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INFORMATION COMMUNICATION TECHNOLOGY FOR TEACHER EDUCATION

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ABSTRACT

Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies (NICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century. Apparently, teaching profession is evolving from an emphasis on teacher - centered, lecture - based instructions to student centered interactive learning environments. NICTs integration is understood as the usage of technology seamlessly for educational processes like transacting curricular content, students working on technology to do authentic tasks and developing technology supported products, providing authentic assessements and institutional development. Today a Verity of NICTs can facilitate not only delivery of instruction but also learning process itself. Moreover, NICTs can promote international collaboration and networking in education and professional development. ICT integration in institutions is being perceived as a necessity and is growing exponentially. The pervasive use of technology in all spheres of life, the knowledge economy and the paradigm shift together, generate demands on the institutions to adopt ways that help inculcate 21st century skills amongst students.

KEY WORD

Information Communication, Education, Technology,

"If a country is to be corruption free and become nation of beautiful Minds, I strongly feel there are three key societal members who can Make a difference. They are the Father, the Mother and the Teacher".

- Dr.A.P.J.Abdul Kalam, Former President of India.

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Introduction

Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time (Perraton, Robinson and Creed, 2001). As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills. Recent developments of innovative technologies have provided new possibilities to teaching profession but at the same time have placed more demands on teachers to learn how to use these technologies in their teaching. (Robinson and Latchem, 2003).

Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies (NICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century. Apparently, teaching profession is evolving from an emphasis on teacher - centered, lecture - based instructions to student centered interactive learning environments.

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The knowledge revolution and role of the teacher

The pace of technological revolution and emergence of a knowledge society can change the traditional role of the teacher and the students. Traditionally, the teacher used to be the source of knowledge for the students. There is some cooperation among students to explore new knowledge. In many cases, the teachers do not posses adequate knowledge to supplement the view of the student. And the main source of knowledge remains limited to text book. The development of ICT Changes the epic centre of knowledge. At present, in a number of cases the student is more informed than the teacher. Furthermore, there is likely to be confusion in the teachers mind about his/her new role in relation to the use of these technologies i.e. teachers find themselves in a situation where they are no longer the principle source for delivery of information. In the new phase of the knowledge revolution the source of knowledge has shifted from a one source to a different source. In other words, we can say that there is a decentralization of the knowledge source. This has an overall impact on the development of learning abilities among the children. There is a need to facilitate training on

ICTs for teacher both at the pre service level and in service level.

Role of Teacher in Enhancing Learning Achievement of Child

Education, as we know is instrumental in ensuring that the future generation is well informed and competent. Unfortunately, because the quality and accessibility of education varies so greatly between regions, the school system of our country often fails to deliver the level of education necessary to ensure such competency. Many schools have limited resources for buying books, stationery, furniture and other classroom materials. Teachers lack adequate qualification and training to engage their students in learning. Their lesson plans are most often outdated or irrelevant. These jeopardize the available quality of education. ICT enabled distance education, to a great extent, can combat this problem. Because the present day distance learning is ICT- enabled, most of the programmes include computer and Internet training to facilitate the use of essential technology.

ICT a solution for the improvement of the expertise of teacher

ICT enable distance education is poised to rule the world. This would not only strengthen the elementary education needs of the country but would also increase the dependence of education on ICT. Technological development always warrants transition to newer technologies by jeopardizing the cost effectiveness of the distance education programme. Retaining the already existing technologies for a considerable period of time and subsequently embracing new technologies should have fine balancing, so as to improve also the quality of education. India is one among the few countries in the world, which ahs not allowed the expenditure on education to shrink over the years.

ICTs and Teacher Education

There are a variety of approaches to professional development of teachers in the context of use of ICTs in education. Professional development to incorporate ICTs into teaching and learning is an ongoing process and should not be through of as one injection of training. Teachers need to update their knowledge and skills as the school curriculum and technologies change. Two aims of teacher training are fundamental. teacher education in ICTs; and teacher education through ICTs.

Teacher Education in ICT

The most obvious technique for professional development for teachers is to provide courses in basic ICTs knowledge and skills. It is necessary for teachers to become skilled in operating the new technologies and in exploiting them effectively as educational tools. Teachers must master the use of information - skills of research, critical analysis, linking diverse types and sources of information, reformulating retrieved data if they are to teach their pupils to develop these same skills. There needs to be more emphasis placed on training in pedagogy, as opposed to the current trend in many education systems where the major focus is on specialized knowledge in specific curricular subjects. Teachers must be adequately equipped with more didactic competencies so as to assume their new role as experts in the learning process.

Teacher Education through ICTs

ICTs can support effective professional development of teachers. Using ICTs as tools for training of teachers is as important introducing the basics of ICTs to the prospective teachers. As sources of information and expertise, as well as tools for distance communication, ICTs can offer many new possibilities for teacher education. Teachers may through the regular use of these technologies. Use of new media, new rules of communication - even a new language - have to be learned.

