



MODELS AND BEST PRACTICES FOR TEACHER'S PROFESSIONAL DEVELOPMENT FOR ICT

Geeta Singh, Prof.,

*UGC-Academic Staff College , B.P.S. Mahila Vishwavidyalaya,
Khanpur, Sonapat, Haryana-131305 ,India*

Abstract

This paper presents examples of models and best practices in Teacher Professional Development (TPD) for ICT in Education. In the education sector, Information and communication technologies have brought new possibilities and demands on teachers. They themselves need to be very well equipped with the nitty-gritty of the ICT's to prepare the students in their effective use and implementation and lead them towards self-learning. Therefore, the teachers need to realize the importance of their awareness regarding the use of ICT and bring about a change in their role as transformative agents who through professional development would be able to provide practical skills related to ICT. The paper will also talk about the educational implications related to the teachers' professional development for the effective and efficient utilization of ICT. The paper also highlights that the application of models and practices should be of high quality and relevant to teachers' needs for bringing about effective teaching-learning process in the classroom.

Keywords: *Teacher Professional Development (TPD), ICT, TDP Models.*

Conceptual Framework

Professional development is defined as activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher. This definition recognizes that development can be provided in many ways, ranging from the formal to the informal. It can

be made available through external expertise in the form of courses, workshops or formal qualification programmes, through collaboration between schools or teachers across schools or within the schools in which teachers work. Education changes, in particular those changes associated with the rhetoric of the global Information society, require staff development activities. In order for changes to be affected in the classroom, additional technical and pedagogical support is necessary. Professional Development programmes should include all ‘staff’ that are to contribute to the implementation of the intended changes – school principals, teachers, and technical and administrative support personnel. Apart from the students themselves, teachers and school leadership are the main agents of change at the school level.

Information and communication technologies have brought new possibilities to the education sector, but at the same time, they have placed more demands on teachers. They now have to learn how to cope with computers in their classrooms, how to compete with students in accessing the enormous body of information – particularly via the internet and how to use the hardware and software to enhance the teaching/learning process.

Bhatta (2008) would contend that unless teachers are fully comfortable with new approaches to teaching inherent in ICT integration, providing students with computers and educational content alone will have limited impact on the teaching and learning process. It is also essential that teachers understand that ICT-based education only changes their role, rather than minimizing or eliminating their role altogether. Butler and Leahy (2003) would argue that there is a need to develop teachers’ thinking to that of ‘critical judgment’ to ensure that teachers are not limited by their current understandings and experiences of digital technologies as a somewhat intimidating new dimension to their classroom practices. They add that there is a need for teachers to be provided with opportunities to reflect on their practice as they make use of the technologies so that they can become *active generators* rather than *passive consumers* of knowledge. Teachers they believe must be empowered as transformative agents who through professional development should cultivate “*knowledge of practice*”

A New Paradigm for Teacher Education

Swarts notes the need for teachers “to be adequately and appropriately trained through pre-service and in-service teacher education programmes to teach ICT Literacy”. She considers that access to ongoing and appropriate ICT professional development is a prerequisite for *all* teachers, if they are to improve their confidence and competence in using ICT to meet the needs of *all* their students. Pelgrum and Law believe that teacher education, and in particular initial teacher education needs to undergo changes to prepare teachers for the challenges of the information age.

Bhatta (2008) considers that effective teacher preparation in ICT-based education requires adequate training in three areas:

- Information technology literacy
- Child-centric interactive teaching
- Integration of ICT-based instruction in child-centric interactive teaching.

She notes that the most straightforward task is making teachers IT literate with the Greatest challenge lying in the third area of ICT integration.

Pilgrims and Law point to empirical data from cross national surveys suggesting a lack of ICT training opportunities in pre and in-service programmes generally. Furthermore the courses available predominately focus on the basic technical skills to the detriment of courses related to the gap areas of pedagogical/ didactical principles. Loveless also notes the tendency in current international models of professional development to focus on evidence of *teaching competence* rather than *confidence in change*. Such approaches can leave teaching and learning largely unaffected in schools and can greatly hinder the potential of digital technologies to radically alter the manner in which teaching and learning are constructed. They also inhibit the opportunity for critically examining education systems and for questioning, “The very nature of what we understand by learning” contends that a new paradigm for teacher education must emerge that replaces one-shot training with lifelong professional preparedness and development of teachers along a continuum of

- a) Initial preparation,
- b) structured opportunities for retraining, upgrading and acquisition of new knowledge and skills.

c) Continuous support.

