken language. Using a portable voice synthesizer, a student can ask and respond to questions in the "regular" classroom, overcoming a physical obstacle that may have forced placement in a special segregated classroom or required a full-time instructional aide or interpreter to provide "a voice."Improvements in sensor controls enable subtle motor movements to control mobility devices, such as electric wheelchairs, providing independent movement through the school and community. Text and graphics enhancement software can enlarge sections of a monitor enough to be seen by persons with vision impairments. Text can be read electronically by a digitized voice synthesizer for a person who is blind. For persons with hearing impairments, amplification devices can filter extraneous noise from the background or pick up an FM signal from a microphone on a teacher's lapel. Word processing, editing, spell checking, and grammatical tools commonly found in high-end software facilitate the inclusion of students with learning disabilities in regular classrooms by allowing them to keep up with much of the work. Not inconsequentially, the children often feel better about themselves as active learners.

Technology is providing more powerful and efficient tools to teachers who work with children with disabilities. These tools enable teachers to offer new and more effective means of learning while individualizing instruction to the broad range of student learning needs. Educators are using computers as tools to deliver and facilitate learning beyond drill and practice, to provide environments that accommodate learning, and to ensure enhanced and equitable learning environments to all students.

Access to the World Wide Web, email and other electronic learning environments is common in many classrooms. In these environments, students around the world can interact in real time via onscreen messaging or video and audio transmissions. In most of these learning situations, a disability makes no difference at all. The range of potential assistive technology devices is large and includes both high-tech devices like computers and low-tech, manually operated devices.

Assistive Technology Defined

The definition of assistive technology applied to education is extremely broad, encompassing "any item, piece of equipment, or product system whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities."

As a result, the potential range of AT devices is incredibly large, and both "high-tech" and "low-tech" devices are included. High-tech devices may be computers, electronic equipment, or software. Although electronically operated, high-tech devices need not be expensive, a simple low-cost switch that controls a battery-operated toy can be considered a high-tech device, as can a tape recorder. Low-tech devices are manually, not electronically, operated. This group includes devices such as pencil grips, mouth sticks, and mechanical hoists.

This definition also expands the consideration of potential educational applications with its focus on devices "used to increase, maintain, or improve the functional capabilities of persons with disabilities." As educators, we try to increase or add new academic, social, and daily living skills and knowledge to the functional capability of all children. This is a basic goal as we prepare children to take their place in society.

In the case of children with degenerative impairments, such as muscular dystrophy, educators may be working to keep children functioning at their current level. They may be striving to help students maintain their capability to function in the world. Teachers work with students to improve skills and knowledge, making existing skills and knowledge even more functional and improving fluency so that functional capabilities may be generalized into different settings.

It is critical to understand the implications of this definition to comprehend its effect on children with disabilities in our schools. It is fairly easy to understand how the definition is applied with regard to children with physical or sensory disabilities. To see a young child who had been unable to speak for her first five years say her first sentence with a speaking computer device presents an exciting and clear picture of assistive technology. The benefit of AT is also easy to comprehend when a child who cannot hear can understand his teacher's directions because real-time captioning converts the teacher's speech to text projected onto his laptop computer.

The definition of assistive technology also applies to the more difficult-to-gauge tools that teachers use to deliver and facilitate learning, including instructional applications of

technology. These applications range from drill and practice tutorials to facilitated learner-based environments provided through the Internet or interactive hypermedia and multimedia-based instruction.

It is important to understand that virtually all applications of technology -- tools for children to learn, as well as tools for teachers to provide learning opportunities -- can be defined as assistive technology. This is true for individual children with disabilities whose disability has a primary impact on academic performance (e.g., learning disabilities) or functional performance (e.g., multiple physical and visual disabilities).

Legal and Moral Requirements

The mandate to provide assistive technology to children with special needs is grounded in the moral concerns protected by the U.S. Constitution and its amendments. The Education for All Handicapped Children Act (P.L. 94-142) was based on the Supreme Court's 1954 Brown vs. Board of Education decision that separate education was not equal education under the 14th Amendment to the Constitution. At the time the law was passed by Congress in 1975, nearly 2 million children were excluded from schools in the United States. With the legislation, the president and the Congress established a legal requirement for a "free appropriate public education in the least restrictive environment" for children with disabilities and, as a result, the field of special education began to flourish for the first time in nearly seventy-five years.

Many controversies surfaced, however, about the extent of the required educational services and the cost to society for those services. The major debates have focused on the need for a clear definition of an "appropriate" education in the least restrictive environment and the requirement to provide assistive technology devices and services to all individuals with disabilities.

'Appropriate' Education

The requirement for an "appropriate" education in the least restrictive environment has led to the development of a separate educational system designed to meet the needs of children with disabilities. Some educators contend that this is the same type of separate system that the Supreme Court found unconstitutional in 1954. These individuals suggest that all children, regardless of ability, should be educated with their neighborhood peers in their local school.

Others in favor of the special education system argue that it is necessary to meet the educational needs of all children with disabilities, particularly in the "continuum of services" mandated by the Individuals with Disabilities Act (IDEA). In their view, children must have specific intervention designed to "mainstream" them back into regular education. Without the intervention, these individuals believe that students will be doomed to continued and more significant failure. They also note that, while the goal of mainstreaming is reasonable, some children may not benefit appropriately from a full inclusion program.

Although there are many arguments on both sides of the issue, it is apparent that new technologies can provide the tools to bring more children with disabilities into "regular" educational settings. In my opinion, assistive technology will certainly mainstream more and more children in wheelchairs, children who cannot physically speak, see, or hear, and children who need computers to write, organize, think, and function educationally.

The AT Requirement

The second debate centers on the requirement to provide assistive technology to all students. The initial legislation, the Education for All Handicapped Children Act, did not require schools to provide assistive technology devices and services to individuals with disabilities. The current assistive technology mandate was created by later legislation and prompted by the technological revolution resulting from the development of the microcomputer.

Subsequent legislation passed by Congress encouraged states to develop services designed to provide assistive technology to all persons with disabilities and required provision of AT as a special education service (trained special education teachers in special classes), related service (occupational, physical, speech therapies, and other services needed to access education) or supplemental service (services necessary to maintain a child in regular education classes).

Many states have not addressed the AT issue, since assistive technology devices and services were identified as requirements only recently. This may be due to a fear of "breaking" instructional budgets by purchasing high-cost equipment in already cash-short school systems. Concern also exists that the rapid evolution of technology creates the potential of costly investment in devices that may have a relatively short life span.

A close look at the situation will show that these concerns are not well grounded, however. Schools already use extensive amounts of AT, and need only to identify it as such. Nearly any use of computers falls into this category, as do tape recorded instructions or homework, copies of notes from a classmate or teacher, switch-operated toys, drawing paper taped to table tops, as well as large pencils and crayons. All of these could be noted, as required, in Individual Education Plans (IEPs) and Individual Family Service Plans (IFSPs).

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The Role of Assistive Technology in Special Education

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The Individuals with Disabilities Education Act (IDEA) stipulates that schools must provide children with disabilities the appropriate services and accommodations. After evaluations by health professionals and educators, an Individualized Education Plan (IEP) will be drawn up where educators, parents, and health professionals will outline the child's unique needs and the appropriate response. Assistive technology often falls into this category of services accommodations.

What is Assistive Technology?

Simply put, assistive technology is a device or tool that helps someone with a disability function better. Assistive technology improves function in children with both learning and physical disabilities. And, despite the name, these devices are not always hi-tech. Assistive technology has been in the classroom for decades, and sometimes even the simplest things can make a huge difference.

What are the Different Types of Assistive Technology?

Tablets, Computers, and Software

When we think of the word "technology," these devices are likely the first thing to come to mind. The benefits of computers and tablets are extensive. They are customizable to accommodate the unique needs of each special education student. Adjustable settings help with reading (for example, enlarging text size), play audio and video, record sound and video, have text-to-speech software, can come with touch-screen options, and even have gesture recognition technology for hands-free commands and typing make tablets and computers as strong assistive technology devices.

Assistive Technology: Facilitators of Special Education

Students suffering from disability of any kind find it hard to manage everything in class and attend lectures on a daily basis. These students have trouble keeping up with everything that is taught in school. They are also unable to work at the same level as their classmates who do not have any developmental or physical impairments. They need extra assistance to perform well academically. In today's digital age, assistive technology has become one of the best forms of assistance for people with disabilities.

Assistive Technology Act:

Assistive technology or what we commonly know as AT, was not only recognized as a necessity across the United States, but it was also written into the law when Assistive Technology Act was passed in 1998. Former President Bill Clinton was behind the revision of the Rehabilitation Act of 1973 which required the Federal agencies to make their electronic and information technology easily accessible to individuals with disabilities.

According to law, Assistive Technology is "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities."

Under Section 508 of the law, agencies should provide employees with disabilities and public citizens with access to information similar to that which is available to others.

Assistive technology has broken down the various barriers that hindered and created difficulties for disabled students to perform to their full academic potential. The AT has significantly contributed to the cause of studying in an inclusive classroom instead of a segregated one.

How assistive technology has helped students with special needs

The main challenge students with disabilities have to deal with accurate identification of the disabilities before moving towards conventional teaching settings.

AT addresses a variety of learning complications. Students suffering from cognitive, physical, psychological, and learning deficiencies on various levels can benefit from assistive technology. For example, a student who has trouble writing could use special software and compose a school report by dictating it and getting it converted to text. A teen with dyslexia could use AT which would read aloud text for him. Or a child who has difficulty with math could take help from a hand-held calculator to keep score while playing games.

There are special AT tools and gadgets that assist disabled people with:

Reading: There are numerous tools that help people who struggle with reading. All of these tools might vary from each other a little bit but, all of them help the reader by converting the text as speech. Few types of AT reading tools are text-to-speech (TTS), audio books, digital TTS books, and graphic organizers. These tools help the reader with decoding, reading, comprehension, and fluency. Nowadays, mobile devices and tablets come with in-built AT.

Writing: Like reading, there is quite a range of assistive technology available for those who struggle with the task of writing. For those who have issues with holding a pencil/pen,

can benefit from handwriting tools that help with the task of writing. Some other forms of writing AT tools are touch screens and keyboards, word prediction, dictation (speech-to-text), grammar check, and spell check.

Like reading, there is a built-in AT for writing on mobile devices. Also, you can add chrome apps and extensions in Chrome browsers or use Chrome books.

Listening: Those people who have issues in processing and remembering the spoken word suffer from auditory processing disorder. Listening devices can be integrated into a class or a meeting having multiple speakers. Some examples of listening to tools are noise-canceling headphones, audio recorders, and personal listening devices (PLD) sound field systems.

Math: There are special tools for those which help people who struggle with calculating, computing, aligning and copying down math problems on paper. With the help of AT tools such as visual and audio support, users can solve basic math problems more easily and efficiently.

Memory & Organization: Using AT tools allows a person with disabilities plan, organize and keep a track of things such as task list, contacts, and other notes. These tools help them in managing, storing, and recovering that information while using specific hand-held devices and software.

Tracking and Monitoring: Technology has not only helped students but parents as well. Parents or guardians with speaking difficulties or those who have trouble in mobility can make use of monitoring apps and software which they can install on their children's phones. For example, a child monitoring app can help parents with disabilities keep an eye on their children remotely. The app lets them monitor their real-life and digital activities along with their web browsing history, locations, text messages, call logs and a lot more while sitting in the comfort of their home.

