

“Technology Integrated Teaching Learning Experience”

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Workplaces are witnessing a significant change brought by the web, wireless communication and distributed work, which Casonato & Morello (2002) observe “(have) introduced discontinuity in where and how people work, how their performance is measured, and how their objectives are set (" where ") assignments, work settings, peers, employers and work choices are increasingly changeable and fluid." The employer-centered workplace of predefined jobs and career paths has given way to a worker-designed environment where individuals pursue their own assignments and must effortlessly combine technical skills with an intellectual toolbox enriched with experiences, roles, team building, and knowledge (Casonato & Morello, 2002; Morello, 2003). As a result, a widening gap has formed between the knowledge and skills students are acquiring in schools and the knowledge and skills needed to succeed in the increasingly global, technology infused 21st century workplace (Partnership for 21st Century Skills, 2005b).

The response of education to technology has been varied and the search for the most effective way is still on. Pierson (1999) and Woodbridge (1999) and Johnson and Liu (2000) have suggested various models of technology integration in teaching learning process. Pierson (1999) defined technology integration as teachers utilizing content and technological and pedagogical expertise effectively for the benefit of students' learning. The model suggested by UNESCO (2003) lays the foundation for the different levels of judicious integration of technology.

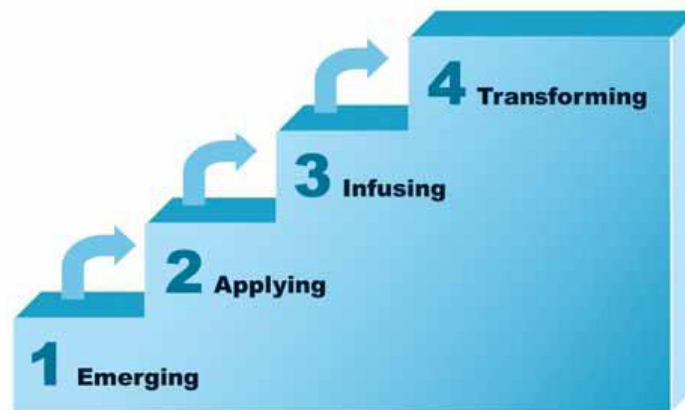


Figure : *Stages of ICT development that educational systems and schools pass through in the use and adoption of ICT*

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*(Source: Building Capacity of Teachers/Facilitators in Technology-Pedagogy Integration for Improved Teaching and Learning, UNESCO Implemented Project on Training and Professional Development of Teachers/Facilitators in the Effective Use of ICTs for Improved Teaching and Learning Supported by Japanese Funds-in-Trust Programmes
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After a study of various models and steps the researchers have proposed the following model for the concept of judicious integration of technology. This model is essentially based in the constructivist paradigm.