Approaches to ICT Integration in Teacher Education

Use of ICT within teacher - training programs around the world is being approached in a number of ways with varying degrees of success. These approaches were subsequently described, refined and merged into four primary approaches as follows.

ICT skill development approach: Here importance is given to providing training in sue of ICT in general. Student-teachers are expected to be skilled users of ICT in their day - to-day activities. Knowledge about various software, hardware and their use in educational process is provided.

ICT pedagogy approach. This approach emphasizes on integrating ICT skills in respective subjects, drawing on the principle of constructivism, pre-service teachers design lessons and activities that centre on the use of ICT tools that will foster the attainment of learning outcomes. This approach is useful to the extent that the skills enhance ICT literacy skills and the pedagogy allows student to further develop and maintain these skills in the context of designing classroom-based resources. Students who have undergone this type of training have reported significant changes in their understandings associated with effective implementation strategies, as well as their self-efficacy as to their ICT competencies.

Subject- specified approach: Here ICT is embedded into one's own subject area. by this method teachers not only expose students to new and innovative ways of learning, but also provide them with a practical understanding of what learning and teaching with ICT looks and feels like. In this way, ICT is not an add on', but an integral tool that is accessed by teachers and students across a wide range of the curricula.

Practice- driven approach: Here the emphasis is on providing exposure to use of ICT in practical aspects of teacher-training also. Emphasizing on developing lessons, assignments etc. using ICT and implementing these in their practical work experience at various levels, the students are provided with an opportunity to assess the facilities available at workplace and effectively use their own skills to manipulate these facilities. Based on the concept that the pre-service teacher is a learner, manager, designer and researcher, he is expected to research their practicum school's ICT facilities, design ICT activities with their tutor-teacher, manage those activities in the classroom, and evaluate their effectiveness in terms of student learning (http://ww.nd/edu.au) Ideally, an integrated approach is to be followed for developing ICT skills in teaching. Whatever may be the approach followed in the institutions to develop knowledge about ICT, it has its own limitations and coupled with other reasons,

they are not making student-teachers fully confident of using ICT in their day-to-day classrooms and other situation.

Developing 21st Century skills

Globalization and advancements in technology are driving changes in the social, technological, economical, environmental and political landscapes at such a pace and magnitude that is too great, and too multiple to ignore. As society changes, the skills that students need to be successful in life also change. Basic literacy of reading, writing and mathematics are no longer sufficient. Our students need to master those basic skills as well as read critically, write persuasively, think and reason logically, and solve complex problems. A successful student must also be adopting at managing information-finding, evaluating, and applying new content understanding with great flexibility. They must be equipped with skill and perspectives designed to help them anticipate change and plan accordingly. This will equip them to thrive in a world characterized by rapid continuous change. A simple question to ask is how has the world of a child changed in the last 150 years? and the answer is "it is hard to imagine any way in which it hasn't Challenged! But if you look at school today versus 100 years ago, it is more similar than dissimilar." The challenge is to overcome traditional ways, and change pedagogical practices in way that reflect the changing social, political and economic landscape in which 21st century students will learn.

In order to thrive in a digital economy, students will need digital age proficiencies. It is important for the educational system to make parallel changes in order to fulfill its objectives, namely, the preparation of students for the world beyond the classroom. Therefore, the educational system must understand and embrace the 21st century skills within the context of rigorous academic standers. Schools, just like businesses, industries and families, must adapt to these changes and bridge the gap between how students live and how they learn. Accelerating technological change, rapidly accumulating knowledge, increasing global competition and rising workforce capabilities around the world make 21st century skills essential.

The following is a list of 21st century skills, which all allows students to prepare for careers, requiring them to acquire new knowledge, learn new technologies, rapidly process information, make decisions and communicate in a global and diverse society.

Information and media literacy skills: Analyzing accessing, managing, integrating, evaluating and creating information in a variety of forms and media.

Communication skills: Understanding, managing and creating effective oral, written and multimedia communication a variety of formed and contexts.

Critical thinking and systems thinking; Exercising sound reasoning in understanding and making complex choices, understanding the interconnections among systems.

Problem identification, formulation and solution: Ability to frame, analyze and solve problem.

Creativity and intellectual curiosity: Developing, implementing and communicating new ideas to others, staying open and responsive to new and diverse perspectives.

Interpersonal and collaborative skills: Demonstrating teamwork and leadership'; adapting to varied roles and responsibilities; working productively with others; exercising empathy; respecting diverse perspectives.

Self- Direction: Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another.

Accountability and adaptability: Exercising personal responsibility and flexibility in personal workplace and community contexts; setting and meeting high standers and goals for one and others; tolerating ambiguity.

Social Responsibility: Acting responsibility with the interests of the larger community in mind, demonstrating ethical behavior in personal, work place and community contexts. There is a need for students to develop learning skills that enable them to think critically, analyze information, communicate, essential role that technology plays in realizing these learning skills in today knowledge -based society

Communicate effectively; Students must have a range of skills to express themselves not only through paper and pencil, but also audio, video, animation, design software as well as a host of new environments. (e.g. E-mail, websites, message boards, blogs, streaming media, etc.)