The Impact of Assistive Technology:

Dr. Richard Nyankori, who works as a deputy chancellor for special education at District of Columbia Public schools says that with the help of assistive technology, students now have access to educational opportunities across America. AT shatters the barriers in the way of academic success and opportunities in the future. According to an article on the DCPS website in 2011, students reported that AT tools and devices made a huge difference in their academic performance.

Apart from education, AT also helps students in developing their social skills as well which tends to get negatively impacted due to their impairments. Usually, students find it difficult to connect with their classmates that makes it difficult to make friends. AT devices helps them in engaging with others so that they do not feel isolated.

Empowering students with AT tools that assist them with speech, mobility, calculation, and understanding prepares a path of a brighter future for them. AT has the power to change the lives of people with special needs if integrated into classrooms and routine life from an early age.

A few types of assistive technology software include:

Games: Educational games of all types are an excellent tool for learning. Aside from breaking up the monotony of the traditional lecture-based classroom, games have the added benefit of catering to different learning styles. They also create an interactive world, allowing tactile learners to navigate lessons using touch, sound and sight.

Word processing software: Writing software has come a long way. The inclusions of word-prediction and grammar-checks are particularly helpful for those students with speech or language disorders.

Text-to-speech (TTS): TTS is a technology that reads digital text out loud. TTS is helpful for students who struggle with reading and those with learning disabilities or speech-language disorders.

Importantly, digital devices and software accommodate collaborative learning and instantaneous communication. Files can easily be shared between students during group projects, or students can navigate a virtual lesson alongside their peers. Students can turn in their assignments “online” or work through educational software at home. For special education students, these devices are of particular importance because they are customizable to accommodate the unique needs of each student.

Devices for Physical Disabilities and Impairments

While this category may seem less sophisticated, it is sometimes the simplest accommodations that provide the greatest assistance. Children with visual impairments benefit from braille materials, notebooks with raised margins and lines, large-text books, and audio options for books and instructions. Hearing aids and closed captioning help those who are deaf or hard of hearing. For students with motor coordination difficulties, pencil grips and book holders improve writing and reading abilities.

5 Examples of Assistive Technology in the Classroom

Assistive technology is designed to help students who have learning disabilities. Whether students have physical impairments, dyslexia or cognitive problems, assistive technology can help them to function within the classroom. These tools include any type of equipment or device that helps students to compensate for their learning disabilities. While they are unable to eliminate learning problems entirely, they can help students to capitalize on their strengths and minimize their weaknesses. Among the most innovative technologies available today, the following five are the most popular.

1. Electronic Worksheets

Students with learning disabilities like dyslexia can use electronic worksheets to complete their assignments. These worksheets help students to line up words, equations and numbers on their assignments. On some of the worksheets, text-to-speech or speech synthesizing technology is even available.

2. Phonetic Spelling Software

For many children with learning disabilities, reading and writing can be a challenge. Phonetic spelling software is designed to automatically convert the student's typing into the word that they intended to write. For alternative reading options, students can always check out audio books. With the audio book, students can follow along in their text and overcome reading difficulties.

3. Talking Calculators

Students who have dyscalculia can benefit greatly from a talking calculator. The gadget makes it easier to check assignments, read numbers and perform calculations. While the talking calculator is a fairly simple tool, it offers an exceptional benefit for students who would otherwise struggle in math classes. Other than talking calculators, students can also check out text-to-voice devices. They function on the same concept of converting written words into an audible track. Students can use these devices to check their spelling or to improve their reading comprehension skills.

4. Variable Speed Recorders

Everyone has a different learning style, and many students struggle with understanding auditory lectures. For these students, a variable speed recorder is an ideal solution. In essence, the student just has to hit record while they are in class. Afterward, the recording can be slowed down or sped up for the student to listen to it again and again. If the pitch of the recording is hard to understand, students can modify the pitch up or down to make their lectures more accessible.

5. Videotaped Social Skills

Autistic children and other children with learning disabilities may struggle to figure out normal social interactions. In the past, the most common way to learn social interactions was to practice them. Unfortunately, many children inadvertently behaved inappropriately as they tried to learn what defined "normal" social interactions. With videotaped social interactions, students can learn important life skills and social behavior without accidentally offending someone. In addition to interpersonal skills, these videos can work for self-help, linguistic, academic and emotional problems as well.

Learning disabilities can manifest in a variety of different ways. From mild disabilities to debilitating problems, these disabilities affect the student's ability to learn and take part in a classroom. Unfairly stigmatized in popular culture, it is now possible to use technology to overcome many learning disabilities. From offering students ways to slow down the lecture to providing talking calculators, these technological devices are able to meet the student's unique needs. With help, students can become the competent, exceptional individuals that they already have the potential to be.

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Does Concept Mapping Enhance the Learning? - An Experiment with Special Needs Children

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Abstract

The present research paper aims at exploring the impact of concept mapping on students with special care. There are several students who find it difficult to read long texts. There are various diseases and problems which are related to eyes. In this paper the researcher has discussed the benefits of concept maps for such students who need special care for having eye related problem where long texts are concerned. In this study the students of IX class were consulted to know the impact of concept maps on their time, energy, interest and scores. They were given contents in text forms and in concept map forms. Their times and understanding were compared. The study indicated that concept maps save time and energy. Furthermore, these are very useful for those who have problems with long reading which causes eye related problems. Findings of the study suggests that concept mapping enhances the learning capacity of the students.

Key words

Concept maps, time and energy, Conceptual understanding, students with special need.

CHILDREN WITH SPECIAL NEEDS- A PROLOGUE

They are children who have a disability or a combination of disabilities that makes learning or other activities difficult. Special-needs children include those who have: Mental Retardation, which causes them to develop more slowly than other children. Speech and Language Impairment, such as a problem expressing themselves or understanding others. Physical Disability, such as vision problem, cerebral palsy, or other conditions. Learning Disabilities, which distort messages from their senses. Emotional Disabilities, such as antisocial or other behavioral problems.

Situation for vision and interest related special care

Asthenopia (eye strain) is a feeling that your eyes are tired, sore, or achy. You can feel this way after reading or looking at a computer or phone screen for a long time. This sensation develops due to prolonged use of the muscles that control your eye movements and your pupils

Photophobia is increased sensitivity and aversion to light. You might squint or even experience eye pain and discomfort due to photophobia.

Anything that requires intense eye use can cause fatigue. Some of the most common are:

- Reading
- Writing
- Driving

If you look at bright light or spend time in a place that's too dim, it can also tire your peepers.

Apart from the above mentioned situations, lack of interest is also one of the situations when we feel their special need of tools and technique which may motivate the students for learning the things desired. We can say that there are several situations related with physical and mental aspects in which we feel there need of special care. Concept maps in such situations are very useful for saving their eyes from getting tired and moreover such maps motivate learners from getting bore and being mentally tired. Such maps also save time.

CONCEPT MAPS

A concept map is simply a kind of diagram that displays the relationships between concepts. The idea was originally developed by Joseph Novak in the 1970s. It is a schematic device for representing a set of concept meaning embedded in a framework of propositions (Novak and Gowin, 1984). These are graphical tools for organizing and representing knowledge. A Concept Map's structure seems to be a mental presentation of knowledge, that Collins and Quillian (1972) labelled "Semantic Memory". CM may help a learner to memorize a specific content in a meaningful way and also to promote, more casually, relevant reading comprehension skills. They are mainly made up of the following constituents:

1. **Concept:**

   A concept can be defined as a perceived regularity (or pattern) in events or objects, or records of events or objects, designated by label. Concepts are usually enclosed in circles or boxes of some type.

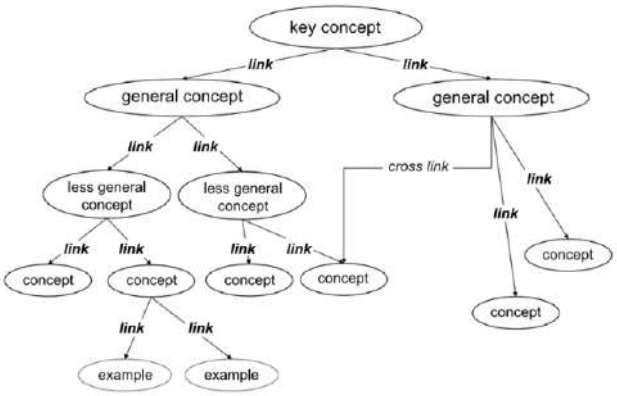
2. **linking words:**

   Words on the line, referred to as linking words or linking phrases, specify the relationship between the two concepts.

3. **Proposition:**

   Propositions are statements about some object or event in the universe, either naturally occurring or constructed. Propositions contain two or more concepts connected using linking words or phrases to form a meaningful statement. These connected terms can be read as a sentence, such as "India has democracy." These sentences—two terms linked by an arrow and phrase—are called propositions.

(Technical Report IHMC Campstools 2006-01 Rev 2008-01)



EFFECTS OF CONCEPT MAPS ON STUDENTS

Study by Novak and Gowin (1984) showed that the concept map method enables teachers to describe concepts that occur in certain texts and engage students actively in the learning process. Studies by Novak (2002, 2005, 2010) also showed that the use of concept maps in learning Science helped students to understand and organize Science concepts in a more meaningful manner and enhanced their understanding. Their findings also showed that students can organize complex concepts graphically by using the concept maps. In addition, Novak and Canas (2006) asserted that the use of concept maps can improve students' memory because through it, students can save the knowledge in an organized manner in their cognitive structures in the long term memory.

Effects of Concept Maps on Students' Interest in Learning Novak and Gowin (1984) stressed that the utilization of concept maps promotes positive self-concepts and positive attitudes towards learning. Several studies have also indicated that the utilization of concept maps enhances students' interest in learning. A research conducted by Isnawati (2000) showed that the use of concept maps increased university students' interest in learning Carbon Chemistry. A study by Tirumalar (2006) revealed that students have positive attitudes towards learning History after being taught using the concept map method. Similarly, findings by Kaur (2007) indicated that students' interest in learning literature components in the Malay Language was enhanced significantly when the teacher used the concept map method.

METHODOLOGY

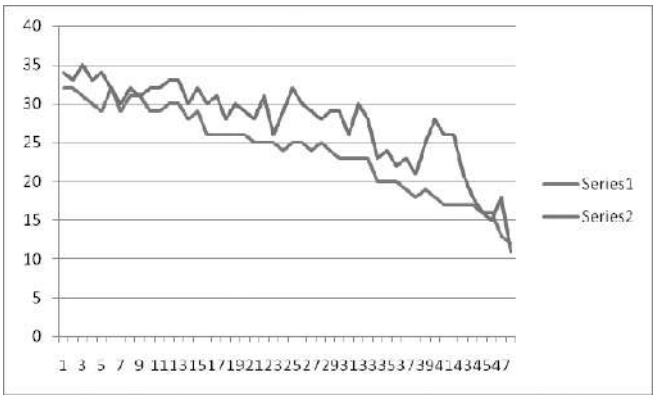
The researcher conducted a study on class IX students where in teaching he used traditional method of teaching and took pre test while after using concept maps he took post test. The scores of the both the tests were compared. The mean scores of 48 students in pre test and post test were compared and analysed using t test as follows.

Table 2: ***Pre and Post-test compression before collaborative concept mapping and after collaborative concept mapping***

Compared Group	Mean Score of Pre and Post Test	Standard Deviation	df	t-test	Result
Pre test	24.06	5.41	94	3.21	Significant at .01 level
Post test	27.62	5.44			

The calculated t value is more than table value which is significant at 0.05 and 0.01 level. Henceforth the null hypothesis that there is no significant difference between the achievement level of the students of different groups before collaborative concept mapping and after collaborative concept mapping." is rejected. Hence it can be concluded that CCM has a positive impact on the students understanding of concepts in social science.