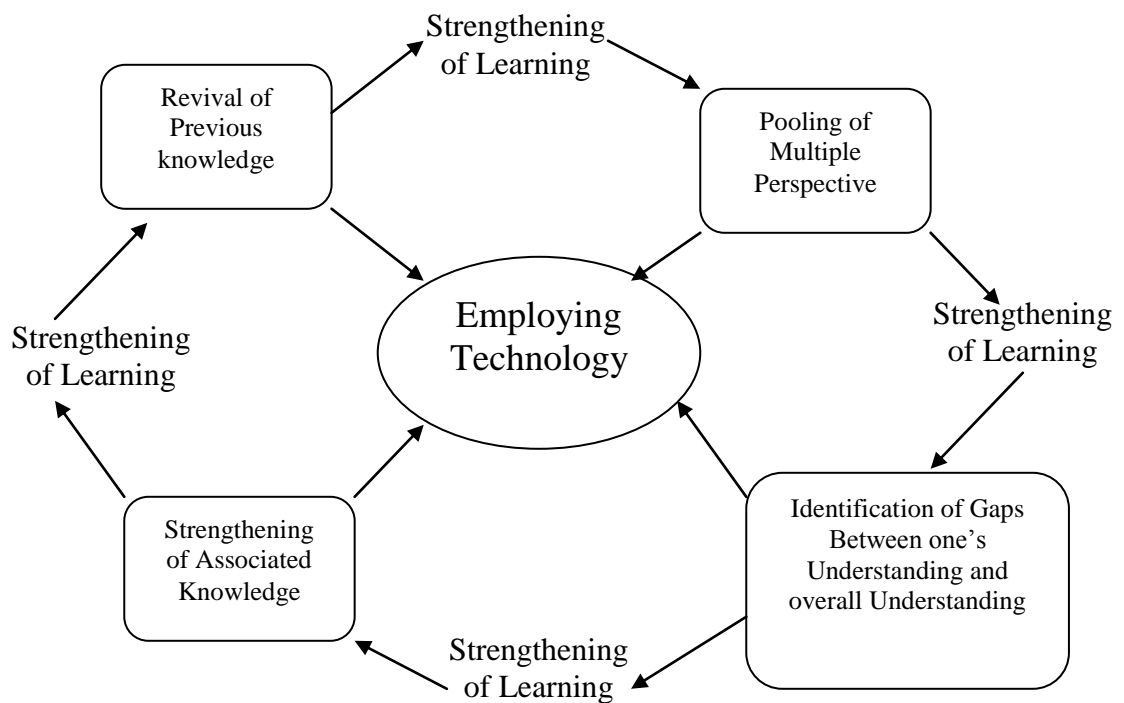


Figure : Knowledge construction cycles

The model proposed by the researchers for understanding the concept of judicious integration of technology (CJIT)

Knowledge Construction Cycles :

This model comprises various knowledge construction cycles. Revival of previous knowledge, strengthening of associated knowledge, interpretation of the learning experiences, strengthening of learning, pooling in of multiple perspectives, strengthening of learning, identification of gaps between one's understanding and the overall understanding, strengthening of learning at all the stages technology can be integrated in the teaching learning process.

Judicious integration of technology demands attempt at two levels: knowledge level in which the understanding of judicious integration of technology is aimed at and secondly at the practice level which requires empowerment of teachers. The empowerment of teachers needs to be attempted at three levels: to understand the shift from behaviorist paradigm to constructivist paradigm, awareness and accessibility to new techno-pedagogical tools and finally practice of the given techno-pedagogical tools in the constructivist paradigm.

Overview Of The Models Of Teacher Development and Review of Related Literature:

Lessons for professional development of teachers who are to be empowered to integrate technology judiciously in teaching learning process are:

1. Base professional development program on constructivist approach
2. Focus on reflections
3. Collaborative effort
4. Practical work and hands on experience
5. Self learning
6. Real life context.

Based on the above professional development program was designed.

Rationale:

The contemporary society is marked by technology aided knowledge explosion. A key characteristic of such society is that the knowledge transmission is also aided by technology, thereby making technology an integral part of education. Technology is here to stay and grow; 21st century skills also demand development of techno skills in the students. In view of the contemporary context and the future in which there is an overwhelming influence of technology, teacher development programs need to give due consideration to technology and judicious integration of technology in teaching learning process both at pre and in service level.

Taking cognizance of the situation several initiatives at the government and at institutional level are taken to promote technology with teaching and learning process. The challenge for integration of technology with education may be viewed at two levels: viz. the provision of infrastructure and the judicious integration of technology with education. The second challenge, if viewed at the school level, addresses the concern of judicious integration of technology with teaching.

Baroda city is developing fast and the schools have realized the value of technology based education. Most of the schools have well equipped computer laboratory and own educational software. The city has a few institutions of Teacher Education: Centre of Advanced Study in Education, a premier institution in the field of teacher Education, Navrachana College of Education and a few other. The syllabus of these institutions have a component on integration of technology with education. Therefore, initiative in the area of exploring and disseminating the knowledge base and skills for technology integration with education have been made. It is important to take a review of the situation and identify the newer challenges that the teachers might be facing in the

area of implementation of technology integrated teaching at the ground level. This is necessary to re strengthen the skills of the teachers.

Research Questions:

Research questions raised in this context are as follows,

- What is the nature of knowledge base for integrating technology with teaching?
- Are the teachers equipped with the knowledge and skills to integrate technology with teaching?
- How are the teachers equipped with the knowledge and skills to integrate technology with teaching?
- What is the nature of challenges teachers face in integrating technology with teaching?
- How can the teachers be equipped to overcome the challenges that the teachers face in integrating technology with teaching?

