TECHNOLOGY PEDAGOGY INTEGRATION IN TEACHER EDUCATION

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ABSTRACT

"Education in general, and post-secondary education in particular, is a predictor of gainful employment in meaningful occupations, opening opportunities for career development, hence for quality of life."

According to Scguri-Geist, & Kundu, 2009

India is the third largest democracy country of the world. In India about 240 million children are disabled and have been denied access to education due to certain barriers outside the institutions and those within. Information and communication technology (ICT) has become one of the basic building blocks of modern society. Understanding ICT and mastering the basic skills and concepts of ICT has now become an important part of education, alongside reading, writing and numeracy. There is a widespread belief that ICTs have an important role to play in changing and modernizing educational system and ways of learning. Embedding ICT in teaching learning processing is a major initiative in teacher education. Thus integrating ICT in pre service teacher education enables the teachers to develop various skills and competences like Media Competence, Competence in dealing productive with plurality, Competence to deal productive with change, Competence to active, conscious and responsible planning , Social Competence (relating with others), Also integrating ICT in in-service teacher education enables the teacher to transform existing practice towards more learner friendly methods and methods suited to strengthening conceptual learning and understanding rather than rote learning, play enhanced roles in the educational system, explore, reflect on and develop one's own practice, deepen one's knowledge of and update oneself about one's academic discipline or other areas of school curriculum. Thus taking ICT as core technology covers both the pre-service and in-service needs and requirement of teachers. Also ICT involves TV, radio, telephony etc. which are useful as resources for providing information. Distance media can be effectively used to keep teachers in touch with other professionals in the field and to give access to professionals in education as well as in pure academic disciplines. This is going a long way in breaking the isolation of teachers while promoting a culture of seeking academic support and collaboration.

Key words : *Inclusive Pedagogy, disability, justice, equality, universal design for learning.*

Introduction

"Education is …….to educate our children to understand the whole of life, to have not the compartmental, divided outlook, to bring out through education a human being who is creative, who is capable, who possesses that intelligence which is total" ***- J. Krishnamurthi***

India is the largest democracy in the world. According to Census 2011, there are 1.2 billion people in the country, out of which, about 833 million people live in rural areas. Census 2011 data on disability has not been announced yet. United Nations observes that 10% of the population has disability and there are about 120 million people with disabilities in India. The challenges and opportunities to provide inclusive education at school level in India.

Information and communication technology (ICT) has become one of the basic building blocks of modern society. Understanding ICT and mastering the basic skills and concepts of ICT has now become an important part of education, alongside reading, writing and numeracy. There is a widespread belief that ICTS have an important role to play in changing

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and modernizing educational system and ways of learning. It is common knowledge that students today are more adept at using the tools necessary for acquiring and transmitting knowledge than are their teachers. Children everywhere are creating their own virtual communities through the use of new technologies. They make use of chat facilities through the use of new technologies. They communicate through the use of new technologies. They make use of chat facilities to stay synchronously in touch with their friends and e-mail and sms to stay in touch with them asynchronously. In many ways they are light years ahead of their parents and teachers with respect of the possibilities of ICT.

Concept of inclusive pedagogy in teacher education

A central task for the IPP was to work with teacher education colleagues who deliver the Professional Graduate Diploma in Education (PGDE), to explore the different ways in which teachers and schools can become more inclusive of children who might have found learning and participation difficult in the past. This collaborative work aimed to develop a shared understanding of inclusive pedagogy, which was built into the programme (Florian, 2012, Florian, Young and Rouse, 2010).

The PGDE is a one year full-time, or two year part-time post-graduate course for both primary and secondary teachers. Successful completion of the course qualifies students to teach in schools, although full registration is only achieved after a probationary year in post. Full time students spend eighteen weeks in the university, and the remaining 24 weeks are spent on placement in two different schools.