This difference can also be illustrated with the help of a diagram as follows:



Diagrammatic representation of pre-test (series 1) and post test scores (series 2) of achievement test.

EPILOGUE

There are ample studies that show that there is positive impact of concept maps. Now if we talk about students with special needs, we find there several situations as mentioned in this paper, where we need to save students time, energy and make them feel interested and motivated. Concept maps based on

psychological theories proves itself effective in saving times and energy of all students with special need. Such maps are useful in teaching various concepts in effective manner.

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Application of Mindfulness Practices in Development of Children with Special Needs

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Abstract:

This article examines the usefulness of mindfulness practices in overall development of children with special need. Mindfulness is defined as the ability to regulate and control one's focus towards the present moment. Mindfulness practices of breathing, imagery, movement, reflection, and acceptance exercises are described along with research on the social, behavioral, and focusing attention following mindfulness interventions. Simple techniques of mindfulness that shifts one's attention to the present moment and the surroundings. The article concludes with practical considerations for special educators implementing mindfulness practices into curriculum, along with future directions for mindfulness in the field of special education.

Keywords: mindfulness, contemplative practice, attention

Mindfulness can be defined around two core components. It is the ability to regulate and control one's attention so that it is maintained in the moment, which allows for increased recognition of present events. It is also an orientation toward the present moment, characterized by curiosity, openness, and acceptance, even of negative or unpleasant experiences (Bishop, Lau, Shapiro, Carlson, Anderson & Carmody, 2004). Mindfulness refers to a state of awareness and a process of being attentive to and aware of events and experiences occurring in the present moment (Kabat-Zinn, 1994). It is described as "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" (Kabat-Zinn, 1994, p. 4). It is "an awareness of present experience with acceptance" (Germer, Siegel, & Fulton, 2005).

Simple mindful practices :

1. **Bell Listening Exercise:** Ring a bell, either a physical bell or one from an App or online, and ask the child to close his eyes and listen to the vibration of the bell. Tell them to raise their hand once the ringing stops and pay attention to any other sounds they hear for about another minute. This is a simple but powerful exercise that shifts one's attention to the present moment and the surroundings.
2. **Bedtime Mindfulness:** The child is asked to lie in his bed, close his eyes, and bring his attention to various parts of their body. Start at the toes and slowly move up to the head. Here are some scripts that you can follow: This is a calming method to return to one's body at the end of the day and develop a sense of gratitude for their body.
3. **Mindful Walks:** Stroll through your neighborhood in silence for a few minutes and ask the child to pay attention to all the sounds he hears. Then ask them to report back what he heard. You can also guide him to other sensations such as the breeze through his hair or the crunching of the leaves as he walks. If the child is particularly active, you may ask him to run or skip and notice his increased heartbeat or breath.
4. **Mindful breathing and meditation:** Ask the child to close his eyes and sit comfortably. Direct his attention to the sensation of breathing in and out. Ask him to put his hands on his stomach and feel the rise and fall of each breath. You can do this for about five cycles then guide him to any present feelings or thoughts. Tell him to observe his thoughts and feelings and let him go like a balloon. You can repeat this as many times as needed or possible.
5. **Soles of the Feet:** This technique was developed by researchers to manage anger and aggression. When faced with emotionally arousing situations, you can teach the child to redirect his attention and awareness to a neutral part of the body such as the soles of his feet. This technique helps calm and clear one's mind during stressful and arousing situations.
6. **Glitter Jar:** Fill a clear jar with water, some glitter, and glycerin or baby oil. A snow globe would be equally great for this activity. Particularly when your child is having a stressful day, ask them to shake up the jar and watch as the glitter settles after swirling chaos. This technique allows for a powerful metaphor that relates the internal state of the mind to a visual object.

Mindfullness helps in development of social and behavioral skills:

It is important for success in school as these skills may serve as a predictor of academic outcomes (Khudaverdyan, 2010S). Students' well-developed social and behavioral skills are known to facilitate development of a positive student teacher relationship as well as improved cognitive processing and

independent learning behavior, all of which are integral for academic motivation and success (Graziano, Reavis, Keane, & Calkins, 2007). Special Need students demonstrate consistently lower intra-personal skills and they experience greater difficulty with stress management when compared to their typically developing peers (Khudaverdyan, 2010). Diminished abilities in social and behavioral domains can negatively impact academic functioning, educational outcomes, and students' overall sense of academic self-esteem (Pang, 2006).

Mindfulness helps in Self Management Skills

Several studies suggest that increased ability for self control is achieved through participation in mindfulness practices. Mindful individuals show greater perseverance in the face of aversive experience than individuals who are less mindful (Tice, Baumeister, Shmueli, & Muraven, 2007). Research supports that exercising self-control seems to tap a limited regulatory resource. It is hypothesized that mindfulness restores the regulatory resource so that self control can be exerted with improved endurance (Posner & Rothbart, 1998; Schmeichel, 2007). With improved attention control students demonstrate increased self control (Bishop et. al, 2004). When more mindful, one can more accurately perceive the reality of a situation, and respond in a more adaptive and deliberate manner, decreasing impulsive behavior (Brown, Ryan, & Creswell, 2007). In this way, mindfulness allows students improved ability to exert volitional control, rather than rigidly adhering to old, habitual patterns. Individuals from a clinical sample who participated in a mindfulness program demonstrated improved abilities for self control and demonstrated less impulsive behaviors, corroborating evidence for positive effects on volitional control (Kristeller & Hallett, 1999; Lakey, Campbell, Brown, & Goodie, 2007). Additionally, students who engage in the acceptance portion of a mindfulness program and learn greater acceptance of unpleasant or negative circumstances, demonstrate increased ability for self-control (Hayes et. al, 1999).

The role of special educator is to modify curriculum to meet the different academic needs of their students, at the same time to provide useful support and bring noticeable change in students' social and behavioral domain. Within the field of education, classroom accommodation and management practices frequently address behavioral and attention skills by teaching self-management techniques (Roberts, White, & McLaughlin, 1997). In the last five years, medical and mental health fields have taken aim at this same goal, and have increasingly implemented mindfulness based practices into clinical interventions and wellness programs because of its positive effects on self-management (Baer, 2003). With these positive outcomes of mindfulness, attention has now turned to educational settings. Current research suggests that schools are ideal settings for introducing mindfulness techniques (Hooker & Fodor, 2008). Emboldened by empirical support, mindfulness programs used in other settings are beginning to be integrated into general educational classrooms with some promising results (Suttie, 2006). The Garrison Institute in New York - an organization that studies mindfulness in education - identified that within the last five years many schools are offering mindfulness training because it produces a more positive learning environment with students' primed to pay attention, and children become more focused, calm, and responsive as a result of participation.. Special education classrooms have not yet seen a full integration of mindfulness intervention into curriculum. Mindfulness practices affect social, behavioral and self management skills through the use of some combination of breathing, imagery, movement, reflection, and/or acceptance exercises. Mindfulness Based Stress Reduction (MBSR), developed by Jon Kabat Zinn, was one of the first mindfulness programs designed, consisting of 8-10 sessions and teaching adults mindfulness practices for stress reduction (Shapiro, Carlson, Astin, & Freeman, 2006). Mindfulness practices for children are often adapted from this model. Programs vary, but can consist of a combination of some or all five different components, including breathing exercises, visual imagery and meditation, movement, reflection, and/or acceptance exercises. Breathing exercises (including diaphragmatic breathing, alternate nostril breathing, and three part breathing) have been proven effective in helping individuals remain calm and focused when stressed and display less emotional reactivity (Arch & Craske, 2006). Visual imagery has been found to produce varied behavioral benefits, including improved engagement with activities (Behan, 2004), and has been identified as helping individuals experience greater well being, improved coping skills, and increased capacity to manage stress (Perlman, et al., 2010). Movement exercises (including deep bends, reaches, and yoga and Tai Chi stretches) produce calming effects on individuals, and have been implicated in improved attention and decreased levels of test anxiety (Glanz, 1994). Yoga and Tai Chi movement exercises facilitate the development of stress management skills and offer health benefits (Wang, Collet, & Lau, 2004). Reflection exercises (including exercises to increase awareness of feelings) are implicated in improved well-being (Yearwood & Riley, 2010), and finally, acceptance exercises influence improved mental health and self control (Flaxman & Bond, 2010; Hayes et. al, 1999). It is unclear why there has been so little integration of mindfulness practices into special education classrooms to date. It may be that quantifying and measuring the independent variables of mindfulness is a difficult task, however research as to the effectiveness and application of these interventions for special education students and the teachers who teach them has recently begun. One recent study of preschoolers who demonstrated gains in self-regulatory abilities following a mindfulness intervention, offers promise to the usefulness of a mindfulness program for special education students. The preschoolers in this study who were less self regulated prior to the intervention, made the most significant gains following participation in the program (Flook, et al., 2010). These findings offer promise to the usefulness of mindfulness interventions for students with limitations in social and behavioral skills. In considering the usefulness of a mindfulness program designed specifically for special education classrooms, the authors provide a review of the

extant literature to summarize what is already known about mindfulness. Over 40 studies were reviewed on the impact of mindfulness in clinical and educational settings. In the article that follows the definition of mindfulness is provided. Next, research related to mindfulness interventions' effects on the behavioral skills of self control, emotional regulation, and anxiety, along with social skills, and attention skills is presented. The article then concludes with practical considerations for special educators when considering incorporating mindfulness practices into their classrooms, and future directions for the field.

Mindfulness Effects on Social Emotional Skills

Elias (2004) states there are thirteen skills involved in social-emotional learning, which include recognizing emotions in self and others; problem solving and decision making; approaching others and building positive relationships; and help seeking and help-giving. Students with special needs commonly have difficulty with their social emotional regulation, particularly students with a specific learning disability, Autism, emotional disturbance, and/or other health impairment (Beauchemin, Hutchins, & Patterson, 2008). According to research by Carboni, Roach, & Frederick (2013), more than 50% of children diagnosed with attention deficit/hyperactivity disorder (ADHD) have experienced social difficulties. Students with special needs struggle with social behavior, social relationships, peer status, and classroom behavior. Negative classroom behavior, such as making inappropriate noises, being out of their seat, and blurting out, is a central contributor to lower levels of achievement. Although these students may be vocal more frequently than their typical peers (students without special needs), these students also tend to listen and respond to peers less, which can lead to unbalanced social interactions (Carboni et al., 2013).Because students with special needs may grapple with social-emotional regulation, they tend to not be accepted by their peers and demonstrate deficits in how they interact with peers and adults. They also have difficulty reading nonverbal and other social cues. Of course, the degree to which students with special needs exhibit these difficulties, and the types of social emotional difficulties, depends on the disability of each student. In spite of the social-emotional difficulties students with special needs encounter, mindfulness may enhance students' social skills (Beauchemin et al., 2008). A study by Rani &Rao (1996) assessed a group of 19 special education students who practiced mindfulness regularly as part of their school curriculum. Their findings indicated that these students exhibited greater attention regulation capacity than the students who did not practice mindfulness regularly (as cited in Carboni et al., 2013)Neurological evidence suggests that individuals who engage in mindfulness practices show more activation in those areas of the brain that detect emotional cues, demonstrating a heightened empathic awareness (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008). The ability to detect emotional cues is associated with improved social ability as students have a greater ability to read social cues and respond more appropriately. With a greater ability to access empathy, special education students may experience more satisfying friendships and improved social relationships in school. Research further suggests that students who participate in acceptance exercises as part of a mindfulness program, learn acceptance of even difficult thoughts and emotions, which reduces the threat potential these feelings have, and allows students to feel more calm and relaxed in social settings (Marck & Woods, 2005). These practices may also decrease students' reactivity to their own passing emotions, even when those emotions are challenging, and cause students to feel a greater sense of well being and an improved ability to relate to others. Evidence of improved social skills is also supported by a study of typically developing children in grades 1, 2, and 3 who participated in a 12-week program of breath awareness and movement exercises (two components of a mindfulness program), and who demonstrated improved attention and social skills (Napoli, Krech, & Holley, 2005)

Additionally, mindfulness techniques have been shown to improve parent-child relationships and significantly reduce parental stress, improve parental well being and overall health after just a few weeks. This parental change in behavior has the reciprocal effect of reducing stress and anxiety among their kids (Keenan-Mount, Albrecht, & Waters, 2016). In addition to parents, mindfulness training can allow teachers to better regulate their reactions to stressful classroom situations and manage the social, emotional, and educational needs of their students with Autism Spectrum Disorder (ASD). A five-week mindfulness teacher training intervention introduced stress management and relaxation techniques as well as the application of mindfulness techniques to teaching. The training not only improved teacher's self-efficacy beliefs but also allowed teachers to better cope with challenging situations (Benn et al., 2012).

