EFFECTIVE INTEGRATION OF ICT IN EDUCATION: 21ST CENTURY SKILLS BASED SUSTAINED PROFESSIONAL DEVELOPMENT FOR TEACHERS

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ABSTRACT: Technology and innovation have brought tremendous change in the way the students learn. With a global network, newer avenues and resources of learning available, technology exposure and technology adoption amongst students is higher and learning is no longer confined to the classrooms. For the students to take effective advantage of technology, the teachers have to play a key role not just as imparters of knowledge but also as facilitators who will guide the students in using technology for their benefit. The teachers need comprehensive and sustained professional development opportunities that cultivate multiple skills such as knowledge managers, developers of learning strategies and facilitators of technological and innovative methods of learning. Sustained Professional development of teachers is necessary to play these diverse roles and for systematic improvement in technology adoption by teachers as compared to students. Countries all over, including India are recognizing the fact that the traditional forms of professional development such as workshops, and one-time training sessions on Information Communication Technology (ICT) skills are proving to be inadequate. What is required is sustained professional development that takes a more holistic approach with out isolating ICT skills and pedagogical aspects. Teachers must learn to add to their individual development by drawing experiences from others through online networks and information exchange systems thus forming their own personalized learning networks. Further for systematic education transformation through ICT an integrated approach to professional development is necessary that focuses not only on teachers but also on other stakeholders as well.
INTRODUCTION

*If we teach today as we taught yesterday, we rob our children of tomorrow.*

*John Dewey*

The role of the teacher in the future is being predicted as that of a learning facilitator, with expertise in knowledge management and learning strategies, implying a requirement of a variety of skills and competencies, which most of today’s teachers may not be equipped with. With the emergence of new technologies and methods in education, the role of the teacher is gradually changing. How will the teachers be equipped to play the role of effective facilitators in this changing scenario of globalized networks? How is professional development for teachers correlated to student achievement? Will the traditional approach of one-time workshops be enough to prepare the teacher for their changing role in molding the learners? This paper will shed light on providing the 21st century teachers with sustained professional development through newer methodologies, so that they can address the changes in the learning scenarios with the emergence of new technology innovations and pave the way for greater student achievement.

With the presence and the relevance of technology in education not being questioned anymore, the focus has shifted to how it can be effectively used in learning to promote student achievement. *However, no technology can transform on its own.* For technology to be impactful in education, teachers must integrate technology in the curriculum in such a way that it aligns with student learning goals. "Teacher quality is the factor that matters most for student learning," according to Darling-Hammond and Berry (1998). Therefore, to improve the quality of learning using technology, teachers must equip themselves with the required skills, making professional development for teachers a key issue in education.

Technology is becoming increasingly adaptive and individualized, with technological innovations providing access to personalized information and tools, impacting the students of today at an alarmingly rapid pace. Classroom learning is competing with learning through the internet, using web 2.0 technologies, connecting with classmates, peers and experts using Internet messaging and using other popular online interactive tools. Learning is not dependant on information access as guided by the traditional teacher only, but is being
constantly either reinforced or negated by many other sources of information available due to technology.

Teaching practice needs to be adaptive. It is not realistic to expect all students to learn at the same pace and by the same sequential thought process. Students will differ on abilities, learning styles and will require additional information and help at different times. Ideally, the educational process should be able to adapt to the changing ability of the learner to assimilate information, comprehend concepts, principles, and relationships, and master the skills as required to attain the learning objectives. Instruction should be interactive. Students should be able to ask, as well as attempt to answer questions. Curriculum needs to be flexible for students to pursue diverse avenues of learning, to engage in inquiry, exploration, creativity and discovery.

Contextualizing learning in the larger societal framework of today’s global knowledge economy is forcing the education systems across the world to rethink current systems and practices. Increasing advocacy from potential employers on skills required from its workforce, are pushing for a reorientation of today’s classrooms. Education consultant and advisor Tony Wagner has conducted interviews with business leaders and observed classrooms and discovered a disconnect between what potential employers are looking for (critical thinking skills, creativity, and effective communication) and what our schools are providing (passive learning environments and lesson plans that only focus on test preparation and reward memorization). Based on his work, Tony Wagner has outlined seven skills that will be necessary for the students of today to develop in order to survive the workforce challenges of tomorrow.

- Critical Thinking and Problem-Solving
- Collaboration across Networks and Leading by Influence
- Agility and Adaptability
- Initiative and Entrepreneurialism
- Effective Oral and Written Communication
- Accessing and Analyzing Information
- Curiosity and Imagination

In today’s global knowledge economy, students need new skills and the failure to provide for this development will lead to a competitive disadvantage. *Schools have not changed, while the world has.* Additionally, the increasing impact of media and technology on how students relate to
the world and learn from their experiences are forcing educators to rethink the way teachers need to be trained, retrained and supported.

