A Constructivist Model of Teacher Training for e Learning in Knowledge Based Connected Society:
I-CONSENT Initiative

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Abstract

This paper presents Tech-MODE teacher education program developed at I-CONSENT, India, to prepare teachers for e learning, using situated learning design and constructivist pedagogy. It is designed, developed, delivered, and supported by a group of thirty five educators from eight institutions/universities on the ePASS as an OFDL program with the support of COL for QE4A. A critic of the model is given, in the context of pedagogical principles, developmental objectives, innovative strategies and the experiences gained and insights developed during pilot run of the program for two years.

I-CONSENT

Indian Consortium for Educational Transformation **(I-CONSENT),** a non govt. nonprofit organization, was established in 2005, as a platform to work collectively for educational transformation-through Technology Mediated Open and Distance Education (Tech-MODE), for development through "quality education for all (QE4A)", with the initiative of Ram Takwale, former Vice-Chancellor of IGNOU, Mohan Menon, Education Specialist; Commonwealth of Learning (COL), Martand Deshmukh, Senior Education Consultant from Mumbai, and about 50 education experts from various institutions like six state universities, the state open university-YCMOU; Non-Governmental Organizations (NGOs) like Indian Institute of Education (IIE), Homi Bhabha Center for Science Education (HBCSE):Tata Institute of Fundamental Research (TIFR); Corporate Bodies like Maharashtra Knowledge Corporation Ltd. (MKCL) ; State organizations like

Marathi Vidnyan Parishad; and experts from the national agencies like NAAC, NCTE etc, sharing common concerns about Indian education and came out with a co-operative, collaborative and consortium approach to educational issues like QE4A.

With the strong belief that teacher is pivotal to any change in the field of education, one of the initial thrust areas for I-CONSENT activities was teacher education and the first program was development of on line, Tech-MODE degree course to prepare teachers for e learning viz. B.Ed. (e Education) i.e. Bachelor of Education - e Education, with an innovative constructivist pedagogical model.

Commonwealth of Learning (COL) appreciated the concept of this consortium and supported the programs for educational transformation, initiated by I-CONSENT.

Social and Educational Transformation

The world is fast transforming in to a large global connected community with ever-increasing impact of information and communication technology (ICT). Education, as an accepted tool of social change and reconstruction, is in the center of this accelerated process of social and cultural change. It's a total transformation with new life styles, new learning needs and processes, new skills and newer educational practices to imbibe those skills - relevant and useful to the Net Gen.

This has changed the whole perspective of education. This has entrusted the role of information seeker and knowledge creator to the learner. Seeking information and learning to use various resources to generate new knowledge and use it productively, has become a goal for the learner. Transmitting knowledge is no more a valid objective for a teacher. Teacher's role in these processes is also changed from a dominating controlling authority to a facilitating support and a reliable partner in learning. Learners' autonomy is of prime importance. It is the learner who decides what, when, and how of learning.

Issue of QE4A

In India, despite the committed policies and all out efforts of the subsequent governments for more than half a century of independence, the cherished goal of providing quality education for all and achieving 100 % literacy in Indian continent, remained elusive, mainly due to problem of large numbers. Huge population, limited resources, low literacy rate with a great disparity in literacy across the states, male-female, rural-urban divides during last 60 years, made the issue of "education for all", more complex and complicated.

It is the teachers who will have to realize this goal. But is the huge contingent of our teachers, trained in and armed with only conventional teaching techniques, capable of facing the challenges of technology? It's a problem of number-a very large number. Training and re-training of such a large number of teachers, is a Herculean task at any given time. In addition, their periodic re-training to enable them to face the challenges of fast changing new emerging society, successfully, in any meaningful time frame, is practically impossible. The present and forthcoming challenges of teacher education necessitate the development of the ICT based teacher education program.

Table 1.
Number game of schooling in India [1]*

Level of Schooling	No. of schools	No. of Students	No of Teachers
Primary	748547	135316946	2100462
Upper Primary	447600	62056450	1887343
Secondary	128370	31779027	1244515

*2010-11 figures

This was the rationale that prompted us to develop Bachelor of e-Education degree program.

B.ED. (e-Education) program: Context and Goals

This program is designed as a new paradigm program suitable for a connected society in which learning-working–developing is integrated. It demonstrates how constructivist pedagogy and situated learning designs can best be used to empower teachers to manage the development centric educational system and achieve developmental objectives through e-learning. It also shows the why, what and how of a consortium approach in large scale training programs of professionals in developing countries. It can be seen from the program, how available technologies can be used to find out various ways to provide a continuous support to the teachers in the making.