Models for Teacher Professional Development (TPD)

TPD (also known as “in-service” or “teacher education”) is the instruction provided to teachers to promote their development in a certain area. It is the tool by which policymakers’ *visions for change* are disseminated and conveyed to teachers. Though the recipient of TPD is the teacher, the ultimate beneficiary is the student. Thus, *teacher professional development is often the most critical component of any ICT project.*

According to Gaible and Burns TPD can be divided into three broad categories:

▪ **Standardized TPD**

The most centralized approach, best used to disseminate information and skills among large teacher populations

▪ **Site-based TPD**

Intensive learning by groups of teachers in a school or region, promoting profound and long-term changes in instructional methods

▪ **Self-directed TPD**

Independent learning, sometimes initiated at the learner’s discretion, using available resources that may include computers and the Internet. The three models are described in more detail below.

1. Standardized TPD

Standardized TPD typically represents a centralized approach, involving workshops, training sessions and in many cases the cascade model of scaled delivery. Standardized, training-based approaches generally focus on the exploration of new concepts and the demonstration and modeling of skills. When employed in accordance with best practices standardized approaches can effectively:

- Expose teachers to new ideas, new ways of doing things and new colleagues.
- Disseminate knowledge and instructional methods to teachers throughout a country or region.

- Visibly demonstrate the commitment of a nation or vendor or project to a particular course of action.

Strengths:

- Standardized TPD can be very effective in building awareness about computers, learner-centred instruction and/or new curricula.
- In the cascade model (training the trainer), a small group of teachers are selected to receive intensive training before returning to their own institutions to provide ICT training for their peers – serving as ‘champion teachers’ or a “vanguard team”.
- The cascade model has tremendous potential particularly with regard to support provision at school level.

Weaknesses:

- The model tends towards a technical rationalist approach.
- The approach hovers on a ‘one fit for all’ principle for upgrading teachers’ knowledge base that is independent of context.
- Teachers are constructed as *knowledge consumers* with the responsibility to bring what they have learned back to their classrooms and put it into practice.
- Workshops taking place at one time and in one location without on-going support rarely result in effective changes for teaching and learning.
- Weaknesses in the cascade approach are linked with a tendency to develop the vanguard team’s *user* skills as opposed to their *provider* skills.
- Cascade training flows down through levels of less experienced trainers until it reaches the target group; in the process, complex information tends to be lost.
- Without incentives to motivate teachers to participate, collaborate and experiment with new strategies, teachers may be unwilling to ‘take advantage’ of their ‘more knowledgeable’ colleagues in the TPD ‘vanguard teams’.

To bring about change will take more than the exchange of information typical of “make and take” top-down centralized models for professional development programmes. Research findings indicate that informal contact and communication between teachers is the most prevalent form of transferring ICT knowledge.

2. Site-Based TPD

Site based TPD often takes place in schools, resource centers or teachers colleges.

Teachers work with local (“in house”) facilitators or master teachers to engage in more gradual processes of learning, building master of pedagogy, content and technology skills. Site based TPD often focuses on the specific, situational problems that individual teachers encounter as they try to implement new techniques in their classroom practices.

Site-based models tend to:

- Bring people together to address local issues and needs over a period of time.
- Encourage individual initiative and collaborative approaches to problems.
- Allow more flexible, sustained and intensive TPD.
- Provide ongoing opportunities for professional learning among a single set of teachers.

Strengths:

- Many studies have pointed to the importance of site-based TPD programmes which can be linked to change and innovation at the classroom and school level .
- Study findings also suggest that site-based TPD can be most effective when delivered “*in connection with a school development plan*” .
- The tendency in site-based TPD is to support the establishment of teacher communities as communities of practice in order to foster the development of the new learning culture desired .
- The focus is on aiding the project participants to not only implement new approaches but to “*unlearn the beliefs, values, assumptions and culture underlying their practice*”. Butler and Leahy point to value of incremental learning associated with site-based communities of practice - where every participant has their own perspectives, values and assumptions that become part of the process of constructing new understandings, as in “forming and reforming frameworks for understanding practice: how students and teachers construct the curriculum...” .