A study was planned to answer some of the questions raised. The title of the study was: **“Professional Development Programme (PDP) for Teachers for Technology Integrated Teaching”**

Objectives Of The Study:

1. *To asses the needs of the teacher with respect to techno-pedagogy*
2. *To develop the professional development program (refresher course)*
3. *To validate the effectiveness of the refresher course*

Design Of The Study:

It was a developmental study. A refresher course was developed as a part of the study. It was implemented on a group of people to validate it and to determine its effectiveness.

Delimitation of the study:

The study is delimited to the school teachers who have some basic training in computers.

Methodology:

Developmental study to develop professional development program followed the following phases;

Phase 1 Need assessment from school teachers using focus group discussion.

Phase 2 Need assessment from experts in the field of education using focus group discussion.

Phase 3 Identification of the course components for the professional development of the training program in terms of theoretical input and technology focus. Further classification of the course components as a part of transaction and as literature for further reference.

Phase 4 Developing the professional development program; formulation of objectives, mode of transaction and developing guidelines for transaction.

Phase 5 Getting expert advice on the professional development program. This was done at two levels. Level one was at the faculty level of the college and modifications. The modified version was presented to external experts and modified as per the suggestions.

Phase 6 Pilot study for validating the professional development program and modification.

Phase 7 The program thus developed was implemented on a different set of teachers from different schools for effectiveness and validation.

Sample: For the sample school teachers involved in integration of technology at school level were selected. For focused group discussion twenty two teachers from different schools were selected for the focus group discussion in two rounds. For implementing the program former students of Navrachana College were selected as the sample. For further validating it and studying its effectiveness it was implemented on totally different set of school teachers.

Findings From The Focus Group Discussion

Perceptions of Teachers about integration of technology in teaching

As many the number of teachers, so many are the perceptions about the integration of technology in teaching. The different impressions that the teachers carry about integration of technology are:

- Technology helps in teaching in real life situations thereby replacing rote memorization and allowing students to explore new things by self-experience.
- Technology enhances learning; it helps teaching in an effective way. The child is able to understand the core concept if a topic is taught step by step with the help of technology.
- Technology keeps both teachers and students updated.
- Technology increases competitiveness in teachers as well as students.
- It helps in fostering curiosity and develops creativity in children.
- It not only makes learning interesting but helps retain it for life.
- Technology helps teachers to constantly remain in touch with their students.
- It helps in inter-disciplinary learning also. Large number of students can be taught at a time more effectively and in less time.
- Increases/ develops/ enhances the skills of cooperation and coordination among both- teachers and students.
- It helps in developing higher order thinking skills.
- It also helps in respecting and accepting the other's view/response/opinion.

Module for Integration of Technology in the Teaching Learning Process

It consists of 5 session (each of two hours)

Session I : Judicious Integration of Technology

Time – 2 hours

Expected Learning outcomes

- be able to decide when to use technology
- be able to decide which technology to use
- be able to decide why technology is to be used

Mode of transaction:

- Discussion on integration of technology in the sample presented.
- Consolidation of the concept of judicious integration of technology
- Trainees to critique lesson plans/ samples / implemented in their schools.
- Develop a lesson plan (outline) based on judicious integration of technology in teaching learning process.

Assignment:
Critique the lesson plans implemented in their schools

Session II : Twenty First Century Skills

Time – 2 hours

Expected Learning Outcomes

Be able to understand the twenty first century skills

Be able to identify ways of developing twenty first century skills using technology

Mode of Transaction

- Discussion on current school practices for developing twenty first century skills.
- Fish Bowl technique to be used. The first round will have discussion on current teaching learning practices. The second round will have discussion on what type of adaptations are needed to prepare students for the 21st century skills.
- Presentation of ideas on integration of subject, technology and 21st century skills after small group discussion. Participants will be grouped in small groups of five based on same subject groups. Chits with different technological gadgets and 21st century skills will be kept in two bowls. A member from each group will choose a topic / content area and use technology to inculcate twenty first century skills for any three identifies twenty first century skills.
- Technology focus (focus on internet browsing, connecting video clips, scanning)

Overview by educator

Some techniques that we have learned and practiced today are

- Collaborative learning
- Small group discussion
- Team work
- Fish bowl technique
- How and where will you use these techniques in the subjects that you teach in school?

Session III : Blooms Taxonomy (Revised), Higher order thinking skills & Assessment

Time – 2 hours

Expected Learning outcomes.

Be able to understand the higher order thinking skills

Be able to identify the use of technology for developing higher order thinking skills.

