ISSN 2278-8808 SJIF 2015: 5.403
An International Peer Reviewed & Referred
SCHOLARLY RESEARCH JOURNAL
FOR INTERDISCIPLINARY STUDIES

ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) TO BUILD INCLUSIVE CLASSROOM FOR COGNITIVE DISABLED CHILDREN–AN APPROACH TOWARDS EDUCATIONAL PARADIGM SHIFTS

Samaresh Adak

Satyapriya Roy College of Education

Abstract

This paper presents and evaluates the development of an educational technology curriculum aimed at pre-service, primary education and undergraduates; the focus is on the incorporation of ICT competences to build inclusive education for cognitive disabled children. Inclusion or integration is an important part of equal opportunity in education. Demands for inclusive education have increased and fostered major changes to schooling and education. Students with cognitive disabilities are educated alongside their peers within the local community therefore mainstream schools are required to adapt to accommodate a diverse group of students with a variety of needs. Students were able to monitor the development and implementation of tools for cognitive disabled children in schools, and plan teaching and learning in within their course project work by using technology. Within an educational technology curriculum, a competence framework was developed for fostering the use of ICT in the teaching of, and learning by, cognitive disabled children. This was achieved against the backcloth of the baseline learning objectives of autonomy, inquiry, creativity and innovation. In pre-service teacher education in educational technology, the focus is on inquiry based learning, and on planning and incorporating the innovative use of ICT into teaching; the emphasis is also on enhancing the student teachers' competences for his/her own professional development. Paradigm shift is a fundamental change in the basic concepts and experimental practices of a scientific discipline. Here the Paradigm shift occurs in the concept development of e-learning environment by using several technologies for cognitive disabled children. E-learning environment in the inclusive classroom assists classroom management and facilitates the individual and collaborative engagement and activities in the process of development of cognitive abilities and also to overcome cognitive disabilities by using cognitive therapies for better learning, experiences and interests of every individual student.

Keywords: *Educational technology curriculum, inclusive education, cognitive disabled children, Paradigm shift, e-learning environment for cognitive disabled children.*

Introduction:

Information and communication technologies (ICT) have become common place entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavor within business and governance. Inclusion or integration is an important part of equal opportunity in education. Demands for inclusive education have increased and fostered major changes to schooling and education. Students with disabilities are educated alongside their peers within the local community therefore mainstream schools are required to adapt to accommodate a diverse group of students with a variety of needs. Approaches to the inclusion of children and young people into mainstream classrooms, and the identification and recognition of special educational needs, is an integral part of daily school work.

Information and communication technologies:

ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries.

Inclusive classroom: Inclusive education is a general education classroom in which students with and without disabilities learn together. It is essentially the opposite of a special education classroom, where students with disabilities learn with only other students with disabilities.

Types of Cognitive Disabilities:

Dyslexia

Dyslexia is the most common form of language-based learning disability. Approximately fifteen to twenty percent of the population has some form of language-based learning disability. Dyslexia is primarily a reading disability, and there is evidence suggesting that Dyslexia is a condition that is inherited. Dyslexia is a condition that is found in both females and males from all ethnic backgrounds. Dyslexia involves difficulty in single world decoding, often reflecting an insufficient phonological processing ability. This lack of ability is something that is many times unexpected in relation to the person's age and other cognitive and academic abilities. The person has not experienced another form of developmental disability, or sensory impairment. The person may have trouble with different forms of language, reading, and difficulty with spelling and writing as well.

Attention Deficit Hyperactivity Disorder (ADHD):

ADHD is a medical condition affecting a person's ability to focus, sit still, and pay attention. They may have difficulty in focusing on tasks or subjects, or act impulsively; they may also get into trouble. ADHD begins in childhood, but may not be diagnosed until the person reaches adolescence or even adulthood. Persons with ADHD may have difficulty with finishing assignments from school or tasks from home, jumping from one activity to another. They may lose things; forget things like homework or something they were supposed to do. They may have difficulty with following instructions, or following through with tasks they have been assigned. The person may make careless mistakes, or have difficulty paying attention to details. Persons with ADHD may have trouble organizing activities, or tasks, and may interrupt other people. They may fidget, feel restless, or talk excessively.

Brain Injury:

There are a number of causes of brain injury, including Stroke, illness, Traumatic Brain Injury (TBI), brain tumors, and Meningitis, among others. Each brain injury is unique - there is no reliable way to predict how an individual's brain will be affected by a particular injury. Once a person's brain has been injured, health care providers perform a number of different psychological and neurological tests in order to determine the areas of the brain that have been damaged. With some brain injuries the damages done and the result in behaviors are barely noticeable. In other brain injuries the damages and affects are more extensive. The extent of the injury to the person's brain determines the outcome of the person's ability to process information.