Mindfulness Effects on Attention

Students in a mindfulness program were found to perform better than a control group on a counting task requiring sustained attention. This difference corresponded to the number of years of mindfulness participation (Valentine & Sweet, 1999). Several studies of attention have been conducted employing the Stroop task (a task of selective attention requiring the inhibition of an automatic response of reading, in favor of naming the color a word is printed in) to compare the attentional capacities of mindful versus less mindful individuals. Students given a brief mindfulness intervention performed better on the Stroop task than controls (WenkSormaz. 2005).esearch suggests that mindfulness can be linked to enhanced academic achievement and self-awareness in preschool-aged children. Thierry et. al., (2016) conducted a two-year study regarding the effects of mindfulness practices on pre-kindergarten children; the findings suggest that the children in the mindfulness intervention group had increased social competence Other studies also support these findings, reporting that individuals with experience in mindfulness have been shown to perform better on the Stroop task than those without experience (Rani &Rao, 2000). Research found that children who practiced a

mindfulness meditation exercise over 18-weeks improved their ability to focus and refocus their attention, and to disregard distracting stimuli when compared with children who had received counseling once a week, and a control group who received no intervention (Linden, 1973). Further, a 2005 study reported that individuals with long-term participation in mindfulness practices demonstrated thicker cortical regions related to attention and sensory processing when compared with controls (Neuro Report, 2005).

Mindfulness Effects on Academic.

In addition to aiding students with special needs' social-emotional regulation, mindfulness can also improve students' academic performance. When students are challenged with social-emotional regulation, their academic performance is hindered. As mentioned previously, students may display inappropriate classroom behaviors, such as blurting out. When this occurs, students often times receive consequences (e.g. office referrals) which result in loss 15 of instruction. The lost instructional time intensifies achievement gaps and may reinforce the exhibited negative behavior (Martinez & Zhao, 2018). However, when mindfulness is integrated into the classroom setting and practiced regularly, social-emotional regulation can be improved, which in turn contributes to academic improvements.

Incorporating mindfulness curriculum into the school day can be an extremely practical way to target special education students' social and behavioral skills, and to provide teachers with tools for classroom management. Special educators may consider whether and how mindfulness practices are in keeping with their teaching goals and philosophies. When doing so, authors offer these practical considerations:

Practical Considerations for Special Educators

1. Mindfulness curriculum is practical and safe, as the tool for this curriculum are internal, including breathing, imagery, reflection, acceptance, and movement. Teachers must assess whether they have the appropriate level of knowledge and competence to modify facets of the interventions to meet the specific needs of their classroom. Teachers might consult the current literature, form study groups, join contemplative practice visit websites designed for educators using mindfulness. Mindfulness apps are available that can help teachers develop breathing or meditative practices for themselves that they may integrate or model in the classroom.
2. Because of the internal nature of the intervention, students' skill acquisition may be generalizable, and skills can be transferred to use at home, in the school yard, or in other areas outside of school.
3. Special education initiatives and legislation require empirically supported educationally practices to be implemented in our classrooms. Mindfulness is supported by a body of research which asserts its positive effects; however, there is very little research investigating how special education teachers can best use it in schools. Special educators, with the support of school administration, should evaluate whether they feel it is appropriate for use in their classrooms, and may consider pre and post-test measures of students' social, behavioral, and attentional skills to evaluate its effectiveness.
4. Mindfulness curriculum does not require additional space as these practices can be conducted in the classroom. Students should be comfortably seated in chairs or on the floor to engage in practices. Teachers may consider the best way to implement these interventions based on classroom configuration and the needs of students.
5. Mindfulness practices can be used as part of a daily routine requiring several minutes, or can be incorporated into curriculum taking more time, based on time available and student/teacher schedules. Teachers may consider how much time they can allocate to these practices based on their goals for the intervention and their scheduling demands. For instance, mindfulness practices may be incorporated into the curriculum following the lunch period a time in the day where teachers generally make repeated attempts to help students smoothly transition from free time to academic time, or at the start of each day to create a classroom climate of openness, acceptance, and attention to task, if these times are in keeping with teachers' goals and schedule.
6. Teachers may consider using mindfulness as part of a classroom management program, to proactively equip students with emotional regulation strategies for dealing with stress. It can be utilized to influence classroom climate and can empower students with increased coping skills for use at home and in other settings. It is important for special educators to evaluate whether they feel comfortable utilizing these interventions, in that, teachers must participate along with students and would be expected to model its use in the classroom. Mindfulness teaches students concrete strategies to improve their ability to cope with emotion-laden stress, teaching them an awareness of their own mind-body connection through the integration of physiological (breath support, diaphragmatic breathing, visual imagery), psychological (reflection), educational (acceptance), and physical (movement) approaches (Kabat-Zinn, 1994). Special educators would have to feel comfortable using an integrative approach in their classrooms for implementation of a mindfulness program. Teachers would also need to make modifications to the intervention for students' varied physical, intellectual, and emotional ability.
7. Classroom climate and parent support can be positively affected by mindfulness practices. Over eighty percent of typically developing students and their parents who participated in a mindfulness pilot study endorsed mindfulness training, reporting that they believe schools should teach mindfulness (Lee, 2008). Special educators would need to develop an introductory knowledge of mindfulness practices in order to educate students and parents as to its use in the classroom. Teachers might also

consider communicating with parents during the implementation of mindfulness practices to assess parents' response. Future Directions and Conclusion Mindfulness interventions are beginning to be utilized in general education classrooms with promising results in social, behavioral, and attentional domains (Elias, 2009). This article supports the expansion of these practices into special education classrooms, and presents research that purports positive effects on skill sets important to the education of special education students. Research may also explore teachers' reactions to its use in the classroom, effects on classroom climate, and the relative effectiveness of each of the five mindfulness strategies. With empirical support and qualitative inquiry, a mindfulness program may be designed specifically for use with special education students to address their diverse needs and strengths. Extending and applying findings from the research reviewed in this article, mindfulness practices holds promise for use in special education classrooms. Special educator training in this area has only just begun with limited implementation in special education classrooms, such that research to evaluate the particular application in special education classrooms is needed. Special education students are often in classrooms where there is more than one adult in the classroom because of the presence of support staff, para professionals, and through the practice of team teaching. Research suggests that having more than one adult in the room facilitating mindfulness intervention exercises, increases the benefits and strengthens the students' acquisition of skills while supporting the development of a warm and safe classroom climate (Wall, 2005). Taken together with the need to support special education students in social and behavioral domains, this suggests that special education classrooms may, in fact, be a good setting for mindfulness intervention. Additionally, research asserts that mastery of mindfulness curriculum is much less necessary than a working command of the skills, in providing students with a rich learning experience and in affecting classroom climate (Wall, 2005), suggesting that teachers and support staff who learn the curriculum need not be experts to help students experience the beneficial outcomes, and that students need not be proficient in mindfulness in order to experience positive results. Based on our current understanding of mindfulness, these interventions may produce positive outcomes without requiring teachers and students to become expert in the intervention, and may contribute to a classroom climate that is characterized by students who are supported, primed to pay attention for new learning, and able to cope more effectively with school-related stress.

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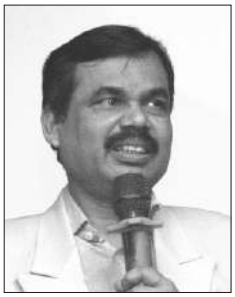
Hydrotherapy



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Hydrotherapy, also known as aquatic therapy, is water-based exercises that help improve a person's physical abilities and functions. It's been hailed and approved by the medical community as a way to help heal the body, especially for children with cerebral palsy.

In fact, aquatic therapy is particularly beneficial for children with cerebral palsy since it allows them to move freely without putting stress or much weight on their bodies (water reduces weight by 90%).

Aquatic therapists generally have several goals when working with children with cerebral palsy, including helping kids to:

- Develop more muscle control
- Increase self-confidence
- Improve strength and physical function
- Gain more life independence

Benefits of Aqua Therapy (Hydrotherapy)

Aqua therapy (Hydrotherapy) offers a myriad of physical and mental benefits to children with cerebral palsy. Physical benefits include:

- Improving heart function
- Increasing resistance
- Relieving and reducing pain in the joints and muscle
- Helps protect against injuries while exercising
- Reduces discomfort while exercising
- Helps build muscle and muscle control
- Help build better circulation
- Improve endurance and flexibility
- Mental and emotional benefits include:
- Improved confidence and self-confidence
- Better quality of life
- Better socialization skills
- Improved sensory integration
- Improved sense of independence

Types of Aqua Therapy (Hydrotherapy) Exercises

There are an array of different types of aqua therapy programs and exercises, but the one best suited for your child will depend on the severity of his/her disorder, age, physical fitness level, and any associated illnesses or disorders.

In general, the popular forms of aqua therapy (Hydrotherapy) exercises include,

- Swimming (at all levels, including learning to swim)
- Aquatic yoga
- Water-based range of motion exercises
- Balance exercises via flotation devices in deep water
- Breath control exercises
- Assisted walking exercises
- Deep water walking
- Social games to help improve social interaction, eye contact, and sportsmanship

Equipment used during a typical aqua therapy session may include:

- Flotation devices
- Toys
- Weights
- Compression vests
- Balls

Pools Used For Aquatic Therapy (Hydrotherapy)

Safety should be of primary importance for therapists and other professionals who help children with cerebral palsy. In turn, the majority of pools is generally smaller than standard size pools and come with:

- Fiberglass or stainless steel shells
- Built-in attached equipment
- Safety rails and ladders
- Thermostat to warm water
- Easy-to-grip edges

In general, physical and occupational therapists that are trained in aquatic therapy provide services to children with cerebral palsy.

Sessions times will vary depending on the child's individual needs, but will generally anywhere between 30 to 45 minutes. Children usually need to bring swimsuits, towels, and swimming shoes to each session, although some classes may provide these items depending on the program and the family's financial status.

