ROLE OF ICT IN TEACHER EDUCATION AND SPECIAL EDUCATION

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Abstract

ICT is of particular value in developing the language experiences of learners with HI. ICT can be a good visual medium, with pictures, signs or texts on screen allowing pupils to extend both their general knowledge and use of language without being dependent on the spoken words. Learners who have a HI often need opportunities to extend their use of descriptive language in order to describe, compare and contrast objects: all skills that underlie effective information handling. Collaborating on an ICT activity can encourage a group of students to extend their use of language and their understanding of concepts as they plan and carry out their work.

Introduction:

"Technology can become the ―wings‖ that will allow the educational world to fly farther and faster than ever before—if we will allow it." - **Jenny Arledge**

The world today is characterized with the emergence of knowledge based society wherein ICT plays a pivotal role. The National curriculum framework 2005 (NCF 2005) has also highlighted the importance of ICT in school education. With this backdrop, major paradigm shift is imperative in education characterized by imparting instructions, collaborative learning, and multidisciplinary problem-solving and promoting critical thinking skills.

Government of India has announced 2010-2020 as the decade of innovation. Reasoning and Critical thinking skills are necessary for innovation. Foundation of these skills is laid at school level. It is desirable that affordable ICT tools and techniques should be integrated into classroom instructions right form primary stage so as to enable students develop their requisite skills. Most of the tools, techniques and tutorials are available in Open domain and accessible on web.

Information and Communication Technologies (ICT) that are becoming increasingly pervasive in societies around the world are also reaching schools. With numerous global advancements in ICT it is essential that educators have a thorough working knowledge of these media and their influence on the performance and engagement of their students. There is no firm agreement on the definition of ICT, as these technologies evolve almost daily. Here we assume that ICT includes, but is not limited to, personal computers, laptops, printers, LCD projectors, palm devices, iPods, fax machines, cell phones, Internet, and Intranet. Also

we employ what the National (US) Higher Education ICT Initiative (2003) describes as the ICT proficiency in the higher education context:

ICT can be described as the ability to use digital technology, communication tools, and/or networks appropriately to solve information problems in order to function in an information society. This includes the ability to use technology as a tool to research, organize, evaluate, and communicate information and the possession of a fundamental understanding of the ethical/legal issues surrounding the access and use of information.

This definition encompasses three areas of ICT literacy, namely cognitive, technical, and social. It recognizes that in the technologically connected world, one does not live in isolation and therefore needs ‗soft‘ as well as ‗hard‘ skills to confidently, reliably, and responsibly use ICT.

Role of ICT in teacher education programs:

It seems that effective development of pre-service teachers‘ ICT proficiency is not a straightforward process, but is the one that asks for a careful, multi-layered approach.

 First, a needs assessment is important to find out what ICT skills and knowledge teachers need at schools.

 Second, designers of teacher education programs should know the pre-service teachers‘ perceptions of ICT and their attitudes toward ICT integration into curriculum (Murphy, 2000). This is because these attitudes and perceptions are instrumental in how future teachers will use ICT in their teaching (Sasseville, 2004). Although there is a great deal of research on technology and teacher education, because of specifics of various teacher education programs, changes in population trends, and rapid technology advancements, there is a constant need for more research about the role of ICT in teacher education programs in this specific context.

 Third, teacher education programs need to take into account the two typical arguments in favour of the ICT appropriation in schools. One argument emphasises the importance of technological skills. Supporters of this argument urge teacher education programs to provide future teachers with as many technological skills as possible. The other argument accords a more important role to developing pre-service teachers‘ perspectives of and pedagogical knowledge about technology integration. Proponents of the latter argument believe that content-related technology knowledge is the most important factor for technology integration in teaching. This knowledge is referred to as technology pedagogical content knowledge (TPCK) (Mishra & Koehler, 2006). The institutions that uphold the teacher education programs need to be aware of these two competing arguments and use the opportunity to build a balanced ICT program for pre-service teachers.

New requirements:

Today's teachers are required to be:

 Facilitators, helping learners to make judgments about the quality and validity of new sources and knowledge.

 Open-minded, analytical and professionals.

 Active cooperators and collaborators.

 Mediators between learners, what they need to know and where that knowledge can be found.

 Providers to reinforce understanding.

New Competencies:

For teachers to be able to integrate the use of ICTs into their lessons, a Variety of skills need to be developed:

☐ Creativity

☐ Flexibility

☐ Logistic Skills: assigning work, grouping students and devising new locations for learning to take place.

☐ Skills for project work.

☐ Administrative and organizational skills.

☐ Collaborative skills.**New ICT skills**

A technically competent teacher is able to:

☐ Operate computers and use basic software for word processing, spreadsheets, email, etc.