The theme of 'Social Justice' places expectations on teachers that they are responsible for the learning of all children; a stance which requires them to conceptualize difficulties in student learning as dilemmas for the teacher, rather than as shortcomings in the pupils. This approach requires that teachers reject notions of inclusive practice that are based on provision for 'most' alongside something different for 'some', but instead it requires.

Inclusive Pedagogy as Derived From Special Education Practice

Snyder (1999) argues that the "inclusion movement has primarily been a special education movement" (p. 175). This is an accurate description with respect to the development of inclusive pedagogy, which has taken much from special education. The process of transferring special education pedagogical practices to inclusive contexts, if we engage in this process at all, must be done thoughtfully and always with the awareness that such practices were nurtured in segregated environments and may themselves serve to perpetuate segregation.

In recognition of this, pedagogies aimed at addressing the needs of all learners that minimize or eliminate the singling out of individuals for special teaching have been developed (see Forlin, Chambers, Loreman, Deppeler, & Sharma, 2013).

The most familiar of these approaches include Universal Design for Learning (UDL) and Differentiated Instruction (DI). However, new approaches continue to be developed that are also worthy of attention, such as Florian and Spratt's (2013) Inclusive Pedagogical Approach in Action (IPAA) framework. What these approaches have in common is their general lack of prescription. The performance expectations of teachers are raised, which in and of itself can be viewed as another positive outcome of inclusive teaching.

Inclusive Pedagogical Approaches

Universal Design for Learning (UDL)is a philosophy of education intended to provide access to learning and success for all students (Sokal & Katz, 2015). The Centre for Applied Special Technology (CAST) model of UDL espoused by Rose, Gravel, and Gordon (2014) is based on three principles that include

- Multiple means of engagement,
- Multiple means of representation,
- Multiple means of action and expression.

Because UDL is principle based it is inherently flexible and adaptable to local classroom contexts and circumstances.

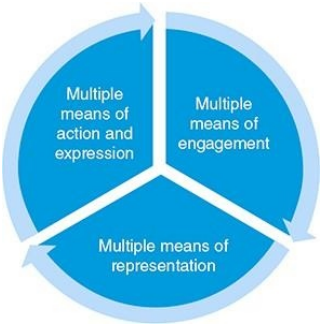

Figure 1: The CAST model of UDL (Rose et al., 2014).

The first principle, multiple means of engagement, advocates the presentation of a variety of ways for students to become involved in the learning. The

facilitation of multiple means of engagement involves discerning student traits and catering instruction to suit the wide variety of interests, abilities, learning styles, etc., that are present in a classroom. This is all done in order to produce purposeful, motivated learners. This principle, therefore, falls very much in the affective and motivational realm of pedagogy, dealing with student motivations, beliefs, self-efficacy, self-expectations, and individual autonomy.

Under this banner, Meyer, Rose, and Gordon (2016) highlight the need to provide students with options for self-regulation, including the promotion of expectations and beliefs that optimize student motivation. Teachers are tasked with facilitating personal coping skills and strategies along with a student's ability to reflect on their own performance and assess their own work. Second, they stress the need for the provision of options that encourage students to sustain effort and persistence. This involves providing very clear goals and objectives, challenging students through increasing demands as their capacities and resources increase, fostering collaboration through group projects, and increasing feedback when mastery-oriented objectives have been met.

The third principle of UDL relates to the provision of multiple means of action and expression (Rose et al., 2014). This is about fostering goal-directed learning that employs strategies best suited to the individual learner.

The UDL model proposed by Rose and colleagues (2014) provides a process under which the needs of a wide variety of learners may be met in a single classroom or learning situation. It is not only for students with disabilities, but rather is applicable to all students, providing for those who are gifted in particular areas equally as well as for those who may still be developing in those areas. At the heart of this model is a process involving promoting personal learning traits, communicating effectively, and providing a variety of options for the completion of goal-directed tasks.