Genetic Disability

Genetic Disabilities such as Down syndrome, Autism, and Dementia, affect people individually. Some persons with these disabilities are able to function at higher levels than others. Persons with Down's syndrome, for example, may function at a high enough level to live independently, while others with the syndrome need consistent assistance with activities of daily living. The greater the severity of the cognitive disability the person experiences, the more difficult it is for the individual to comprehend.

Intellectual functioning: Refers to a person's ability to plan, comprehend, and reason. A child's intellectual functioning can be assessed by an intelligence test. The most common intelligence test that you've probably heard of is the IQ test. Generally, a child with scores of 70 to 75 or lower is classified as having a cognitive disability. Refers to an individual's ability to apply social and practical skills in everyday life. Examples of adaptive behavior can

include personal care, social problem-solving skills, dressing and eating skills, using money, and following rules.

There are three types of cognitive disabilities according to intelligence. These are mild cognitive disabilities, moderate cognitive disabilities and severe cognitive disabilities .Accounting for around 85% of all fall in the mild cognitive disabilities. Kids in this category have IQ scores between 55 and 70 and are usually included in the regular classroom. Students with this type of Moderate cognitive disability have IQ scores between 30 and 55. Kids with severe cognitive disabilities have IQ scores that fall under 30 and will have few communication skills, and will need direct supervision. Of all cognitive disabilities, only about 3 to 4% of children have a severe cognitive disability.

Clinical Diagnosis of Cognitive Disability

Clinical diagnosis of cognitive disability can include **Down syndrome**, Traumatic Brain Injury (TBI), Autism, or **Dementia**. Clinical diagnosis may also include less severe cognitive conditions such as **Dyslexia**, Attention Deficit Disorder, Dyscalculia, and other learning disabilities. Dementia is a serious loss of cognitive ability in a previously unimpaired person, beyond what might be expected from normal aging. Both dementia and intellectual disability are defined by neurologists as having an IQ that is two standard deviations below median (below about 70, when 100 is the median); the difference between these two classifications for intellectual disability is whether the low IQ represents a lifelong condition (intellectual disability), or a condition that is acquired later (dementia)

Functional Diagnosis of Cognitive Disability

Sometimes it is more useful to avoid the medical perspective of cognitive disability and view them from a functional perspective instead. A Functional disability perspective ignores the medical and behavioral causes of cognitive disability and focuses on the abilities and challenges the person with a cognitive disability faces. Functional cognitive disabilities may involve difficulties or deficits involving problem-solving, attention, memory, math comprehension, visual comprehension, reading, linguistic, and verbal comprehension. Intellectual disabilities, also known as developmental delay or mental retardation, are a group of disorders defined by diminished cognitive and adaptive development. Affecting more males than females, they are diagnosed in between one and three percent of the population. Many cognitive disabilities have a base in physiological or biological processes within the individual, such as a genetic disorder or a traumatic brain injury. Other cognitive disabilities may be based in the chemistry or structure of the person's brain. Persons with more profound cognitive disabilities often need assistance with aspects of daily living. Persons with minor

learning disabilities might be able to function adequately despite their disability, maybe to the point where their disability is never diagnosed or noticed.

Use of ICT to promoting educational opportunities for cognitive disabled learners:

ICT should be considered as a key tool for promoting equity in educational opportunities;1. Access to appropriate ICTs should be considered an entitlement; 2. Training of educational staff in the use of general and specialist ICT must be considered a priority area; 3. The promotion of ICT research and development requires a multi stakeholder approach; 4. Data collection and monitoring in the use of ICT in inclusion should be considered an area requiring attention at all levels of educational provision. 5. Promoting equity in educational opportunities. 6. Training of educational staff in general and specialist ICT. 7. Monitoring the use of ICT for inclusion of cognitive disabled learners.

Assistive Technologies:

Many people, children, young people and adults, particularly those with special educational needs, there is a need for additional technology so that they are better able to use mainstream technologies, in order to access learning and other activities. Although, as is discussed below, increasingly mainstream ICT come with features that make it easier for people with special needs to use them, there is often the need for additional technology to provide access. Assistive Technology is any item, equipment, hardware, software, product or service which maintains, increases or improves the functional capabilities of individuals of any age, especially those with disabilities, and enables them more easily to communicate, learn, enjoy and live better, more independent lives" (BATA, 2011). In inclusive education all aspects of the use of these technologies are important but as many commentators have observed it is how they are applied that is important. Assistive technology is defined (Winter and O'Raw, 2010) as any item, piece of equipment or product system that is used to improve the functioning of individuals with cognitive disabilities and is cited as providing students with the following key inclusive benefits:

1. Greater control over their own learning experience. 2. Can participate in and contribute more fully in classroom activities and complete assignments independently. 3. Can interact to a greater extent with their typical peers, improving social skills and enhancing acceptance.