THE ROLE OF THE TEACHER

*Be the change you want to see.*

*M.K. Gandhi*

The learning process is no more confined to a traditional classroom setting. The scenario of the future demands that teachers act as learning facilitators to students on an individual basis in a wider network. Teachers must be prepared to break out of the traditional teaching methods and locate learning resources from different avenues that include both online and conventional methods. The activities selected should promote personal development as well as opportunities to engage in collaborative teamwork. The future Learning Management Systems should allow students and teachers to proactively identify assessment opportunities against a range of criteria, capabilities and competencies. These assessment opportunities should be analyzed to develop remedial programs and enable the teachers to improve their strategies.

In this context, the role of the teacher encompasses the need to understand and use technology for producing the best results in learning. “The transformation of classroom technology from hardware, software, and connections into tools for teaching and learning depends on knowledgeable and enthusiastic teachers who are motivated and prepared to put technology to work on behalf of their students,” notes the CEO Forum on Education and Technology (1999). This being said, though many teachers have the functional know-how of technology, they do not possess the necessary knowledge to recognize the complete potential for technology usage in teaching and learning, nor the skills to exploit technology for maximum benefit.

“Most teachers want to learn to use educational technology effectively, but they lack the time, access, and support necessary to do so” (Guhlin, 1996). The teachers must progress from a phase of just knowing how to use a computer to a phase where they become fearless in their use of technology and integrate it effectively in their learning strategies, powered with the knowledge of the many opportunities that technology offers.
Therefore, professional development for teachers becomes the key issue in using technology to improve the quality of learning in the classroom. “Lack of professional development for technology use is one of the most serious obstacles to fully integrating technology into the curriculum.” (Fatemi, 1999). To prepare the teachers for effective technology use, a well-designed professional development program is mandatory. But, what is also important is the implementation and execution of the professional development program. The traditional forms of individual workshops and one-time training sessions are no longer adequate. What is required are sustained, ongoing and improved professional development programs which will provide the teachers with support and make technology an integral part of their professional lives.

**INDIA: RESPONDING TO CHANGE**

_Education is the most powerful weapon which you can use to change the world._

_Nelson Mandela_

India’s gradual rise in last two decades as a knowledge power in global economy is attributed to the quality of intellectual and human capital it has produced. The period is also marked by profound changes in education delivery, knowledge creation, and innovation. The subcontinent has made significant progress in education in areas related to education access, retention and overall education quality improvement since the introduction of National Policy on Education in 1986. _Since 2005, the education system is focusing on 21st century education and has aligned educational objectives and outcomes with the success of the nation in the global knowledge economy._ Providing professional development to a large number of diverse teacher populations, varying in skills and competencies has always been a challenging task for education policy makers and implementers in India, especially in re-molding teachers' thinking from traditional teaching practices to student centered pedagogy and developing skills that involve the effective usage of ICT tools. In the recent past there is great emphasis and investment by the state and central governments for ICT in education implementation.

However, the various ICT initiatives in education do not comprehensively address the preparedness of teachers for 21st century education and ICT integration. Training of teachers is critical to implementation and success of the ICT in education programs in India. Departments of Education across various states having understood the importance of
professional development for a diverse country like India, have taken various initiatives to provide a bouquet of professional development programs for teachers.

**PROFESSIONAL DEVELOPMENT – THE CHANGING PARADIGM**

*Do not confine your children to your own learning, for they were born in another time.*

*Chinese proverb*

Professional development for education transformation is very integral to success of ICT in education programs, but most ICT focused teacher professional development programs have been by and large reactive to the environment causing a wide gap between student ICT usage and teacher professional development programs on ICT innovation. Based on experiences of promoting integration of ICT in education in schools and implementing professional development programs for teachers, it has been observed, that student adoption of ICT innovation is way ahead of the technological infrastructure provided in schools followed by the professional development practices and opportunities for teachers (as depicted in Figure 1) leaving them with a distinct disadvantage to direct the students for optimum technology usage for learning.

*Figure 1: Adoption of Technology Innovation*

*How can professional development envision teachers to create learning opportunities, which will have a positive impact on student achievement?*
Traditional training sessions have not been effective in making teachers comfortable with using technology or adept at integrating it into their lesson plans at the pace of either, technology innovation, student adoption or even infrastructure deployment in schools. The key focus of the professional development exercises should be education transformation through ICT and not mere skill building training programs. The first step towards successful planning of professional development programs is to identify the various multi-level stakeholders. The below suggested model (Figure 2) throws light on the various education stakeholders who are an integral part of education transformation through ICT. The focus should be at a holistic professional development approach at all levels.