While the Rose and colleagues (2014) CAST UDL model is the most well-known, there are other frameworks that complement and/or re-frame CAST. One of these is Katz's (2012) Three-Block Model of UDL. Katz's model builds on the CAST work, incorporating it into a middle "block" that is bookended by socioemotional learning (Block 1) and systems and structures that support the process (Block 3).

Figure 2: Katz's (2012) 3-block model of UDL

Block 1, Socioemotional learning, involves "... developing schools that are compassionate learning communities in which all students feel safe and valued, and which give them a sense of belonging" (Katz, 2012, p. 23). This is presented as first in the sequence because of its fundamental importance in supporting blocks 2 and 3. It involves helping students to build a strong and positive selfconcept, educating all students (and staff) to value diversity, and engaging in classroom management techniques that are democratic and respectful, such as collective problem solving and increasing student ownership and engagement.

Block 2, Inclusive pedagogy, draws heavily on the CAST model and advocates for the use of multiple means of engagement, representation, and action and expression. Katz recommends the use of backward design (Wiggins & McTighe, 2006) in developinginstructional plans, and the organization of curricula into thematic units that are then sequenced according to a logical framework (for example, conceptually or perhaps seasonally). The use of Bloom's Taxonomy in creating questions for inquiry is recommended in order to "… allow students to take their learning to their best level" (Katz, 2012, p. 72).

Block 3, Systems and structures that support the process, involves examining and changing the "big picture" of how we educate children. This block recognizes the importance of examining and changing school and school systems structures and policies that might lead to exclusion of some children. According to Katz (2012), "Creating inclusive learning communities requires changes to educational policy, budgeting, staffing, training, and interactions with communities—indeed, a major reworking of the whole system".

They also identified some barriers to the

implementation of the approach, which they believed could be overcome with time for collaborative planning, resources, professional learning communities, and education regarding the approach for the school and wider community.

Celebrating diversity lies at the core of inclusive teaching and it enhances the teaching and learning experiences of students as well as teachers. While inclusive teaching relates to all students, it is necessary for students from Indigenous cultures, low socio-economic backgrounds, students with disabilities, students from marginal social and/or cultural backgrounds.

Strategies for Inclusive Teaching

We have categorized the three-fold strategies to cope up with Inclusive Teaching as follows:

1. Collaborative Learning
2. Cooperative Learning
3. Peer Tutoring

Source: Dr. Satveer et. al,journal of Indian Research, Vol 1, No-2, 119-124, April- June,2013 (ISSN No- 2321-4155).

I. Collaborative Learning

Collaboration among teachers is essential and necessary in Inclusive Educational Settings. Collaboration is a style that professionals choose to use in order to accomplish a goal they share. Friend & Bursuck describe how "any activity that teachers work with someone else requires collaboration" Friend and Bursuck further mention that "collaboration is how people work together, not what they do."

Collaborative learning in general is defined as any kind of group learning in which meaningful learning interaction between learners is taken place (Goren-Bar & Koubek, 2001). Collaborative activities can increase student's achievement boost motivation, offer variety and interest, and allow the teacher to differentiate instruction to target students' needs, interests, and aptitudes (Slavin, 1995). Collaborative group learning, however, reflects a much different paradigm of teaching and learning. It is grounded in "constructivism", a psychological and philosophical perspective suggesting that individuals or groups, through their experiences, shape or construct what they learn and understand (Bruning, Schraw, & Ronning, 1995).This study is intended to examine the effect of collaborative learning on learning outcomes of students and differently able students.

II. Cooperative Learning

Cooperative learning is an approach to organize classroom activities into academic and social learning experiences. Cooperative and collaborative learning differs from traditional teaching approaches because students work together in congenial atmosphere rather than competing with each other individually.