Innovative use of Assistive Technologies for the cognitive disabled learners:

Abbott and colleagues (Abbott et al 2011) in their recent review of the literature of AT highlight that innovation takes place in all stages of technology development and that there is software and hardware that supports the learning of young people, particularly those with special educational needs or disabilities in the areas proposed in Abbott's earlier research.

Software that helps to train or practice (commonly called 'drill and practice' software), is still important for supporting over learning and repetition of basic concepts in a more imaginative way than pen and paper. Software designed to assist learning is primarily but not solely 'technology for access.' This type of software is important, particularly for those with sensory or cognitive disabilities. The technologies which Abbott et al consider most enabling are those which support communication for cannot do so without the use of technology, and can 'enable learning'. Other definitions help to make it clearer what enabling or assistive ICT's can do in terms of providing equality of educational opportunity. ICT can help young people to learn at the speed that suits their needs, can help to minimize the boundaries between subjects, and also improves creativity. It can be used as a tool in many areas, as a means for: teaching, studying, communication and aiding therapy and diagnosis of need (Molnár et al, 2008). Winter and O'Raw (2010) identify the following features of ICT that support learners with SEN in accessing the curriculum and to support inclusive practice: Individual attention: in areas such as reinforcement of understanding it can provide structure and variety as well as information rich multimedia content to support subjects such as geography and history (citing Shaw and Lewis 2005). Research indicates significantly improved accuracy of responses and on:1. Task behavior when computers are used by learners with attention deficit disorders (ADD). 2. Spell checker: as a support for young people with dyslexia but also inclusive tool to encourage the production of writing. 3. Text-To- speech: supporting a wide range of text disabled young people both through computer based systems and low tech devices such as digital dictation devices. 4. Training specific skills: often literacy and numeracy focused and may have assessment of progress/understanding built into the software which modifies the pace and complexity of tasks presented to the student. This type of software can also to provide feedback to the teacher on students time on tasks etc. 5. Planning tools: visual organizing or mapping tools to support the structuring of information, for example when planning an essay. Assistive listening devices include FM, infrared, and loop assistive listening devices. This type of technology allows people with hearing difficulties to focus on a speaker or subject by getting rid of extra background noises and distractions, making places like auditoriums, classrooms, and meetings much easier to participate in. The assistive listening device usually uses a microphone to capture an audio source near to its origin and broadcast it wirelessly over an FM (Frequency Modulation) transmission, IR (Infra Red) transmission, IL (Induction Loop) transmission, or other transmission method. The person who is listening may use an

FM/IR/IL Receiver to tune into the signal and listen at his/her preferred volume and they will be able to improvised themselves under the supervision of the teacher educator.

Use of Graphic Organizers as a tool for cognitive disabled learners: According to Professor of Education Charles Hughes, graphic organizers—visual and spatial displays that make relationships between related facts and concepts more apparent—often are recommended as an instructional device to assist students with learning disabilities in understanding the increasingly abstract concepts that are presented in upper-elementary, intermediate, and secondary grades.

"Graphic organizers are intended to promote more meaningful learning and facilitate understanding and retention of new material by making abstract concepts more concrete and by connecting new information with prior knowledge," he said.

For example, he added, cognitive mapping—a type of graphic organizer—assists in making major ideas and relationships explicit by using lines, arrows, and spatial arrangements to describe text content, structure, and key conceptual relationships, and semantic mapping—another type of graphic organizer—enables students to recognize relevant information from lectures and texts, delete isolated details that may not be relevant to overall understanding, and highlight key concepts that may have not been fully developed in a lecture or text.

Hughes and colleague, Assistant Professor of Education Douglas Dexter, identified and evaluated sixteen studies in which graphic organizers were used with upper-elementary, intermediate, and secondary students with learning disabilities. The team's goal was to determine whether a pattern exists regarding the influence of graphic organizers on student learning as measured by posttest results. The analysis is published in a recent issue of the journal *Learning Disability Quarterly*. "All of the studies we evaluated showed a large, positive effect of graphic organizers on posttest performance of students with learning disabilities," said Dexter. "The studies also showed a medium effect of graphic organizers on posttest results one to four weeks after conclusion of the intervention, suggesting that the use of graphic organizers can help students retain their learning for a period of time, especially if they are structured in a simple way that facilitates understanding and perception of concept relationships and if the duration and length of intervention sessions are long enough to positively affect maintenance."