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The effectiveness of assistive technologies for children with special needs: A review of research-based studies:

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Assistive technologies are often promoted to schools, parents and educators as tools to assist students with special needs by providing a compensatory value, to remediate learning problems and to promote personal independence. These technologies range from simple spell checkers to more complex speech recognition systems and educational software. Many research projects have examined the effectiveness of these assistive technologies primarily in terms of their remediation and assistive functions. This paper describes the results of a systematic search of research-based studies published in the last six years that examined the effectiveness of assistive technologies that have reading, writing, spelling and speech as their focus. After a rigorous process, 15 empirical research articles were selected based on the following criteria: empirical studies involved students who identified as having special needs; the assistive technologies had a literacy and speech focus; participants were in years K12; and a clear skill or academic improvement was shown. Findings revealed that while some programs saw no improvement in spelling, reading or writing as a result of using the assistive technology, the majority of studies found consistently.

Introduction

The heightened interest in the use of assistive technologies for students with special needs can be traced to legislation introduced in European and North American countries in the 1980s and 1990s. For example, the Technology-Related Assistance for Individuals with Disabilities Act of 1988 in the United States (US) brought increased attention to the role of assistive technology (AT) to improve the performance in education, work and social life of persons with disabilities. In the United Kingdom (UK), the Disabled Student Allowance (DSA) of 1993 sparked research on the types of technology that could improve the performance of disabled students in a variety of tasks. The 1997 US Act, Individuals with Disabilities Education Act (IDEA), mandated that AT be considered for each student with a disability when developing an individualised education plan. Alper and Raharinirina (2006) contend that despite the legislation in place, little is known about the specific issues associated with AT, its uses and for whom it is appropriate. This paper will review literature from 2004 to 2009 in an attempt to determine if more recent research has illuminated the best use of AT and for whom it is appropriate. Focusing only on research studies on spelling, reading, speech and writing, this paper describes the results of a systematic search of empirical studies that appeared in international, refereed journals from 2004 to mid-2009. When examining the literature of the last six years, 15 articles were found that met our criteria. Ten studies were located in the US and the remaining five were in Canada, Ireland, Israel, Sweden and Norway. Most of the articles were in one journal, Journal of Special Education Technology, because it attracts researchers in the area of special education and the use of technology. The term AT is generic and used to describe assistive, adaptive and rehabilitative devices for people with varying degrees of disability. Essentially, these technologies are aimed at assisting or expanding human function or capabilities (Lane and Mann 1995). ATs can range in complexity from sophisticated computerized communication systems and software programs to a simple handle on a telephone. This review adopts as its focus software-based technology and seeks to examine how these are used to aid children, with varying special educational needs, in primary or secondary educational environments. There are many questions a review could try to answer; however, because of the wide variety of studies found in these journals, we decided to focus on two basic questions. What types of technologies were used in these studies and what has been their impact on students with learning difficulties? The description of the technology is found in Table 1, along with the geographic location and the participants in the studies and the type of research design. Our review looks at the purpose of the study or the research question asked and the outcomes. It organises this information based on the technology utilized so that we can answer our two basic questions.

Review of meta-analysis studies

In reviewing the research on ATs, we identified five articles that synthesized the literature in an attempt to identify its benefits and the obstacles to its use. Edyburn's (2000) review was one of the first to examine the literature that was contributing to this emerging knowledge base on special education technology. He found that most of the relevant literature appeared in 12 journals and a core set of four journals contained 60% of the relevant articles. He surveyed the

literature from 26 journals in 1999 and found 788 articles of which 114 contributed to the knowledge base. In another comprehensive review of articles published in English between 1988 and 2003 that provided an assessment of skill acquisition using AT, Alper and Raharinirina (2006) found 60 articles that met their criteria. Using a content analysis, they summarised their findings in 12 categories. Most of the studies were conducted to investigate the effectiveness of the use of AT in improving participants' skills. A variety of AT devices were utilised. The difficulty of synthesising the findings was evident based on the different types of AT devises, different age groups, different settings and different types of skill acquisition and differing special needs (including learning and physical disabilities). In a synthesis of studies that examined spelling and reading interventions and their effects on the spelling outcomes of students with learning disabilities, Wanzek.

Assistive technology and students with special needs

According to the Individuals with Disability Education Act (IDEA) in the US, any equipment that is used to improve functional capabilities of individuals with disabilities is considered AT. In the US, the approach to AT is inclusive. It includes not only the technological devices or software that assists the learner with disability, but also all the raft of services and professionals, teachers and family members who support the student to ensure greater outcomes. Furthermore, according to the IDEA, the selection, acquisition and or use of AT is dependent on the evaluation of the needs of the child. With the importance of the appropriate use of AT, there is a clear need for an adequate level of expertise of at least one of the team members who is working with the students with learning difficulties (Bausch et al. 2008). For the purpose of this review, we have chosen to only include technologies that assist children in primary or secondary educational environments. We were concerned with examining how these technologies assisted children who experienced a range of special needs and were having difficulties with reading, speech, spelling and/or writing. 290 D. Maor et al. Downloaded by [Murdoch University Library] at 23:39 06 October 2013 The majority of the studies focus on children with mild learning disabilities defined by Edyburn (2006) as: a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations, including conditions such as brain injury, dyslexia and developmental aphasia. (18) One study falls within Edyburn's (2006) category of emotional/behavioural disorders. This was a study on children with autism and falls under the category 'An inability to build or maintain satisfactory interpersonal relationships with peers and teachers' (18). Another study falls within his category of 'mental retardation', meaning 'subaverage general intellectual functions' (19). Specifically, this is a clinical term and refers to individuals who score below 70 on intelligence tests and have limited intellectual abilities (Medicine.Net 2010). Hereafter this group of individuals will be categorised as 'intellectually impaired'. Two studies were with children with physical disabilities and would fall under the category of severe disability. They included cerebral palsy and spinal bifida. Edyburn (2006) identified that most of the students in the US receiving special education services have mild disabilities (approximately 69% of the students with disabilities aged 621 fall into this category)

Method

The purpose of this paper is to provide an updated literature search on empirical research studies that provided some type of AT intervention with students who had special needs. The search process can be illustrated as follows:

Analysis of the reviewed studies

The main purpose of these studies was to assess the efficacy of interventions as a means of improving the reading, spelling, writing and speech ability of primary or secondary school students. Most studies used some type of intervention with students who either had physical or cognitive disabilities and used pre and post tests to determine the effectiveness of their programs. For example, one study analysed the results of using particular software, such as Co:Writer, and compared this with handwriting. Most had control groups so that they could make comparisons with the experimental group; however, there were also studies based on a small number of students using case studies or interviews. Table 1 lists the 15 studies alphabetically and gives the date and journal of the refereed article. It then gives the country where the study was located and the age or grade of the students and the number of participants in the study. It briefly describes the AT used, the design of the study, the type of disability of the students and the outcomes. The studies analysed will be referred to by their number as it appears in Table 1. In an attempt to compare study outcomes to give a sense of whether the field has moved forward in identifying which AT is the most effective, we have grouped the studies under the type of skill they are trying to improve. It is difficult to group these studies under just one heading as most try to tackle at least two different skills simultaneously. We begin with ones that looked at spelling and writing, then European Journal of Special Needs Education 291 Downloaded by [Murdoch University Library] at 23:39 06 October 2013 look at those that combined spelling and reading. We next look at one that combined spelling, reading and writing, and finally chose one that looked at an isolated skill such as writing or speech. Within these categories, we group those that used the same software although there were very few. The next section gives a fuller description of the research question and outcomes of these 15 studies, grouped under the skills tested.

Spelling and writing

At least three of the studies used Co:Writer, sometimes in conjunction with other software. Co:Writer is a software program designed to provide spelling and writing assistance, and its primary feature is word prediction. It also has 'flexible spelling', whereby words are predicted from phonetic spelling

and the option of creating topic dictionaries of specialised words (Mirenda, Turoldo and McAvoy 2006). The students in two of these studies (13, 15) had physical disabilities and the students in the other study (2) had learning disabilities and mild intellectual impairment. Using multiple software programs (Write: Outloud and Co:Writer), study (2) asked: How well do seven students with special needs perform in writing with a talking word processor with spellchecker software (Write:Outloud) when it is used independent of and in conjunction with word prediction software (Co:Writer)? They found that the group mean for number of misspellings decreased and their accuracy percentage, number of words and rubric scores, all increased. However, the effects on writing when using a talking word processor with or without word prediction did not appear to yield uniform outcomes or experiences across students. Using Co:Writer, study (13) examined two questions: What are the perceptions of students with physical disabilities and their adult supporters about the benefits of using a word prediction program such as Co:Writer? Are there significant differences in the rate of text entry, the properties of legible words, correctly spelled words, correct word sequences and/or the mean lengths of consecutive correct word sequences produced by students with physical disabilities using handwriting, word processing and word processing + word prediction software? Co:Writer enhanced spelling accuracy, both word processing and Co:Writer resulted in significantly more legible writing samples than handwriting, and word processing use (with or without Co:Writer) helped to improve legibility. In sum, Co:Writer had a positive impact on writing quality in comparison with both handwriting and word processing, as measured by the percentage and mean length of consecutive correct word sequences. Study (15) examined the use of Co:Writer to increase typing speed (included as a form of writing) and to decrease spelling errors for four students who had physical disabilities that affected hand use. Student attitudes about the effectiveness of word prediction were examined as well as their typing rates and spelling accuracy. Co:Writer had a small positive effect on overall typing rate and decreased spelling errors for two out of four students. However, two other students did not show an improved typing speed. Improvement in spelling occurred with two students who had the most severe disabilities.

Spelling and reading

Four articles used software interventions to improve reading and spelling. The first one (5) was with a group of 52 young Norwegian below-average readers and spell292 D. Maor et al. Downloaded by [Murdoch University Library] at 23:39 06 October 2013 ers using MultiFunk, a computer program designed to assist reading. The software is based on individual adaptation of text appearance on screen and auditory-visual reading support. The main research question was: does MultiFunk with a synthetic speech component show positive effects on reading and spelling development with this group and allow them to keep up with their classmates? In an experimental pre-test-intervention-post-test design, the authors found that the MultiFunk experimental group increased their reading and spelling skills significantly more than the control group. More specifically, they found that MultiFunk enhanced word reading rate, reading comprehension and spelling. The second study (7) assessed the effectiveness of two programs developed by the Frostig Centre Research Department in California: a computer speech recognition-based program (SRBP) and a computer and text-based automaticity program (AP) with 28 students with reading and spelling learning difficulties (aged 8 to 18). The SRBP program had a bimodal presentation of text. The child hears the word he or she has just spoken and sees it immediately on the computer monitor. When an error is made, the child must then find the correct word among a list of similar words and choose it, requiring the child to discriminate and compare words that look and sound very much alike. In this program, children are allowed to write on topics of their own choosing and proceed at their own pace. AP was developed to improve rapid naming and sight-word reading efficiency. After adjusting for age and IQ, both SRBP and AP groups (28 students) showed significant differences over the control group (16 students) in improving word recognition and reading comprehension. Neither program showed significant differences over contrasts in spelling. The next two studies (9 and 10) were written by researchers in the US and Northern Ireland. Starting with study (10), they assessed four software tools: speech synthesis, spellchecker, homophone detection using Read & Write Gold (Version 6) and SpeakOUT, and an electronic dictionary. The two homophone tools, Read & Write Gold and SpeakOUT, highlight same-sounding words in a document and show options with their definitions. The user may then choose an option that matches the context. The electronic dictionary allows users to find meanings for unknown words by highlighting the word and clicking on a dictionary icon. They matched their sample of 31 students using the AT with a group of 39 students using MS Word control and another group of 23 who were a control group with no assistance. Groups were matched on IQ, reading ability, spelling ability, computer exposure and socio-economic status. The study demonstrated several advantages of using Read & Write Gold for those with reading difficulties. It improved reading comprehension and homophone error detection and correction. Using the dictionary tool assisted the two groups over the full control group in finding more meanings for difficult words. Study (9) intervened using the homophone tool in Read & Write Gold (Version 7.1) in conjunction with Microsoft Word with 56 UK students to proofread passages. They were able to extend their previous study to discover how the software functioned to improve results. This study found that highlighting homophones helps improve performance and that offering the homophonic options adds a significant additional benefit.