Weaknesses:

- Site-based approaches are time- and labour intensive requiring locally-based TPD providers skilled in facilitation, instruction, content, curriculum, assessment and technology – as well as in mentoring teachers to find solutions in low-resource environments appropriate to their needs and contexts.
- The establishment and maintenance of a network of facilitators to meet the needs of large-scale TPD programmes would be a challenge for any educational system. In the teacher-poor education systems of the LDCs, the challenge is magnified.

3. Self-directed TPD

In self-directed TPD, teachers are involved in initiating and designing their own professional development and would share materials and ideas as well as discuss challenges and solutions.

Strengths:

- This approach to professional development helps teachers to become models of lifelong learners.
- Informal versions of self-directed TPD find teachers seeking out experienced colleagues for advice or searching for lesson plans on the Internet.
- The emergence of on-line communities of teachers to provide support in professional development across a range of subject areas and themes. Gaible and Burns (2005) consider that while teachers should certainly be encouraged to participate in ongoing, self-motivated learning, self-directed activities should *not* be used as the *primary* means of providing TPD. Instead, they should be used to complement and extend standardized and/ or site-based TPD.

Teacher Competency Standards

Teacher professional programmes whether initial or in-service will constitute an important component of educational improvement only if the professional development is focused on *specific changes in teacher classroom behaviors* and particularly if it is aligned with other changes in the educational system. The goal of the UNESCO (Online) “ICT Competency Standards for Teachers” (CST) project is to combine a focus on ICT skills development with

emergent views in pedagogy, curriculum, and school organization. The Standards are designed for the professional development of teachers who want to use ICT skills and resources to improve their teaching, collaborate with colleagues, and perhaps ultimately become innovation leaders in their institutions.

Implementation strategies to encourage the use of ICT in traditionally important teaching practices (as ‘care’) would include:

- the provision of training on baseline technology skills for teachers and students;
- the provision of a good technology infrastructure, including computer access and network connectivity, to teachers and students;
- challenging the teacher education institutions to systematically integrate ICT into the teacher education programmes, as well as to become actively involved in supporting the change process; and
- the establishment of centres for learning technology in teacher education institutions to support the systematic integration of ICT for educational purposes within these institutions as well as in the school affiliated to them

Implementation strategies to support the development and widespread adoption of emergent teaching practices (as ‘courage’) would include:

- the stimulation, solicitation and funding of project proposals that aim to create examples of desired future arrangements of an education that integrates the use of ICT in ways that would develop students’ lifelong learning abilities and move schools in the direction of a learning organization;
- the establishment of experimental teacher education programmes to develop new approaches to teacher education with the aim to transfer knowledge and experiences to regular training programmes; and
- to engage universities and research centres in research integrated with programmes of action on the use of technology in education to develop an adequate knowledge base to guide school efforts.

For addressing the above issues, curriculum and teacher education institutions should make the following provisions for making the entire teaching- learning effective:

1. Organizing Training Programmes for Teachers:

The provision of ICT access and an educationally sound ICT training programme can only have the required impact if the public administration fully supports this major transformation. Respective governments need to look carefully into the necessary pre-requisites and consequences of ICT integration at the level of curriculum development, the examination system, and teacher incentives, among others. Efforts are needed to mainstream ICT appropriately in all subject curricula. The examination systems should be modernized to support ICT rich curricula. As the first institutions are getting ready to offer comprehensive ICT teacher training based on educational principles and targeting subject teachers, the government could support the existing and upcoming professional development initiatives. A clear incentive package could make it attractive for teachers to undertake similar training. For the successful implementation of ICT, teacher trainees, teachers and teacher-educators need to be trained in the following dimensions. The commercially available training programs are designed to provide exposure only to system software, some of the application software and the basics of internet.

- **Awareness phase:** The input should be to make the teachers aware of the importance and possibilities of ICT-the current trends and future projections.
- **Learning theories and technology integration:** Traditional and modern view of learning, shift from teaching to learning, constructivism, role of ICT in lifelong learning.
- **Basic hardware skills :** Hands on experiences 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.
- **Understanding system software:** Features of desktop, starting an application, resizing windows, organizing files (Creating, editing, saving and renaming), switching between programs, copying etc.