Research suggests that cooperative and collaborative learning bring positive results such as positive intergroup relations, greater acceptance of mainstreamed students, and self-esteem. But, the effect has been on other important educational outcomes. These include liking school, development of peer norms in favour of doing well academically, feeling of individual control over the student's own fate in school and cooperativeness and altruism6

Cooperative Learning can be formal, informal and group- based. Brown & Ciuffetelli Parker discuss the 4 basic and essential elements to cooperative learning:

ı Positive Interdependence

Students must fully participate and put forth effort within their group

ı Face-to-Face Interaction

Students explain to one another what they have or are learning and assist one another.

ı Individual Accountability

Each student is accountable for their learning and work

ı Social Skills

These must be taught in order for successful cooperative learning to occur and the skills include effective communication, interpersonal and group skills

Peer Tutoring

A peer tutor is someone who is of a similar status as the person being tutored. In peer tutoring, both the tutor and the tutee are form the same grade and the

peer tutor helps the peer tutee. There are many benefit from both the peer tutor and tutee in this relationship. The peer tutor can establish a rapport with the tutee in a way that a teacher cannot. A peer tutor is not bound to give any grade on the paper, whereas a teacher serving in a tutor role may still be perceived as someone who grades papers. This brings in a non-hierarchic atmosphere for the tutor and the tutee.

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There are various advantages of Peer Tutoring to school children. The student who provides the tutoring remembers and revises the learned material. Similarly, tutee student also learns fast as the student can discuss in non-intimidating atmosphere. Peer tutoring helps nurture new friendships. It has been observed that students involved in peer tutoring behave better in the classroom and show more engagement throughout the learning process.

Peer tutoring in the classroom:

Peer tutoring is an organized learning experience in which one student serves as the teacher or tutor, and one is the learner or tutee. It gives students an opportunity to use their knowledge in a meaningful, social experience (Conrad, 1974). Peer tutoring is the process between two or more students in a group where one of the students acts as a tutor for the other group-mate(s). Peer tutoring can be applied among students of the same age or students belonging to different age groups. Encouragement of peer tutoring is a useful strategy that can be applied effectively by teachers in many cases in both mono-grade and multigrid schools.

It is useful to define two types of peer tutoring, (a) incidental and (b) structured peer tutoring. Incidental peer tutoring often takes place, either at school or while students are playing after school or when they are socializing.

Multi-Level Teaching

As an administrator (principal) it is imperative that you support your educators in the classroom. Understanding and supporting multi-level instruction is a great way of accomplishing this. Multi-level instruction is the process of teaching one primary objective or concept to the class while allowing for varying outcomes for an individual student or a small group of students. The Students with mild to severe disabilities are being included in general education classes with increasing frequency and success. However, teaching children with substantial differences in academic abilities together in one classroom still requires that we (educators) learn a great deal. In this sub unit, we describe the typical strategies that schools and teachers who are seeking to be inclusive schools use in coping with substantial differences of ability among their students and suggest that, foremost, we need ways of thinking and talking about inclusive teaching, approaches to teaching children together in tasks where students can learn at their own level, heterogeneously grouped.

Some of the multi-level teaching strategies include:

- Conduct individual reading, writing, and spelling conferences during workshop time. This keeps the teacher focused on what students are learning, helps group children for mini lessons on specific skills, and allows time for notetaking about students' progress, strategies, and interests (Graves, 1994; Tomlinson, 1999; Zemelman, Daniels, & Hyde, 1998).
- Have children keep journals in which they record their thinking about books and school topics. Use this writing to facilitate discussion groups. This provides insight into their learning and helps them think about what they are reading.
- Give homework projects related to what the children are learning and that can be done at multiple levels. For example, students may interview a parent about their childhood and write a report about it to share in class.
- Foster a community where children are expected to help each other. They begin to understand that in a real community they both increase their own skills and encourage everyone to do well.
- Group students in many different ways for lessons so that they do not know when you are grouping by ability (topics, count off, particular skill, guided reading group).
- Group heterogeneously most of the time.