Spelling, reading and writing Study

(8) investigated the use of a word processor for enhancing the academic outcomes of three junior high school students with writing disabilities in Israel. They European Journal of Special Needs Education 293 Downloaded by [Murdoch University Library] at 23:39 06 October 2013 found that the use of word

processing meant that they made fewer spelling mistakes, used more organisation and structure and made fewer reading errors when reading their own written exercises.

Reading only

Study (12) used a more robust research design than study (8). Its 6th and 7th grader participants were a group of 27 students who received a treatment program and a control group of 15. They used phonics-based computer assisted instruction (CAI). The treatment group showed greater reading gains than the control students on word attack, a measure of decoding skills, and a trend toward greater gains on real word reading (Letter-Word Identification). Both groups showed strong gains on passage comprehension. Study (6) took place in Sweden with 80 children in grades 2 and 3. These children were identified as having a reading disability that was the result of either phonological or orthographic word decoding problems. The children took part in computerised training programs to address their phonological (COMPHOT) or orthographic (DOT) issues. The COMPHOT program had rhymes, addition, position and segmentation and included exercises with pictures that participants could click on and get the word sounded. The DOT program provided explicit links between letters, written words and sounds and was based on word reading, text reading, word parts and building words. A child could typically click on a word and have it sounded out by the computer. The children who had the phonological and orthographic training programs were compared with 20 children who received ordinary special instruction and 34 normal readers. Children with phonological problems improved their general word decoding skills more than did children with orthographic problems.

Writing only

Two articles came from Michigan State University researchers (3 and 4) in the US. Study (3) used Technology-Enhanced Learning Environments on the Web (TELEWeb), a program that provided customisable activities and tools that could be individualised to meet diverse student and curricular goals. The findings showed the potential for strategically supported web-based environments to offer cognitive resources to very young students. The TELE-Web scaffolds seemed to influence three writing outcomes: the quantity that students wrote, the ability to elaborate with topically related details and generate more textual ideas that happened to be better organised. Study (4) investigated the effects of scaffolding students' writing performance through the employment of two different conditions that were exactly similar with the exception of the online scaffolding of students' writing performance. Speech only Study

(1) investigated video modeling to increase variation in the conversation of two boys with autism in California. The study systematically assessed the effects of video modeling on increasing responses in conventional speech and measured any changes in the children's social behaviours and their amount of question-asking in unstructured free play sessions. The results suggest that video modeling can be an effective technology for teaching children with autism to vary their conversational speech in order to speak with several people on a variety of topics

Discussion

Several limitations of this review should be considered. The articles chosen for analysis were only in English and were restricted to papers published in referred journals between the years 2004 and 2009. Only studies that showed some skill or academic improvement were included and the study took as its focus a diverse range of special needs. This diverse ability sample was the consequence of the limited explicit identification of disability in many of the studies. As Edyburn (2000) has noted, the explicit identification of a specific disability is less common in research of this nature as much of the AT is generic and therefore useful for individuals with a range of abilities. Even in this restricted area of research on reading, spelling, writing and speech, these 15 articles used quite a range of different types of technology. This makes it difficult to determine which technology is the most efficacious because there are few studies that utilised the same technology with students in the same age groups. In addition, the AT was used with students who had different types of disabilities. Some studies used small samples, lacked adequate control groups or did not have any control groups. Nevertheless, the majority of these studies indicated that AT was beneficial in increasing the literacy and speech abilities of these students. In almost all of the studies, whether experimental or case studies, the students increased their skills in the areas tested. None of these studies followed students over several years to see if the benefits of AT were maintained after the intervention program ceased. In the future, it may be important to develop longitudinal studies to track students over a period of time to see if they can maintain the literacy and speech skills that they have learned. As was found in the literature review, Wehmeyer et al. (2008) emphasised that most of the research they analysed was done with basic assistive technology software and not with 'cutting edge' technology that may have an impact on students' learning. Several studies used a combination of AT that provided more information about the effectiveness of different software in providing feedback to children with special needs. European Journal of Special Needs Education 295 Downloaded by [Murdoch University Library] at 23:39 06 October 2013 Some studies noted the need for the ATs to have special attributes to work well with students having learning disabilities. The technology needs to have screen readability for students to embrace the program. Speech feedback also increases the communicative aspect of reading and enhances a sense of mastery. Contextual reading with short summaries may also increase motivation. These ideas led to the design of one of the software programs mentioned above, MultiFunk (multimedia and multi functionality), which is based on individual adaptation and auditory-visual reading support (Fasting and Lyster 2005). This concept of universal design for learning emphasises that students have individual differences and instruction should embrace the differences. Thus, another design attribute that AT should incorporate is the accommodation of individual students' needs. Only two of the

studies (Charlop, Gilmore and Chang 2008; Tam et al. 2005) in this review considered the support of family members in using ATs.Alper and Raharinirina (2006) noted that the lack of family support is a main reason for the abandonment of the ATs over the longer term. All of the following contribute to this problem: a lack of consideration of the child's and family's needs; no consultation with the family before choosing an AT; complicated design; prohibitive cost; and lack of technical support.

Conclusion

With the rapidity that technology changes, it is difficult for researchers to keep up with new technology that could assist students in the areas of reading, spelling, writing and speech. For example, there are likely to be new developments using Web 2.0 technology, but no studies were found using this latest technology. Continued research in the area of ATs is essential with the explosion of new technologies. The research should focus on specific research questions and be more systematic in trying to answer these questions, ensuring that the research uses an empirical design with enough participants that can enable it to produce valid and reliable results or qualitative studies which are theoretically sound and have rigor and authenticity. Considering the high level of investment that educational authorities around the world are making in ATs, the small number of studies that had adequate research design features was quite surprising

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Application of Assistive Devices in Education of Children with Special Needs

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Abstract

Assistive technologies are often promoted to schools, parents and educators as tools to assist students with special needs by providing a compensatory value, to remediate learning problems and to promote personal independence. These technologies range from simple spellcheckers to more complex speech recognition systems and educational software. Many research projects have examined the effectiveness of these assistive technologies primarily in terms of their remediation and assistive functions. This paper describes the results of a systematic search of research-based studies published in the last six years that examined the effectiveness of assistive technologies that have reading, writing, spelling and speech as their focus. After a rigorous process, 15 empirical research articles were selected based on the following criteria: empirical studies involved students who identified as having special needs; the assistive technologies had a literacy and speech focus; participants were in years K12; and a clear skill or academic improvement was shown. Findings revealed that while some programs saw no improvement in spelling, reading or writing as a result of using the assistive technology, the majority of studies found consistently improved outcomes

Keywords: assistive technologies; special needs; literacy; K12; empirical studies

Introduction

The concept of inclusive education has brought with itself the much needed share of equality in approach for the education of the 'disabled' by giving them a leveled field to rightly exhibit their differential abilities, proving themselves capable enough to learn and perform together, at par with their non-disabled peers. And with this shift in approach, there also emerges the need and challenge to tailor the teaching strategies or the means of instructional delivery in the inclusive classrooms, to address the diverse learning needs of all learners in an equitable manner. Acknowledging the capabilities or 'differential abilities' of all learners, the education of children with special needs in inclusive schools becomes more of a shared responsibility between the different stakeholders involved (Praisner, 2003); demanding a shift in attitude, availability and accessibility of infrastructure, pedagogy, need-based methods and materials for instructional delivery, assessment and evaluation; and the much evident issue of acceptance and accommodation at all levels in the education system (Ahmad, 2014; 2015b; Stainback and Stainback, 1984). Addressing the individual learning needs of all children, youth and adults, with a specific focus on those vulnerable to marginalization and exclusion; inclusive education as an approach implies all learners, with or without disabilities, to be able to learn together through access to common pre-school provisions, schools and community educational setting with an appropriate network of support services, which can be possible only in a flexible education system that assimilates the needs of diverse learners and adapts itself to meet these needs, ensuring that all stakeholders in the system are comfortable with diversity and see it as a challenge rather than a problem.

Researches on inclusive education, have predominantly focused on the success stories of inclusion in developed countries in North America and the Western Europe, that have made significant progress in inclusive education (Arnsen and Lundahl, 2006; Ferguson, 2008; Gr¨onlund et al., 2010; Kearney and Kane, 2006; Meijer et al., 2007; Norwich, 2008); however, the status of inclusive education in the developing countries in Africa, Asia and the Eastern Europe, typically highlights difficulties in the implementation of inclusive education (Charema, 2007; Chitiyo and Chitiyo, 2007; Singal, 2006). Among the prevalent barriers to the successful implementation of inclusive education like - limited governmental support, ineffective policies and legislation, inadequate funding, insufficient trained teachers and support staff, political instability, and economic crisis; the ineffective and inefficient use of assistive technologies is seen to be a major obstacle hindering inclusion (Chitiyo, 2007; Ellsworth and Zhang, 2007; Gr¨onlund et al., 2010; Singal, 2008).

Students with disabilities are found to be frequently trapped in a vicious cycle of exclusion from education, society and mainstream development programmes due to lack of necessary support and the means for equal participation (Ahmad, 2015a). Effective technology integration can help provide all learners the ability to access the general education curriculum, offering them multiple means to complete their work with greater ease and independence in performing tasks that they were formerly unable to accomplish, or had great difficulty in accomplishing (Roberts et al., 2008; Van, 2007);

thus addressing the 'functional barriers' by increasing, maintaining, or improving their learning outcomes in a diverse world of abilities and expectations.

Use of Assistive Technology in Inclusive Education - Making Room for Diverse Learning Needs

"The real miracle of technology may be the capacity it has to remove previously insurmountable barriers faced by persons with disabilities" (Simon, 1991).

Technology has great potential in providing access for all learners, and the ability to access the general education curriculum. Assistive technology is a generic term that includes assistive, adaptive, and rehabilitative devices for individuals with disabilities and includes 'virtually anything that might be used to compensate for lack of certain abilities' (Reed and Bowser, 2005), ranging from low-tech devices like crutches or a special grip for a pen, to more advanced items like hearing aids and glasses, to high-tech devices such as computers with specialized software for helping dyslexics to read (WHO, 2009). Also known as 'technical aids', or 'assistive equipment', including information and communication technologies (ICT), universally designed technologies, educational technologies, emerging and innovative technologies, and accessible technologies; they can be 'any item, piece of equipment or product system that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities, and help them to work around or compensate for a disability' (Goddard, 2004: p.2), in order to participate in the activities of daily life. From a simple device like a magnifying glass, to a complex computerized communication system; depending on their nature of use and application, assistive technology devices can be used by students with disabilities on their own or with assistance, in and outside the learning setup. Some of the examples of assistive technology devices are - touch control devices, alternative keyboards and mouse, speech-to-text word recognition tools, word prediction programs, word processors, grammar checkers, scanners, compact disc recording (CD-R and CD-RW) drives and spell checkers (Petty, 2012).