☐ Evaluate and use computers and related ICT tools for instruction

☐ Apply current instructional principles, research, and appropriate assessment practices to the use of ICTs

☐ Evaluate educational software

☐ Create effective computer-based presentations

☐ Search the Internet for resources

☐ Integrate ICT tools into student activities across the curriculum

☐ Create multimedia content to support instruction

☐ Create hypertext documents to support instruction

☐ Demonstrate knowledge of ethics and equity issues related to technology

☐ Keep up-to-date as far as educational technology is concerned

Training requirements

In assuming their new roles, teachers are expected to upgrade their knowledge and acquire new skills in these areas:

☐ **Pedagogy** - Teachers need new pedagogical skills so they can take full advantage of the potential of technology to enhance the learning process. The use of questioning strategies is an essential component of developing an inquiry-based classroom where a structured discussion raises basic issues, probes beneath the surface of things, and pursues problematic areas of thought.

☐ **Curriculum development** - Teachers must be able to develop appropriate, effective curricula that enable students to construct meaning, integrate new knowledge into their world views, and communicate understanding.

☐ **Full integration into curriculum** – Strategies are necessary to meaningfully integrate technology into the curriculum. Technology must be considered as a learning tool, not merely treated as a subject area in itself. In particular, teachers need the skills to develop long-term strategies for using technology to support their curricula, student outcomes, and learning goals.

☐ **Staff development** - Activities that simply provide skills in using particular software applications, for instance, have shown little impact on students' classroom learning. Ultimately, students' success depends on teachers using technology to support sophisticated, hands-on/minds-on, multidisciplinary learning projects. These projects must be tightly linked to overall strategic goals and to content standards.

◻ **Support system** - Teachers must have systems of support at various levels - regional, district, and school - for integrating technology and overcoming isolation as they grapple with new and unfamiliar approaches to teaching and tools for learning. They also need real-time technical support in resolving problems related to hardware, software, and networks; problems that can often interfere with or completely derail the learning of both teachers and students.

How can ICT support the learning of children with special educational needs?

ICT can support the learning of children with Special Educational Needs [SEN]. It enables children with SEN to overcome barriers to learning by providing alternative or additional methods of communicating within the **learning process**. Moreover, it also helps teachers to create a supportive framework, which can enable autonomous learning. When used creatively, ICT can enrich and enhance teaching, motivating pupils and engaging them in **active learning.** But how is this achieved? The range of special needs covers a very wide spectrum. It will be necessary therefore to examine how ICT can support the various needs.

Standard equipment is often suitable for children with SEN. the settings of the computer can be changes to make it more computer friendly. The mouse motion can be slowed down for better control. The toolbar can be created to suit the children's needs. However if this is not suitable there are many peripherals and devices, which can support children with SEN, but not all are appropriate for everyone. For those children with a physical disability a variety of switches, optical pointers, voice controlled devices and word prediction software has been designed to overcome the problems these children have using traditional input devices such as the mouse and keyboard. However according to Semerc [2000] these alternative methods of access are more complex than direct input and therefore place an additional cognitive burden on the child. The system therefore needs to be set up so that it does not become an additional barrier. Children need to be competent with input devices such as switches. The technique may take time to develop and opportunities need to be provided to practise these to avoid frustration.

There are a variety of switches available. Some involve hand movement while others can be operated by other parts of the body; even a strong puff of breath can operate a switch. The assessment of the type of switch required is usually carried out by specialists [Hopkins, 1998]. This assessment needs to be continuous. Bowser and Reed [1995] as cited by Bryant et al [1998] argue that as a child progresses through the Education System, their requirements change and this may necessitate a need for different devices. This is not limited to those children with a physical disability but is relevant to all children with SEN as they progress and the Education System places additional burdens upon them.

For children with a visual impairment ICT can provide support in various ways such as tools to support communication, to improve access to information and as a means of producing learning materials in alternative. There is a wide range of devices and software, which can be employed according to the level of disability. For those with some sight there are screen magnification programs. These adjust the size of text and graphics and control the number of lines and words per page. However for those who are blind or who have a severe visual impairment there are devices such as 'Braille n speak' which has a built in speech synthesiser. This device is very portable making it very practical. Text to speech software is also now widely available. Moreover, technology allows children to write in Braille and produce work

for the teacher as a standard text file or to type in their work but print out a Braille copy for later revision. The needs of children with hearing impairments are very different. Those with significant hearing loss may have an obvious delay in language development. Many struggle as a consequence with reading and writing resulting in a lack of confidence. ICT can help in developing language. This group of children benefits from a variety of software. This needs to be animated and more visually stimulating to compensate for the lack of sound. According to BECTa [2001] working alongside fellow pupils on an ICT activity can encourage children to extend their use of language and their understanding of concepts as children work together. Children are able to work on an equal footing when using simulation/problem solving software and devices such as the roamer. ICT also offers another means of communication such as email for those with hearing impairment.