Conclusion:

The above guidelines summarize a set of recommendations that schools can adopt to implement inclusive education programmes for children with cognitive disabilities within their regular set ups. The recommendations have been presented in a generalized mode to

permit schools to interpret, modify and adapt the guidelines based on their individual needs and characteristics.

The review identified a relatively small number of research papers that focused on the use and impact of ICT for inclusion of cognitive disabled learners in the context of education. There is however considerable research on some aspects of inclusion, for example e-inclusion, and also the need for accessible information and resources. A few reports looked beyond the use of ICT and how it can provide physical access, to learning through assistive technology, use of Graphic Organizers and also examined the ways in which scaffolding can be provided, both in terms of over-learning and practice software, and in assisting learning through communication and interaction. There is a significant volume of research and reports that focus on the education of learners with special educational needs and disabilities, and approaches to inclusive education of cognitive disabilities much enriched with the use of ICT in education; with some that bridge both areas of research. For example research by Abbott et al (2011) summarizes some of the more recent findings in the use of technology for enabling learning, focusing on the new forms of access and control, such as eye-gaze and neural control, and games based immersive experience for people with autism. However the review also highlighted the dearth of in-depth research into this area, of longitudinal or pedagogically informed classroom practice. The review has so far highlighted that: 1. knowledge and awareness of products, in an area of rapid development in technology is a challenge for educators and others who work with young people and those providing on-going professional development. The absence of a common language across disciplines and countries is also a complicating factor; 2. There is a need to incorporate a practical understanding of the ways in which both assistive and enabling technologies can be mainstreamed and form a core element of inclusive teaching practice; 3. some researcher have highlighted the value of understanding basic access features and configurations built into operating systems, and other utilities in commonly used software, such as predictive spellcheckers in word processors; 4. Official statistics indicate that, although in many of the EC countries the ratio of computers to pupils is high, there are indications that where this is not the case there are still significant barriers to ICT becoming integrated into practice, inclusive or otherwise; 5. There is little research into the impact of mainstream commercial mobile devices, such as touch screen tablets, within an education context, although there are indications that schools are investing in these, both in mainstream and special school settings; 6.although research has repeatedly highlighted the social, economic and learning benefits of internet enabled computer access in the home there is still a digital divide with some young

people (at best) having shared or public access. From the above study we can conclude that there are so many ICT technologies (Assistive Technology, Graphic Organizers and others devices) that we can use to built an inclusive classroom for cognitive disabled learners. So we are going to forward developmental way and try to make change the concept from special education needs to inclusive education classroom formation by using the cognitive disabled learners. This is the paradigm shift in the educational system where an revolutionary change is going on steadily on the time to time and also we are able to form an inclusive world that is our final goal and ultimate we will achieve it definitely.

References:

Al-Ansari, H. (2006). Internet use by the faculty members of Kuwait University. The Electronic Library 24 (6), 791-803.

Alexander, J.O. (1999). Collaborative design, constructivist learning, information technology immersion, & electronic communities: a case study, Interpersonal Computing and Technology: An Electronic Journal for the 21st Century, 7, 1–2.

Amutabi, M. N. & Oketch, M. O. (2003), 'Experimenting in distance education: the African Virtual University (AVU) and the paradox of the World Bank in Kenya', International Journal of Educational Development ,23 (1), 57-73.

Attwell, P; Battle, J. (1999). "Home Computers and School Performance". The Information Society. No. (15), Pp. 1-10. Barron, A. (1998). Designing Web-based training. British Journal of Educational Technology, 29, (4), 355-371.

Becker, H. J. (2000). "Pedagogical Motivations for Student Computer Use that Leads to Student Engagement". Education Technology, 40, (5), 5-17.

Berge, Z. (1998). Guiding principles in Web-based instructional design. Education Media International, 35 (2), 72-76.

Bhattacharya, I.& Sharma, K.(2007) , 'India in the knowledge economy – an electronic paradigm', International Journal of Educational Management , 21(6) , 543-568.

Bottino, R.M. (2003),'ICT, national policies, and impact on schools and teachers' development' 'CRPIT '03: Proceedings of the 3.1 and 3.3 working groups conference on International federation for information processing', Australian Computer Society, Inc., Darlinghurst, Australia, Australia, 3-6.

D. Nix & R. Spiro (Eds.), Cognition, education, multimedia Exploring ideas in high technology 115–141. Hillsdale, NJ: Lawrence Erlbaum Associates.