Approaches in the use of assistive technology in inclusive education focus on using technology to train or rehearse, and to assist and enable learning. A large population of 'at risk' students are seen to need assistance, but since they often don't easily fit into a diagnostic profile, they often lack assistance. Assistive technology serves in bridging this gap by 'assisting' in the practice of educating children in the same classroom, including children with physical, mental and develop- mental disabilities (Smith et al., 2005); helping them to learn the material in a way that they can understand, by eliminating barriers that had been preventing them from being at the same level as their peers.

Offering practical tools for application of the principles of cognitive theory to teaching and learning, assistive technology connects a student's cognitive abilities to an educational opportunity that may not be accessible due to a disability; like a student facing difficulty in decoding text can make use of a text-to-speech screen reader as a 'bridge' between the written text and the ability to process the information aurally and cognitively; while a student who has difficulty sequencing thoughts in text can use graphic outlining software as a bridge to visual processing skills (Hern´andez, 2003).

Table 1: Use and Application of Assistive Technology in Education

CATEGORY/ AREA OF FUNCTION	ASSISTIVE TECHNOLOGY APPLICATIONS	NEED AND RELEVANCE IN CLASSROOM LEARNING
Reading	Electronic books, Book adapted for page turning, Single word scanners, Predictable texts, Tabs, Talking electronic devices/software, Speech Software	For students having difficulty in reading and understanding written text and in paying attention to the reading assigned
Writing	Pen/Pencil grips, Templates, Word processors, Word card/book/wall, software, Spelling /Grammar checker, Adapted papers	For students having problem in writing or composition
Math	Calculators, Talking Clocks, Enlarged Worksheets, Voice Output Measuring Devices, Scientific Calculators	For students having computational problems and confusions, and finding it difficult to perform well in Math lessons
Vision	Eye glasses, Magnifier, Screen Magnification, Screen Reader, Braille Large Print Books, CCTV, Audio Lesson Tapes	For students having difficulty in seeing or lack complete vision
Hearing	Hearing Aids, Pen and paper, Signaling Devices, Closed Captioning	For students who have difficulty in hearing or are absolute hearing impaired
Computer Access	Word prediction, Alternative Keyboards, Pointing Option, Switches, Voice recognition software	For students finding it difficult to access the computer in its standard form and have difficulty in performing academic tasks

Augmentative/ Alternative Communication	Communication Board, Device with speech synthesis for typing, Eye gaze board / frame, Voice output device	For students having problems in comprehension of language, and lacking the ability to express it, or are unclear in speech and demonstrate delayed expressive language
Learning Disability and Attention Deficit Hyperactivity Disorder (ADHD)	Use of applications / devices depending upon the degree of disability/difficulty, in the area of reading and writing (Dyslexia), handeye coordination, written expression and composition (Dysgraphia), difficulty in fine motor skills, Coordination (Dyspraxia), Math (Dyscalculia) and Attention (ADHD) like - Talking electronic devices, Calculators, Electric Organizers, Highlighters, Pencil Grips, Post-its, Computers,Spelling/ Grammar Checker, Electronic Organizers Recorded materials, Hand held Scanners, Print or picture schedule, Electronic Diaries etc.	For Students having problem in language development, reading and writing (Dyslexia), hand-eye co-ordination, written expression and composition (Dysgraphia), difficulty in fine motor skills, Coordination (Dyspraxia), Math (Dyscalculia), and ADHD.

The success and applicability of an assistive technology device is measured by its actual usage, ease in accessibility by its users and in their satisfaction in interaction with their environment. It is essential to ensure that the assistive devices are need-based, inexpensive to produce, purchase and maintain, easy to use, and effective, which can be ensured by the direct involvement of the potential users at each stage of designing and development.

1. Suitability to Users and their Environment - The devices should be compatible with the users' aspirations, emotional needs, and ways of life, and with their culture and local customs; unobtrusive by local standards, and physically comfortable from users' perspectives. It should assure user safety, be useful in a variety of situations (Warger, 1998), and be durable, dependable and reliable especially in rural areas, remote areas and rugged conditions, and compatible with the ground surface and other conditions of a user's physical environment.
2. Inexpensive and Easy to Purchase - The devices should be low in purchase price. Government and/or NGO's can also support in the provision and purchase of the devices, free of charge or at subsidized rates. The devices should be easy and affordable to assemble or produce and maintain, so that keeping the devices in working order would require minimal resources and can be repaired with the use of locally available materials and technical skills.

Easy-to-Use

The devices should be easily understandable by users with limited exposure to technology, portable (easy to move from one place to another), and easy to operate without prolonged training or complex skills. Depending upon the differential abilities of the learners, and the context and feasibility of the approach, assistive provisions in education can help assist students with disabilities in learning, and a collaborative effort in the use of assistive devices, assistive technology, resource room support and innovative educational strategies to promote and sustain inclusion can support these students to learn at par with their non disabled peers in inclusive educational settings (Ahmad, 2014).

Disability is seen to have more serious consequences for those students, who struggle with a 'dually- disadvantaged' life amidst additional handicapping conditions besides 'disability', like poverty, thereby having limited access to rehabilitation services and assistive devices. Trapped in a vicious cycle of exclusion from education, society and mainstream development programmes, without appropriate information, assistive devices and support services, such students lack the means for equal participation in education and development (Norwich, 2008). The resulting lack of skills is a barrier to meaningful employment opportunities later in life, further perpetuating the cumulative disadvantages. Assistive technology can help in meeting these 'disabling' needs by addressing the 'functional barriers' confronted by individuals with disabilities, including the sensory, cognitive, learning and physical disabilities.

Assistive Technology for Students with Mobility Impairments

Students having difficulty with fine motor skills may require larger keyboard while using a computer, an on-screen keyboard or speech recognition programs to coordinate with their learning tasks. The use of a standard keyboard in a computer with access to a 'mouth- or head-stick', where the keys can be pressed with the pointing device can help students with mobility impairments; while Track balls, head trackers and touch screens can serve as suitable alternatives to the computer mouse. Software utilities can create 'sticky keys' that electronically latch the SHIFT, CONTROL, and other keys to allow sequential keystrokes to input commands that normally require two or more keys to be pressed simultaneously.

Students with mobility impairments, using a wheel chair, may have their computer desks adjusted to a comfortable height, to pull up to the computer to work. Keyboard guards can be used by individuals with limited fine motor control, and repositioning the keyboard and monitor may help in enhancing accessibility; like mounting keyboards perpendicular to tables or wheelchair trays at head-height to assist individuals with

limited mobility using pointing devices to press keys, and use of disk guides for inserting and removing diskettes. Left-handed and right-handed keyboards available for individuals who need to operate the computer with one hand, have the provision of more efficient key arrangements, than standard keyboards designed for two-handed users.

Forusers with severe mobility impairments, keyboard emulation ,including scanning and Morse code input, can be used with special switches that make use of at least one muscle over which the individual has voluntary control like - head, finger, knee, or mouth. In scanning input, lights or cursors scan letters, and symbols are displayed on computer screens or external devices, where hundreds of switches tailor input devices to individual needs. Speech recognition systems allow users to control computers by speaking words and letters, where a particular system is 'trained' to recognize specific voices. Abbreviation expansion and word prediction software can also help in reducing input demands for commonly used text and keyboard commands; and on-screen help may assist in efficient access to user guides for individuals who are unable to turn pages in books. Architectural or physical environmental barriers like the absence of ramps, elevators, automatic doors, Braille signage, and telecommunication devices, are also seen to deter and restrict the participation of students with disabilities. Therefore, infrastructural changes and adjustments in the schools and educational institutions (Campbell, 1989), like the availability of ramps; accessibility to classroom, workspace and labs through lifts; washrooms having counters and sinks with adjustable heights etc can be ensured through applicability of universal design for ease in accessibility, and can help address the hidden barriers preventing the equal access and participation of students with mobility impairments in education and social life.

Assistive Technology for Students with Visual Impairment/Blindness

Visually impaired students have difficulty accessing visual material in printed form or on the computer screen, where standard keyboards can aid in accessing Braille input devices, with Braille key labels assisting with the keyboard use. The OBR (Optical Braille Recognition) software can enable users having visual impairment to read Braille documents on a standard A4 scanner, scan the Braille document, analyze the dot pattern, translate the text, and present it on the computer screen. Refreshable Braille displays allow line-by-line translation of screen text into Braille, which can help in detailed editing. The Braille printers provide the 'hard copy' output for the visually impaired users. Scanners with optical character recognition can read printed material; which can then be stored electronically on computers, and be read using speech synthesis, or printed using Braille translation software and Braille printers. Such systems provide independent access to journals, syllabi, and homework assignments for the visually impaired students. Speech output systems can be used to read screen text, while the screen readers or the text-to-speech software like JAWS (Job Access with Speech) can help the user in adjusting the volume, pitch and speed of reading, and in choosing or adjusting to a male or female voice according to their preference. Screen readers including navigation tools allow users to skip from headline to headline, or category to category while reading. Using the synthetic speech, the computer can read text passages, analyze the phonetic structure of words and attempt re-constructing words by putting together a string of synthetic phonemes, ensuring easy understandability of the message by the student. The use of earphones for individuals using speech output systems can reduce and limit the distractions for other individuals present.

Audio materials like talking books and audio cassettes of recorded lessons can be used by students with visual impairment. The use of sophisticated audio devices, CD players, cassette players, and recording machines can be used to record lectures, books and other study materials and help students in submitting their assignments in audio formats. The descriptive video service with a narrative verbal description of the visual elements displayed on the screen enables the students to automatically hear the descriptions of all the visual elements, providing the students with visual impairment an opportunity for better socialization and knowledge building (Petty,2012).

Assistive Technology for Students with Low Vision

Students with low vision may find the standard size of letters on the computer screen or printed documents too small to read, while some may also not be able to distinguish one color from an- other. Use of large print key labels, special equipment for the modification of display or printer output, computer-generated symbols, both text and graphics enlarged on the monitor or printer, can prove useful to students with low vision, especially in using standard word processing, electronic mail, spreadsheet, and other software applications. Adjusting the color of the monitor or changing the foreground and background colors, through special software like reversing the screen from black on white to white on black for individuals who are light sensitive, can help improve access and readability. Anti-glare screens can make screens easier to read, while voice output systems can also be used by people with low vision. The printed material can be read by scanners with optical character recognition and stored electronically on computers, where it can be read using speech synthesis or printed in large print. Assistive devices that are suitable for students with low vision may be used to aid in efficient learning like close circuit television, magnifying glasses and hand magnifiers, Braille language, talking calculators and tape recordings (Burgstahler, 1992).

Assistive Technology for Students with Hearing and/or Speech Impairments

Word processing and educational software may help hearing impaired students in developing writing skills. Alternatives to audio output can assist the hearing-impaired computer user, in place of using a standard keyboard and mouse. Advanced speech synthesizers may act as substitute voices, providing a compensatory tool for students who cannot communicate verbally. Students with portable systems can participate in class discussions once adapted computers provide them with intelligible speaking voices. Students with hearing and/or speech impairments can use standard written or on-screen documentation without difficulty, with the development of adequate speech and language patterns using supportive aids like recorded tapes, speech trainers, photo albums, articulation charts, concrete objects and other visual cues, for language learning, speech training, and speech correction. While 'text-telephones' can help in allowing phone conversations to be typed and read rather than be spoken and heard, the 'computerized speech recognition' software allows the computer to change a spoken message into a readable text

document that can be easily read by the hearing impaired students.