- **Using application/productivity software:** Word processing, spreadsheet, database, presentation, publishing, creation of Portable Document Format (PDF) files, test generation, data logging, image processing etc.
- **Using multimedia:** Exposure to multimedia CD ROMs in different subject, installing programs, evaluating CD ROMs, approaches to using CD ROMs, creating multimedia presentations.
- **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 resources, virtual fieldtrips, learning opportunities using the web, and netiquette.
- **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 portfolio and assessment rubrics, creating teacher and student support materials, supporting students with special needs.
- **Introduction to open source software:** Concept, types, advantages, working on open sources application software.
- **Social, legal, ethical and health issues:** 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)
- **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.

2. Making ICT a Priority :

As Carlson (2002) indicates, success in ensuring that teachers acquire the skills and knowledge they need to use technology effectively that will open the door to all kinds of new educational opportunities for both teachers and students, and downstream economic opportunities for graduating youth and their countries. This success is the key to participation in the global knowledge economy. Accordingly, teacher professional development in the use

and application of technology must be given the priority and resources it deserves, while still maintaining a constructively critical eye on its costs and methodologies.

3. Transforming Training and the Curricula:

The fundamental aim is to give the learners the opportunity to become critical thinkers, problem solvers, information literate citizens, knowledge managers and, finally, team members who are proficient in collaborating with others. Meeting this aim requires a fundamental change in how teachers are trained and in curriculum development approaches.

4. Mainstreaming ICTs in all Subjects:

ICTs should be infused into the entire curriculum. Throughout their teacher education experience and professional development programmes, pre- and in-service teachers should learn how to incorporate ICTs into their own subjects. Restricting technology experiences to a single course or a separate area of teacher education will not prepare students to be technology-using teachers. More attention is needed for this integration into the curricula. The focus seems to be on the classic 'Math's, Science, English' package, giving the dangerously wrong impression that ICTs cannot be integrated in all other subjects. The integration itself tends to be focused on technology rather than on information and communication.

5. Making Professional Development as a continuous process in ICT:

A regular in-service training with a special focus on ICT may help them to overcome the resistance and change in mindset along with providing them with the tools and requisite competencies to face the challenges of modern teacher training. The new developments in the field of Information and Communication Technology (ICT), particularly e-learning, are seen to hold tremendous opportunities and possibilities of ensuring Continuous Professional Development (CPD) of the Teacher Educators. Professional development allows them to construct their professional knowledge about pedagogy, content and technology, as well as strategies for managing the changing educational environments brought about by new modes of learning (collaborative learning, e-learning, constructivist learning etc.) and subsequent creation of new kinds of institutional culture.

6. TEI as forerunner of Change:

NCTE, INTEL and various other agencies are doing their bit at their ends by framing curriculum like XPDITTE wherein emphasis is on teaching through ICT. TEI assume a significant role as it provides the opportunity to the teacher educator and the trainee teacher to develop the skills of using the technology in the regular classroom. For this, TEI should provide the required infrastructural facilities which include various hardware and software material related to technology. In other sense, TEI should be equipped with all kinds of modern technologies. This requires a change in the mindset and attitude of institution and the people working in it. TEI should voluntarily collaborate with such kind of technocrat agencies which facilitates his teacher educator and teacher trainees to provide intensive training in the field of ICT. They should be trained in the development of various software packages which would be helpful in the classroom transaction. Technical experts are required in the integration process at three levels- Dialogue to identify the needs from the point of view of teacher educators and student teachers, collaboration to guide the teacher educators on how they can prepare e-learning materials for their effective teaching and to guide student teachers in integrating technology for their own preparation and use of e-learning materials during teaching practice, and Increased technical assistance to teacher educators and student teachers with the increased technology use by faculty and student teachers.

Conclusion

A change agenda “in which the technology is fully integrated into the learning process constitutes a complex pedagogical scenario according to Noss and Pachler where “the teacher’s role will be altered fundamentally”. TPD programmes should not be planned as singular interventions where teachers are simply exposed to opportunities for tinkering with the new technology. Instead, there needs to be a continuous cycle of exploration, reflection, discussion, application, and knowledge building, through which teachers grow professionally and their students gain deeper knowledge, Elmore makes this key observation:

“People can make fundamental transitions by having many opportunities to be exposed to the ideas, to argue them into their own normative belief systems, to practice the behaviors that go with those values, to observe other practicing those values, and, most importantly, to be successful at practicing in the presence of others (that is, to be seen to be successful)...the

most powerful incentives reside in the face-to-face relationships among people in the organization, not in external systems.”

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