Goals:

The goals of the B Ed. (e-Education) programs are:

1. To develop L3 (Life-Long-Learning) teaching community for e-learning in a connected society.
2. To enable teachers to become reflective professionals with development of their competencies, capabilities and skills that enable them to play multiple roles in teaching, learning, working, developing and transforming together.

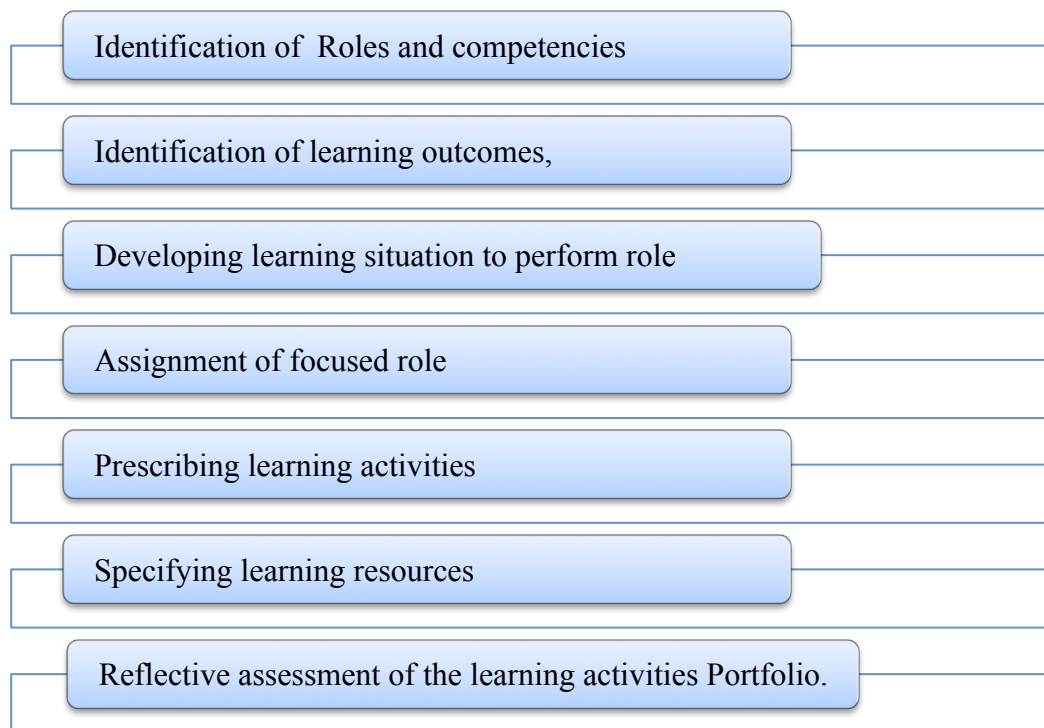**The specific objectives of the e B.Ed. program are:**

1. To prepare teachers as reflective practitioners for technology enhanced learning and to play various roles in futuristic networked learning environment.
2. To promote innovativeness, creativity, and leadership qualities in teachers in the context of e-education and enable them to cultivate these qualities amongst students.
3. To develop collaborative-cooperative learning skills in teachers
4. To enable teachers to identify and use community resources as educational inputs for learning and developing.
5. To enable professional teachers to undertake action research and to use and adopt innovative practices for development.

Constructivist Model

In India, constructivist pedagogy is accepted for framing the latest National Curriculum Framework (NCF, 2005) and accordingly, the nationwide school curriculum is restructured, text books written and annual examination is replaced by the continuous comprehensive evaluation (CCE). Therefore, this program is based on the basic tenets of constructivist pedagogy like learner centered activity based courses, competency based rather than knowledge based objectives, contextual learning through situated learning design, scaffolding, learning activities and self study, reflective thinking, cooperative learning and collaborative working, and other pedagogical principles such as role based performance for problem solving , concept based rather than content based courses and online networked learning.

Courses with developmental objectives and socially useful productive work (SUPW) for self and community development, as well as, integrated continuous comprehensive evaluation (CCE) with portfolio assessment without course end examination, is a special feature of the program.