![Figure 2: Integrated Stakeholder Professional Development Model](image)

**PERSONALIZED PROFESSIONAL DEVELOPMENT LEARNING NETWORKS**

The last few decades have belonged to a certain kind of person with a certain kind of mind - computer programmers who could crank code, lawyers who could craft contracts, MBA’s who could crunch numbers. But the keys of the kingdom are changing hands. The future belongs to a very different kind of person with a different kind of mind – creators and empathizers, pattern recognizers and meaning makers. These people – artisans, inventors, designers, storytellers, caregivers, consolers, big picture thinkers – will now reap society’s biggest rewards share its greatest joys.

*Daniel Pink*
Research on the link between teacher learning and student achievement can be divided into two waves. The first wave focused chiefly on traditional teaching methods, whereas the second wave had a student centered approach with importance to reasoning and problem solving skills of the students. The second wave highlighted the relevance on the professional development as the key to improved student achievement.

In the present day and in the future, professional development will not be just limited to learning new teaching techniques, but needs to be a sustained and continuous process to learn and employ new forms of learning in the practice of teaching. This makes it important for teachers to effectively navigate their individual development through the metamorphosis of their role by drawing experiences from peers. To adopt the tools available, the 21st century teachers have to be the change they want to see in the students. The 21st century teacher can no longer be restricted to the curriculum, classroom and staff room colleagues.

Easy access to web based communication and networking tools in a large globalized community, have made personalized learning networks a reality and a necessity. These networks, work as a platform for knowledge sharing rather than information gathering, thus making the platform a source for both personal and, collective and collaborative intelligence. With technology providing the tools, it is up to the individuals who form the network to make the platform an effective, interactive and meaningful learning environment. Teachers, as ‘actors of change’, specialized in preparing students for the new job market should embrace forms of learning mediated by such personalized internet environments, which are a more effective alternative to standard, traditional teacher professional development.

Various Studies conducted have conclusively proven that in an online network based model of professional development, for learning to flourish, it is essential that the participants be flexible in their approach and the curriculum adopted to be open to progressive changes. It is with reference to such a learning model that Oliver and Herrington (2000) opine that the core of the model lies in an authentic learning context which is not only based on realistic learning practices but also on an individual’s own needs and practice requirements. The curriculum adopted by the participants in this dynamic online learning environment derives strength from its informal, non-prescriptive nature which supports spontaneous and friendly interaction through collaborative activities undertaken and thus constantly develops along with the learners. Such a curriculum “as a field of learning resources in everyday resources in everyday practice viewed from the perspective of the learners” (Lave & Wenger, 1991) has a
significant impact on not just the creation but also the retention of a productive and meaningful online learning environment. It is to be noted that while technology has an undeniable role to play in connecting people, it is up to the participating teachers to put in the efforts that will transform their experience into one that enriches their professional development.

The wholehearted involvement of teachers in an approach that calls for continuous interaction with others in the learning community is undoubtedly important not only for constantly upgrading their knowledge base, but also for ensuring that they are able to train themselves in the manner required by those who will train existing as well as future generations of learners. Such an involvement will also ensure that the teachers feel confident to usher the pedagogy of change that emphasizes on a student-centric learning process wherein the student apart from being the focal point of the learning process also takes the onus for lifelong learning. In this scenario, the role played by technology becomes that of the binding force; one that bridges the connection between people and gives them a space to come together and build as well as sustain a learning environment through productive activities and interaction.

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Wesch, M. (2009). From Knowledgable to Knowledge-able: Learning in New Media Environments
BIODATA: A Ph.D. in Education and having over two decades of experience in providing innovative solutions to schools, Dr. Anjlee Prakash brings with her a wealth of understanding on the requirements of today’s schools. She has worked extensively with the Indian State and Central Government and the Private sector on Education and Community Development Programs. She has also developed extensive educational content for use by teachers using ICT in the teaching-learning process with guidelines for effective delivery.

Dr. Anjlee Prakash founded the Education Quality Foundation of India (EQFI) with the belief that improving quality standards in education can significantly improve learning experiences and enhance lives. EQFI aims at evangelizing and benchmarking “quality in education”. Dr. Anjlee is currently CEO of Learning Links Foundation, a trust providing a variety of services for the developmental sector, focusing on interventions in the Education and Community Development Sector.

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