Using Co-Curricular Activities for Facilitating Learning

Co-curricular activities facilitate in the development of various domains of mind and personality such as intellectual development, emotional development, social development, moral

development and aesthetic development. It also facilitate in Creativity, Enthusiasm, and Energetic domain. Co-curricular activities are defined as the activities that enable to supplement and complement the curricular or main syllabi activities. These are the very important part and parcel of educational institutions to develop the students' personality as well as to strengthen the classroom learning.

Co-curricular activities are the true and practical experiences received by students. To a greater extent, the theoretical knowledge gets strengthened when a relevant co-curricular activity is organized related to the content taught in the classroom.

Role of a Teacher in organising curricular Activities:

a. He teacher must be a good planner so that the different activities could be carried out systematically throughout the year.

b. It should be the duty of the teacher to give more and more opportunity to the child while performing co-curricular activities.

c. Teacher should act as Innovator by introducing some innovative programmes.

d. The teacher must be a good organiser so that the students experienced maximum of it.

e. He/she should too act like as director, recorder, evaluator, manager, decision maker, advisor, motivator, communicator, coordinator, so that the student and child could gained maximum of finer aspects of Co-curricular activities.

It is usually observed that many teachers have been unable to find effective ways to use technology in their classrooms or any other aspect of their teaching and learning life. The possible explanation for this backwardness among teachers is that the use of technology in the classroom has not been encouraged and teachers are not well trained in using ICTs.

In recent times the integration to ICT in teacher training has been the topic of much debate because education systems around the world are under pressure to use ICTs to impart knowledge and skills students need in 21 century. Teacher education institutions are faced with the challenges of preparing a new generation of teachers to effectively use the new learning tools in their teaching practices. NPE 1986 maintained that preservice and in-service teacher education are inseparable for the development of teacher education because teacher education is generally considered to be essential for school effectiveness and improvement.

ICT is not only an essential tool for teachers in daily work but it also offers them opportunities for their professional development. Hence in order to introduce and understand the need of ICT in educational institutions, the teacher or students undergoing teacher education programme must first comprehend and be at ease with ICT. Teachers must learn to teach with digital technologies effectively as educational tools. He/she must master the use of information-skill of research, critical analysis, linking diverse type and resources of information, reformulating retrieved date, if he/she is to teach his/her pupils to develop these skills. So the most obvious technique for professional development for teachers is to provide courses in basic ICT knowledge and skills.

UNESCO has projected a holistic frame-work taking into consideration four supportive themes viz. Context and culture, leardeship and vision, lifelong learning and planning and management of change. Context and culture identifies with the culture and other contextual factors that must be considered in infusing technology into the teacher education curriculum. It includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modelled by teachers. Leadership and vision are essential for the successful planning and implementation of technology into teacher education and require both leadership and support from the administration of the teacher education institutions. Lifelong learning acknowledges that learning does not stop after school. Planning and management of change signifies the importanceof careful planning and effective management of the change process.

Also balancing ICTs into teaching and learning requires balancing different sets of knowledge and skills. It involves technological content knowledge. Thus ICT in teaching in not merely developing ICT skills and competencies; rather It involves developing in the students and teachers the ability to continuously develop themselves, to ascertain the kind of ICT suitable for learning experience to be provided, and to use ICT to optimize the process of education. This can be divided into four stages:

- Discovering ICT tools - In this discovery stage, there is usually emphasis on ICT literacy and basic skills.
- Learning how to use ICT tools - This stage involves the use of general or particular application of ICT.
- Understanding how and when to use ICT tools- This stage implies the ability to recognize situation

where ICT will be helpful, choosing the most appropriate tools for a particular task and using these tools in combination to solve real problems.

➢ Specializing in the use of ICT tools- At this stage, ICT becomes an integral thought invisible part of daily personal productivity and professional practice.

But inadequate teacher expertise is the bottleneck in the application of ICT in education. Thus, in order to develop competence among teachers, ICT must be taken as a core technology in teaching training setting. A core technology refers to the main way of organizing the learning experience; the component around which all other components are planned. ICT use in the classroom as the content focus of the teacher training refers to helping teachers gain competence with ICT, for example with application, specific educational software packages and the internet.