Figure No. 1

Identification of Roles and competencies

Identification of learning outcomes,

Developing learning situation to perform role

Assignment of focused role

Prescribing learning activities

Specifying learning resources

Reflective assessment of the learning activities Portfolio.

Scenario Based Learning

This program is based on the "future scenario based situated learning and situated development" model [2].The situates in this program are the classroom, school and community around the school. Study of the learner is based on the scaffolds provided in the

scenario and tasks assigned - various activities and assignments to be completed for promoting competencies and capabilities required for him / her to play various roles a teacher has to carry out. The courses are linked with various settings of technology access found in different schools, with excellent to poor facilities of ICT
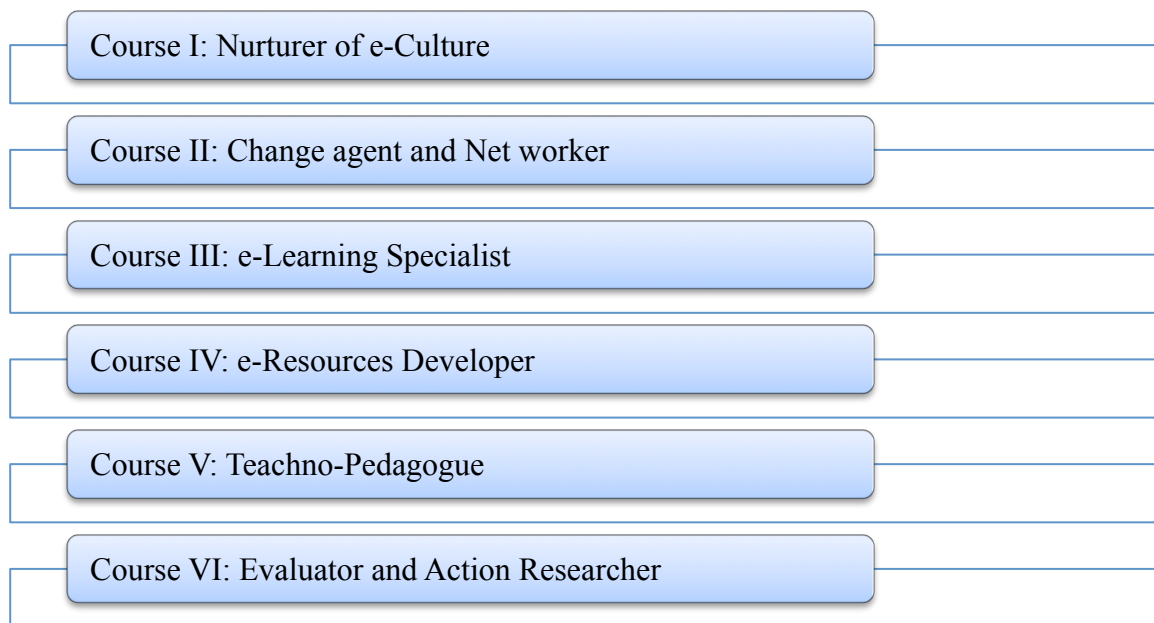
Program Structure

After conducting a job analysis by a group of about 35 experienced educators, six roles, the teacher is expected to perform in the emerging connected knowledge based tech savvy society, were identified and considering the activities to be performed and competencies and skills required for teacher to perform those activities/roles best possible way, six courses were designed, developed and deployed by the participating educators working for almost five years in the six course teams. [3].

Course Work

The total program consists of the following six role based courses along with learning activities, assignments and a project work (equated with one course of study) for the duration of two years, with the weightage of eight Credit Points each, totaling 56 CPs, to be completed in maximum period of five years:

Figure No. 2

Course I: Nurturer of e-Culture

Course II: Change agent and Net worker

Course III: e-Learning Specialist

Course IV: e-Resources Developer

Course V: Teachno-Pedagogue

Course VI: Evaluator and Action Researcher

Six Roles: Six Courses

This number may increase later, when newer roles are identified and courses developed for learners to choose.

(a) Learning Activities

The learning activities require learner to perform tasks which include practical work such as pedagogical analysis of school subject, concept maps, self-study of topics specifically prescribed; preparation and use of instructional material, teaching aids, PPTs etc.

(b) Practical work

The learning activities prescribed, practical work suggested and the assignments given are all field related, embedded in the course content and are open ended, open questions for free personalized application and skill development, providing for a variety of practical applications for development of self, as well as, the situate-class, school, community. Individuals are free to work on any application, resulting in, some new product or service or application.