Be able to understand the concept of product assessment and process assessment

Mode of transaction:

Choose a topic and develop a Power point presentation on it for a particular standard

Show case the presentation.

Discussion on product assessment.

Discussion on the reflective log with reference to process assessment.

**Session IV : Individual Differences
(Gifted, slow learners, multiple intelligence)**

Time – 2 hours

Expected Learning Outcomes

- Will be able to understand the need to address the individual differences in a class
- Will be able to identify and plan use of technology to meet the individual differences

Mode of transaction

- Reading of literature on differentiated instruction
- Presentation by educator on multiple intelligence and instructional tools
- Developing learning resource material for different learners based on three multiple intelligence and for advanced and average learners
- Self check on technology proficiency (a self check on technology proficiency to be filled in)
- Helping trainees to learn what they don't know with the help of 'help' option.
- PLM for slow and for advanced
- Tests for slow and advanced

**Session V : Constructivism
(Peer tutoring, group learning, co-operative learning, collaborative learning)**

Time – 2 hours

Expected Learning Outcomes

- Be able to understand the practice of constructivism
- Be able to implement self learning, group learning with the help of technology

Mode of transaction

- Use mind mapping software for learning a concept in small groups (the trainees select topics from the list) .

Technology focus

- Use of free software, constructivism, active learning/ collaborative/ cooperative learning.

Guidelines

- Workshop will be for ex-navrachnites (nce)
- It should have less of theory and more of activity
- Evaluation inputs should be given as indirect component through activity
- Similarly the inputs related to the administrative inputs should also be provided indirectly
- Any theory which is understood as important and necessary can be given in the area of further reading.
- Also supplementary reading and references should be given.
- The mode is activity oriented.
- Reflective log is to be made by the participants for every session.

Pilot Study Analysis: Reflections Of Researchers

In order to get a comprehensive picture of the pilot study and the modifications that need to be made feedback received from different sources- participant trainees, educators and reflection of researchers was analyzed.

I Duration

Five day duration is appropriate two and half hours each is appropriate

Initially the design was for two hours but later in implementing it was found that it generally extended to two and a half hours which was also comfortable for participant/ trainees.

II. Components

Theory plus practical

- i The theoretical input was transacted in much lesser time and fast than planned
- ii. The need for evolving design for the technology input was felt. The steps taken during implementation for this were daily need assessment from participant trainees was from participant trainees was collected every day. The specific areas needing competency building were to be taken up the next day and this differed for each individual and the group.

III. Judicious integration of technology, why, how and what.

It was observed that the teachers experiences in school and their understanding of judicious integration of technology in teaching learning process largely remains at type I technology only.

But through this program an awareness for type II technology can be created. Which the teachers can implement in schools as per local conditions and contexts.

Thus the success of program is dependent on the above.

IV. Content

The component on 21st century skills also could not be taken up well by the participants as they felt that their task was to complete the syllabus and so very little time was left for skill development

The above feedback received from the three different sources did not indicate a need for any major change in the PDP developed. A positive response for the PDP could be observed in the following specific observations:

- *Enthusiasm level of participant trainees was high*
- *Though the participant trainees attended workshop after working in morning school, fatigue and disinterest was not observed.*
- *Willingness to learn was evident.*

Findings of Phase 7: The teachers were very happy to learn the type II technology and its usage for school children. They were also happy to learn many new and simple things offered in the program. They were appreciative about the PDP (professional development program) and the way it was transacted. The researchers observations

also revealed the teachers excitement and enthusiasm in the tasks given to them. The teachers came after the hectic school schedule still they actively participated in all the activities assigned to them by the resource persons.

Overview

The design for the teacher development in the area of integration of technology in the teaching learning process was detailed for minute by minute implementation and transaction, it possessed flexibility in design. It was flexible enough and open to incorporate any immediate and contextual need that could be felt by the educator or demanded by the participant trainee.

On a regular basis feedback was collected from the participant trainees and also difficulties faced by them were collected so as to incorporate the newer dimensions on the next day. Thus the design was flexible and need based at the same time it was evolving in nature. At the base the design was a constructivist approach collaborative learning designs and focus on the core issues in the area of technology integration in teaching and learning. The highlight of the program was a shift from Type I technology (full technology) to Type II technology (empty technology), differentiated instruction, multiple intelligence, twenty-first century skills employing technology integration, formative and summative assessment to evaluate the techno-pedagogic construction, constructivism, mind mapping and other software and its usage.