Assistive Technology for Students with Specific Learning Disabilities

For students having Specific Learning Disabilities, educational software can help in skill building, by offering multi sensory experiences, positive reinforcement, individualized instruction, and repetition. Students having difficulty processing written information can complete writing assignments and tutorial lessons with the aid of computers, like the standard word processor may prove a valuable tool for students with Dysgraphia, an inability to write legibly. Quiet work areas and ear protectors may make computer input easier for students who are hypersensitive to background noise and get easily distracted. Adaptive devices like large print displays, alternative colors on the computer screen, and voice output can help in compensating reading problems. 'Electronic Math Sheets' help in the organization, alignment and working of the Math problems on a computer screen, where the numbers appearing can be read aloud through the speech synthesizer, helping students facing difficulty in aligning Math problems using pencil and a paper. Software like 'Abbreviation expanders' can prove helpful with word processing to create, store, and re-use abbreviations for frequently used words or phrases, to ensure proper spellings for students who have difficulty in writing. The Paper-based Pen technology (Liao et al., n.d.), can record and link audio to what the student writes using the pen and the special paper, enabling note-taking while recording the teacher's lecture simultaneously, which the student can also listen to later by touching the pen to the corresponding handwriting or diagrams. This technology proves useful for students struggling with listening, writing, memory and reading skills. Students having difficulty interpreting visual material can improve comprehension and the ability to identify and correct errors when words are spoken or printed in large fonts. Computer documentation in electronic forms may be used with enlarged character and voice synthesis devices to ensure better accessibility to those with reading difficulties.

Assistive technology has a major role in remediating and compensating the performance deficits experienced by students, enhancing the students' performance; and ensuring effective evaluation as an accommodation during testing, offering adequate solutions when an extended evaluation is needed. Effective technology integration in education can therefore help in addressing the functional barriers experienced by students with disabilities, providing them with equitable learning opportunities and a leveled field to rightly exhibit their differential abilities, through provision of necessary support and an equally accessible learning environment to all.

Overcoming Barriers to Access and Success

With the emergence of the social model of disability, it is increasingly being argued that the greatest barriers to the inclusion of children with disabilities results from inaccessible environments (Gal et al., 2010). Besides, the attitude of teachers, and students, and their level of access and success with the technology use, the level of expertise and training of the teachers regarding the technology use and application; student perception, training and acceptance; and the curriculum adaptation and technology integration in the inclusive classrooms are some of the major challenges and decisive factors in the efficient use of assistive technology in inclusive education (Lang, 2001, Petty, 2012; Reed and Bowser, 2005).

Training Students and Acknowledging Expectations /Attitudes

Students need to be supported in learning to use the technology to be able to successfully access it; otherwise the results may prove to be even worse than having no access to the technology at all. The western literature on the use of assistive technology (Katz and Mirenda, 2002; Reed and Bowser, 2005; Scherer, 2004; Stainback and Stainback, 1984) highlights the level of training for the students with disabilities being taken up by colleges and universities through courses in various software programs, provision of technology training in computer labs, or through explicit assistive technology training through a support service office or assistive technology lab. It is therefore, up to the institution, to plan the setting in the implementation of the training, support and guidance as required. The perception and attitude of the students with disabilities regarding the assistive technology is one of the deciding factors in its selection and sustainable usage. And if the process is perceived by them to be too cumbersome and time-consuming, there are chances of considerable resistance from the students (Lyon et al., 2001), which with regular training should be positively modified to aid in efficient learning. An effective orientation to the functioning of the assistive technology; balanced exchange of opinions; discussion of the benefits, expectations and limitations, goals, and inhibitions about using the technology or the specific software should be planned, resolved and executed for a better inclination and motivation for the students. A system for referrals to local agencies or experts, besides the consulting support at schools and colleges, as well as considerable support from parents and educators should be ensured. Sufficient practice with apt applications to relevant tasks like assignments for classes should be planned, besides the necessary evaluation of the students, their environment and the available tools, to determine the appropriate assistive technology to use in any specific setting for the successful incorporation of technology. As far as possible, similar applications and adaptations of technology should be considered for students at both their school-setting as well as their home, taking the parents of students with disabilities as well as the students themselves as equal partners in the decision- making and implementation process.

Conclusion

With the rapidity that technology changes, it is difficult for researchers to keep up with new technology that could assist students in the areas of reading, spelling, writing and speech. For example, there are likely to be new developments using Web 2.0 technology, but no studies were found using this latest technology.

Continued research in the area of ATs is essential with the explosion of new technologies. The research should focus on specific research questions and be more systematic in trying to answer these questions, ensuring that the research uses an empirical design with enough participants that can enable it to produce valid and reliable results or qualitative studies which are theoretically sound and have rigor and authenticity. Considering the high level of investment that educational

authorities around the world are making in ATs, the small number of studies that had adequate research design features was quite surprising.

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Assistive Technology in Classroom

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Abstract:

When we think of the word "technology," these devices are likely the first thing to come to mind. The benefits of computers and tablets are extensive. They are customizable to accommodate the unique needs of each special education student. Few importantly, digital devices and software accommodate collaborative learning and instantaneous communication. Files can easily be shared between students during group projects, or students can navigate a virtual lesson alongside their peers. Through videotaped social interactions, students with disability can learn important life skills and social behavior without accidentally offending someone. In addition to interpersonal skills, these videos can work for self-help, linguistic, academic and emotional problems as well. Classroom is place where students with disability can learn maximum with in his/her potential.

Key Words: Assistive Technology, Special Education, disability.

Introduction

Assistive Technology (AT) refers to any device or system that helps to improve the functional capacity of people with disabilities, this section deals primarily with computer-related applications.

Assistive technology is a very broad field and may range from the very simple to the very complex. It may be divided into high, medium and low-tech categories:

- 'low-tech' refers to unsophisticated and largely non-electronic devices, such as a laptop stand
- 'medium-tech' devices are more complicated but are used by those by pupils with some degree of independent functioning. Adaptive computer peripherals, such as alternative mice or keyboards, will usually come within this category
- high-tech' devices include sophisticated communication and computer control systems. At this end of the AT range, considerable specialist training and support will be necessary, and pupils with little independent functioning or communication ability will be the main users.

Simply put, assistive technology is a device or tool that helps someone with a disability function better. Assistive technology improves function in children with both learning and physical disabilities. And, despite the name, these devices are not always hi-tech. Assistive technology has been in the classroom for decades, and sometimes even the simplest things can make a huge difference.

The Role of Assistive Technology in Special Education

The Individuals with Disabilities Education Act (IDEA) stipulates that schools must provide children with disabilities the appropriate services and accommodations. After evaluations by health professionals and educators, an Individualized Education Plan (IEP) will be drawn up where educators, parents, and health professionals will outline the child's unique needs and the appropriate response. Assistive technology often falls into this category of services accommodations.

What are the Different Types of Assistive Technology?

Tablets, Computers, and Software

When we think of the word "technology," these devices are likely the first thing to come to mind. The benefits of computers and tablets are extensive. They are customizable to accommodate the unique needs of each special education student. Adjustable settings help with reading (for example, enlarging text size), play audio and video, record sound and video, have text-to-speech software, can come with touch-screen options, and even have gesture recognition technology for hands-free commands and typing make tablets and computers as strong assistive technology devices.

A few types of assistive technology software include:

Games: Educational games of all types are an excellent tool for learning. Aside from breaking up the monotony of the traditional lecture-based classroom, games have the added benefit of catering to different learning styles. They also create an interactive world, allowing tactile learners to navigate lessons using touch, sound, and sight.

Word processing software: Writing software has come a long way. The inclusions of word-prediction and grammar-checks are particularly helpful for those students with speech or language disorders.

Text-to-speech (TTS): TTS is a technology that reads digital text out loud. TTS is helpful for students who struggle with reading and those with learning disabilities or speech-language disorders.

Importantly, digital devices and software accommodate collaborative learning and instantaneous communication. Files can easily be shared between students during group

projects, or students can navigate a virtual lesson alongside their peers. Students can turn in their assignments "online" or work through educational software at home. For special education students, these devices are of particular importance because they are customizable to accommodate the unique needs of each student.

Devices for Physical Disabilities and Impairments

While this category may seem less sophisticated, it is sometimes the simplest accommodations that provide the greatest assistance. Children with visual impairments benefit from braille materials, notebooks with raised margins and lines, large-text books, and audio options for books and instructions. Hearing aids and closed captioning help those who are deaf or hard of hearing. For students with motor coordination difficulties, pencil grips and book holders improve writing and reading abilities.

5 Examples of Assistive Technology in the Classroom

Assistive technology is designed to help students who have learning disabilities. Whether students have physical impairments, dyslexia or cognitive problems, assistive technology can help them to function within the classroom. These tools include any type of equipment or device that helps students to compensate for their learning disabilities. While they are unable to eliminate learning problems entirely, they can help students to capitalize on their strengths and minimize their weaknesses. Among the most innovative technologies available today, the following five are the most popular.

1. **Electronic Worksheets**

   Students with learning disabilities like dyslexia can use electronic worksheets to complete their assignments. These worksheets help students to line up words, equations and numbers on their assignments. On some of the worksheets, text-to-speech or speech synthesizing technology is even available.

2. **Phonetic Spelling Software**

   For many children with learning disabilities, reading and writing can be a challenge. Phonetic spelling software is designed to automatically convert the student's typing into the word that they intended to write. For alternative reading options, students can always check out audiobooks. With the audiobook, students can follow along in their text and overcome reading difficulties.

3. **Talking Calculators**

   Students who have dyscalculia can benefit greatly from a talking calculator. The gadget makes it easier to check assignments, read numbers and perform calculations. While the talking calculator is a fairly simple tool, it offers an exceptional benefit for students who would otherwise struggle in math classes. Other than talking calculators, students can also check out text-to-voice devices. They function on the same concept of converting written words into an audible track. Students can use these devices to check their spelling or to improve their reading comprehension skills.

4. **Variable Speed Recorders**

   Everyone has a different learning style, and many students struggle with understanding auditory lectures. For these students, a variable speed recorder is an ideal solution. In essence, the student just has to hit record while they are in class. Afterward, the recording can be slowed down or sped up for the student to listen to it again and again. If the pitch of the recording is hard to understand, students can modify the pitch up or down to make their lectures more accessible.

5. **Videotaped Social Skills**

   Autistic children and other children with learning disabilities may struggle to figure out normal social interactions. In the past, the most common way to learn social interactions was to practice them. Unfortunately, many children inadvertently behaved inappropriately as they tried to learn what defined "normal" social interactions. With videotaped social interactions, students can learn important life skills and social behavior without accidentally offending someone. In addition to interpersonal skills, these videos can work for self-help, linguistic, academic and emotional problems as well.

Learning disabilities can manifest in a variety of different ways. From mild disabilities to debilitating problems, these disabilities affect the student's ability to learn and take part in a classroom. Unfairly stigmatized in popular culture, it is now possible to use technology to overcome many learning disabilities. From offering students ways to slow down the lecture to providing talking calculators, these technological devices are able to meet the student's unique needs. With help, students can become the competent, exceptional individuals that they already have the potential to be.

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- https://www.masters-in-special-education.com › lists › 5-examples-of-assist....Assistive technology is designed to help students who have learning disabilities. ... While the talking calculator is a fairly simple tool, it offers an exceptional benefit for ... these technological devices are able to meet the student's unique needs.
- https://www.readingrockets.org › article › assistive-technology-kids-learning....Universal Design for Learning: Meeting the Needs of All Students ... Assistive technology (AT) is available to help individuals with many types of disabilities ... a school report by dictating it and having it converted to text by special software.
- https://otsimo.com › Blog › Technology….Simply put, assistive technology is a device or tool that helps someone with a disability function better. Assistive technology improves function in children with both learning and physical disabilities. And, despite the name, these devices are not always hi-tech.

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