For those children with learning difficulties and Emotional and Behavioural Difficulties [EBD] ICT provides a non-threatening, non-judgmental environment. A learner with EBD may have one or more barrier to learning. For those who have specific learning difficulties such as spelling, frustration can lead to increased feelings of defeat andlow self-esteem. ICT can support their learning in various ways. A simple word processing or desk top publishing enables children to produce a high standard thereby increasing the children's self-confidence. Actually working on the computer according to teachers [BECTa, 2001] seems to have a beneficial effect on children's attention span. ICT may also support EBD children in developing their problem solving skills. Children with EBD are often wary of trying out new activities and taking risks. Software such as adventure programs, control, logo and simulation allow children to develop these skills. Working alongside other children on such activities may also assist in the development of their social skills.

Children who have dyslexia may have a wide range of difficulties. It is not limited to literacy skills but may also affect numeracy skills as well. ICT is a great motivator. It can assist children to acquire specific skills for reading and spelling, writing and mathematics as well as acting as a support across the whole of the curriculum. There is now available a wide range of software which can help specific difficulties such as developing memory skills. However as with choosing any aid, software must be suited to user to have full impact.

ICT provides us with the tools to deliver suitably challenging opportunities for all children enabling full participation and success. It provides the tools to give every child, regardless of disability, access to communication, learning and leisure. If used creatively by the teacher it can change the way lessons are delivered giving children with SEN opportunity to take part in everything.

How can ICT help for Hearing Impaired (HI) students?

ICT is of particular value in developing the language experiences of learners with HI. ICT can be a very visual medium, with pictures, signs or texts on screen allowing pupils to extend both their general knowledge and use of language without being dependent on the spoken word. Learners who have a HI often need opportunities to extend their use of descriptive language in order to describe, compare and contrast objects: all skills that underlie effective information handling. Collaborating on an ICT activity can encourage a group of students to extend their use of language and their understanding of concepts as they plan and carry out their work.

General Observations:

Reflection of application of CAI programme on Hearing Impaired children:

Researcher is doing research on hearing impaired children. She developed the CAI Programme on Marathi Grammar for students of sixth standard. When the programme was conducted, the students participated with much enthusiasm. They enjoyed the programme very much. The programme cleared each and every concept.

The teachers were also impressed with this programme. They wanted to know more about making the CAI programme. So, use of ICT is more important for hearing impaired children for understanding the hard concepts or content. When we cannot explain any concept without words, then we can explain it with the help of computer programmes like CAI or PPT.

We can give the training on use of ICT in teaching learning process and preparing the CAI Programmes and PPT for hearing impaired school teachers.

Conclusion:

Many of the children are fluent in using PowerPoint, and digital cameras. Video cameras are also invaluable visual tools. The children use them for self-assessment and as subjects for discussion as well as to learn ICT skills.

It is widely agreed that the most effective forms of ICT to use with deaf children are highly visual rather than being reliant on the written word or sound. Pupils enjoy using interactive smart boards to explain, demonstrate and share their work.

ICT is opening up new avenues of communication for many deaf children. Cath Scott, the ICT coordinator at Elmfield community special school for the deaf in Bristol, says: "Using email and computer-generated text gives children another choice in how they communicate. It is non-confrontational, non-judgemental and easy to edit."

―It is not about the technology; it's about sharing knowledge and information, communicating efficiently, building learning communities and creating a culture of professionalism in schools. These are the key responsibilities of all educational leaders.‖ ‒ **Marion Ginapolis**

References:

http://www.theguardian.com/education/2004/mar/22/elearning.technology

http://www.icbse.com/ict-education

http://www.unescobkk.org/education/ict/themes/training-of-teachers/guidelines/teachers-role-and-needs/

http://www.123helpme.com/view.asp?id=48614

http://edtechreview.in/news/2112-technology-in-education-quotes

Colin Lankshear and LLana Snyder with Bill Green, (2007), Teachers and techno-Literacy – Managing literacytechnology and learning in schools, Allen & Unwin, Australia.

S.Arulsamy,P.Sivakumar,(2012). Application of ICT in education, Neelkamal Publication Pvt.Ltd., Hyderabad.

-Manoj Kumar Dash, (2010) ICT in Teacher Development, Neelkamal Publication Pvt.Ltd. Hyderabad.