Analyze and Interpret Data: Students must have the ability to crunch, compare, and choose among the glut of date a now available web-based and other electronic formats.

Understand Computational Molding: Students must possess an understanding of the power, limitations, and underlying assumptions of various data representation systems, such as computational models and simulations, which are increasingly driving wide range of disciplines.

Manager and Priorities Tasks: Students must be able to manage the multi-tasking, selection, and prioritizing across technology application that allows them to move fluidly among teams, assignments and communities of practice.

Engage in problem solving: Student must have an understanding of how to apply what they know and can do to new situations.

Ensure security and Safety: Students must know and use strategies to acknowledge, identity, and negotiate 21st century risks.

Looking into the role and importance of 21st century skills in the present world, it becomes vital for college of education to incorporate 21st century skills in their curriculum so that future teachers are equipped with skill and strategies to promote 21st century skills among students. Incorporating various methodologies like activity - based learning, problem-

based learning, project- based learning class room practices will lead to promote 21st century skills among students.

Impact of ICT on Teacher - Educators and Students Teachers

1. It acts as the gateway to world of information and enables teachers to be Updated.
2. For professional development and awareness of innovative trends in Instructional methodologies, evaluation mechanism etc.
3. For effective implementation of certain student centric methodologies such as project-based learning which puts the students in the role of active researchers and technology becomes the appropriate tool.
4. it is an effective tool for information acquiring- thus students are encouraged to look for information from multiple sources and they are now more informed then before.
5. It has enabled better and swifter communication, presentations of ideas are more effective and relevant. \
6. The dissemination of ideas to a larger mass now seems possible due to technology.
7. Student - teachers are transformed into self learner.
8. ICT creates awareness of recent methodologies and thus teacher educators feel empowered.

ICT Training Inputs for Teachers and Teacher Educators.

For the successful implementation of ICT, teacher trainees, teachers and teacher - educators need to be trained in the following dimensions. The commercially available training programmes are designed to provide exposure only to system software, some of the application software and the basics of internet.

1. Awareness phase: The input should be to make the teachers aware of the important and possibilities of ICT-the current trends and future projections.
2. Learning theories and technology integration: Traditional and modern view of learning shift from teaching to learning, constructivism, role of ICT in lifelong learning.
3. Basic hardware skills: Hands on experience in operating a) the PC and laptops-switching on, shutting down, and networking, b) storage devices - using floppy drive, CD ROM drive, flash drive, and burning CD-ROM, c) output devices- using printers and speakers, d) input devices - using keyboard (Including shortcuts), mouse, modem, scanners, web cam, digital camera, camcorders, date loggers and d) display devices-data projectors, and interactive white boards.

4. Understanding system software: Feature of desktop, starting an application, resizing windows, organizing files (Creating, editing, saving and renaming), switching between programmes, copying etc.

5. Using application/productivity software: Word processing, spreadsheet, database, presentation, publishing, creating of Portable Document Format (PDF) files, test generation data logging, image processing etc.

6. Using multimedia: Exposure to multimedia CD ROMs in different subject, installing programs evaluating CD ROMs, approaches to using CD ROMs creating multimedia presentations.

7. Using Internet: e-mail, communities, forums, blogging, wiki: subscription to mailing lists, e-mail and internet projects, web searching strategies (navigating, searching, selecting, and saving information) videoconferencing, designing web pages, freeware and shareware, evaluating website resource, virtual fieldtrips, learning opportunities using the web and netiquette.

8. Pedagogical application of ICT tools: Specific use of application software in different subject, appropriate ICT tools and pedagogy, unit plan integrating ICT tools, approaches to managing ICT- based learning groups, assessment of learning, electronic proteomic portfolio and assessment rubrics, creating teachers and student support materials, supporting students with special needs.

9. Introduction to open source software; Concept, types, advantages, working on open sources application software.

10. Social legal, ethical and health issue: Advantages and limitations of computer use, privacy violations, copyright infringement, plagiarism, computer security (hacking, virus, misuse, abuse and staying safe)healthy use (seating, light, sound, radiation, exercise)

11. ICT for professional and personal productivity: ICT for administration, record keeping, reporting and transfer of information, attendance, research, careers in computers and professional development opportunities.

Conclusion

As an advanced training website development, installation and use of server based applications, training in course management system, e learning course content development using various authoring tools, audio/video/image editing, animation etc. can be introduced. In addition to the hands on experiences every training program could include an ICT awareness /familiarity quiz, exhibitions of ICT books and multimedia CD ROMs by commercial agencies, poster session on success stories, case study presentations and analysis, ICT based demonstration lesson in the schools (whole class, small group, internet based, etc) exhibitions and presentations by commercial agencies on emerging technologies.

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