ICT use as core technology for participation refers to the tool used to support flexible learning for teachers and particularly for school-based or home-based study for teachers, mentoring new teachers, and interregional or international collaboration. The on-line learning networks for teachers provided in many parts of the world are examples of teacher learning via ICT as a core technology.

Major changes can be accelerated both in pre service teacher training as well as in in-service teacher professional development through ICT. It is need of the hour that all parties within the education industry from foundation to post-graduate - must work together with institutions of teacher education to make pre-service training for teachers, modern and international. All institutions involved in preparing educators, should provide technology-supported learning experiences that promote and enable the use of technology to improve learning, assessment and instructional practices. This will require teacher educators to draw from advances in learning science and technology to change what and how they teach. Teacher must learn to use technology not for their own use but to research, collaborate, prepare lesson plans, and do the administrative work in the classroom.

Embedding ICT in teaching learning processing is a major initiative in teacher education. Scientific, technological, cultural and innovations are taking place at such breath-taking pace that teachers constantly need revise their skills in order to adapt to the changing circumstances. E-learning courses at the forefront of pedagogy employee a wide range of active and interactive approach to meet this requirement. E- learning, M- learning blended learning, virtual education etc enable both in service and perspective teachers to develop the ability to find, manipulate, analyze synthesize and re-purpose information. Integration of ICT in teacher training program helps the teacher in developing proper thought and insight to use the ICT tools effectively.

As a result of ICT training, teachers can practice newly developed skills in teaching. Now a days ICT is used as a searching tool resources. Perspective teachers make use of ICT to prepare their lessons and to search for additional source on the internet. With specific software, teaching learning can be enhanced with graphics interactions, animations and visualization. PowerPoint presentation helps the teachers in making their lessons more interesting. The use of peripheral devices (interactive boards, projects) on computer also aids the teaching learning process. ICT also help in speeding up the delivery of support services. Through wireless and satellite system, teleconferencing, web based conferencing etc., teaching strategies and resources can be shared with other educators. Thus integration of ICT in, both in-service preservice teacher education leads to fair use of e-resources which in turn facilitates the formal, distance and lifelong learning teacher.

Thus integrating ICT in pre service teacher education enables the teachers to develop various skills and competences like:

- Media Competence
- Competence in dealing productive with plurality
- Competence to deal productive with change
- Competence to active, conscious and responsible planning
- Social Competence (relating with others)
- Communication competence
- Competence for collaboration
- Information competence
- Competence in knowledge management
- Electronic access to online database

Also integrating ICT in in-service teacher education enables the teacher to:

- Transform existing practice towards more learner friendly methods and methods suited to strengthening conceptual learning and understanding rather than rote learning.
- Play enhanced roles in the educational system
- Explore, reflect on and develop one's own practice.
- Deepen one's knowledge of and update oneself about one's academic discipline or other areas of school curriculum.
- Research and reflect on learners and their

education

- Understand and update one on educational and social issues.
- Break out of intellectual isolation and share experience and insight with others in the field
- Prepare for other roles professionally linked to education/teaching.
- Implement and achieve specific targeted aspects in the curriculum
- Facilitates the educational transaction by keeping in contact with students through e-mail, chat session, etc., encouraging active learning, sharing ideas, providing immediate feedback, encouraging paced learning and allowing for effective mapping for learning pathways.
- To develop or improve lesson plans, exchange ideas, obtain information and find free animation and simulation to enliven their lessons.

Thus taking ICT as core technology covers both the pre-service and in-service needs and requirement of teachers. Also ICT involves TV, radio, telephony etc which are useful as resources for providing information. Distance media can be effectively used to keep teachers in touch with other professionals in the field and to give access to professionals in education as well as in pure academic disciplines. This is going a long way in breaking the isolation of teachers while promoting a culture of seeking academic support and collaboration.

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