The researchers, however, do not rule out any contextual changes that may be needed when it is implemented on a larger scale. It also needs to be considered that the participant trainees were the former students of Navrachana College of Education, Baroda. These participant trainees did possess a comparatively comfortable and similar exposure to technology in education.

REFERENCES

- 1 Casonato, R. & Morello, D. (2002, July) The deployee: At the forefront of workforce transformation. Research note. Stamford,CT: Gartner Research
- 2 Jonassen, D. H. (1996). *Computers in the Classroom: Mindtools for Critical Thinking*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- 3 Zucchermaglia, C. (1991, May). Toward a cognitive ergonomics of educational technology. Paper presented at the NATO Advanced Research Workshop on the Design of Constructivist Learning Environments, Leuven, Belgium.
- 4 Pierson, M. (1999). *Technology practice as a function of pedagogical expertise*. (Doctoral dissertation, Arizona State University, 1999). UMI Dissertation Service, 9924200
- 5 Pierson, M. (2001). *Technology practice as a function of pedagogical expertise*. *Journal of Research on Computing on Education*, 33(4), 413-430.
- 6 Diaz-Maggioli, G. (2004). *A passion for learning: Teacher-centered professional development*. Alexandria, VA: Association for Supervision and Curriculum Development.
- 7 Sparks, D. (2002). *Designing powerful staff development for teachers and principals*. Oxford, OH: National Staff Development Council.

- 8 Darling-Hammond, L. (1998). Teacher learning that supports student learning. *Educational Leadership*, 55(5), 6 – 11.
- 9 Kelley, L., & Ringstaff, C. (2002). *The learning return on our educational technology investment: A review of findings from research*. San Francisco: West Ed.
10. Delors, J 1996. *Learning: The treasure within*. Report to UNESCO of the International commission of education for the twenty-first century. Paris: UNESCO Publishing.
11. Partnership for 21st Century Skills. (2005b). *Road to 21st century learning: A policymakers' guide to 21st century skills*. Washington, D.C.: Author. Available: http://www.21stcenturyskills.org/images/stories/otherdocs/P21_Policy_Paper.pdf
12. McClintock, R. *Power and Pedagogy: Transforming Education through Information Technology*, Institute of Learning Technologies, New York, 1992.
13. Kanaya, T., Light, D., & Culp, K. M. (2005). Factors influencing outcomes from a technology-focused professional development program. *Journal of Research on Technology in Education*, 37(3), 313--329.
<http://portal.acm.org/citation.cfm?id=1150034.1150059&coll=&dl=ACM&type=series&idx=SERIES11362&part=series&WantType=Proceedings&title=ICLS>
14. Huberman, M. A. (1989). The professional life cycle of teachers. *Teachers College Record*, 91(1), 31-57.
15. Pontz, B. (2003) *Beyond rhetoric: Adult learning policies and practices*. Paris: Organization for Economic and Cooperative Development.
16. Wallace, M. 1991. *Training Foreign Language Teachers: A reflective approach*. Cambridge: CUP.
17. Woodbridge, J. (2003), *Technology Integration as a Teaching Strategy*, Dissertation, Minneapolis, MN : Walden University
18. Johnson, D. L., & Liu, L. (2000), First step toward a statically generated information technology integration model, *computers in the schools*, 16(2), 3-12.
19. Ur, P. (1997). The English teacher as professional. *English Teaching Professional* 1(2), 3-5.

WEBSITES

1. <http://www.ilt.columbia.edu/publications/Projects/digitexts/mcclintock/title.pdf>
2. <http://www.sedl.org/pubs/tec26/resources.html>
3. <http://www.marcprensky.com/writing/Prensky%20%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>
5. http://www.iste.org/Content/NavigationMenu/Research/NECC_Research_Paper_Archives/NECC_2004/Woodbridge-Jerry-NECC04.pdf
6. <http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te800.htm> (Benton, 2002; CEO Forum, 1999, 2000)
1. <http://www.techlearning.com/story/ShowArticle.php?articleID=17701367>
2. <http://jalt-publications.org/tlt/files/97/oct/ur.html>
3. <http://www.innovateonline.info/extra.php?id=733>
(http://www.editlib.org/index.cfm?fuseaction=Reader.ViewAbstract&paper_id=26105)