(c) Project work

One major project involving field work related to situate development is a compulsory component. Project work could be related to education or industry like content development, infotainment, or edutainment. It has to address to the problem of real life like / work situation, in addition to the intellectual / creative growth of an individual and improved quality of the product etc. Project work is given weighatage of eight CPs.

Practice Lessons

Internship for school experiences includes Macro lessons & Micro-lessons to be conducted in technologically different learning environments, such as On-Line/Virtual Learning Environment-TEE (20 e-lessons), Mixed Learning Environment (20) and F2F Conventional Learning Environment (10), Total 50 lessons, all guided, planned, executed, supervised and assessed with detailed feedback to learner. However, in the pilot run it was decided that sample 2 lessons each will be conducted in six settings viz. Individual + computer with and without internet, small group with and without mentor, teleconferencing/distributed classroom and Technology enhanced classroom in f2f mode

e PASS

Major **t**echnology support in the form of e Platform and Support Services (ePASS), is provided by MKCL [4], a state government sponsored corporation, a business house established for propagation of mass computer literacy through a network of over 5000 Authorized Learning Centers in the state well equipped with more than 35,000 computers and state-of-the-art hardware, software and internet connectivity.

MKCL helped in creating and managing the e PASS including mechanisms and management tools and techniques like ERA- a LMS for the students, Course Design and Integration Framework (CDIF), Assignment Management System, Distributed class, using SABACETRA and ADOBE Connect as web conferencing tools for Course Teams for

designing, developing, deploying and delivering, as well as, using and updating the course ware and SLM e.g. OER / Social Wealth etc, created through learning activities.

The ePASS provided support to students in their self study, to create and maintain e-Portfolio storing the artifacts created throughout the program, as well as, to work in groups, establish network for sharing learning resources, creation of databases, record keeping and developing tools for self and external assessment and evaluation.

Development Strategy

The whole exercise of development and deployment of the program is a participatory, co-operative, collaborative and consortium approach. It begins with the basics like identifying the key roles teachers are required to play and the competencies the teacher must possess to perform those roles, effectively. Based on this identification, the teams decided the expected learning outcomes for each course which helped in identifying and selecting the content to achieve those learning outcomes. A learning situation is developed to perform the role for resolving the problem and focused role is assigned, learning activities – both assessable and non-assessable – are prescribed, learning resources like suggested readings – both essential & additional – specified, reflective assessment of the learning activities by self is conducted and artifacts collected for developing Portfolio. Continuous review and updating of courses is done.

Curriculum Transaction

The curriculum transaction is on-line through Tech-MODE, through audio-graphic and video conferencing facilities reaching out to the schools and workplaces and managing interactive activities amongst users through three basic processes viz. Virtualization, Digitization and Customization.

Delivery Modes

The delivery of the courses is through distributed class, power point and multi-media presentations and through supplementary learning material in multiple formats, print-non-print, including lectures, audio-video cassettes, CDs, journals and textbooks, e-books, readings on net/websites and discussion etc. with a very powerful and continuous, virtual, as well as, real time student support system. The major delivery modes include

   (i)   Distributed class
   (ii)   Self – study: learning activities
   (iii) Group work: collaborative / cooperative learning
   (iv)   Mentoring, tutoring and assignments
   (v)   Project work

They are briefly described here.

(i) Distributed class

Distributed Classes were conducted virtually from MKCL/YCMOU and received by learners at Study centers, Home, school- anywhere convenient to them. Distributed class activities include selection of the topic and expert, one page note on presentation, presentation and discussion, group work on activities and assignments under the guidance of Mentor, recording and creating repository of all such presentations. Six such sessions by local experts and two sessions by invited experts per course are conducted.
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(ii) Self Study

Each student is expected to work on his own using computers for, on an average, 2 to 3 hours daily, with online support. Also, face to face interactivity, at study centers with locally available mentors, sharing his / her experiences, worries, successes etc with peers in the groups created and maintained for group learning and working.

(iii) Group work- collaborative and cooperative learning:

Each student worked in learning groups formed by them or by YCMOU, or, in the Network of such groups created by MKCL, in discussion sessions after distributed class-at Study Centers, planning and executing the plan of action with mentors to guide, sharing with others resources and insights built during self study.

(iv) Mentoring and Tutoring

A mentor is a local in-charge of 10 students and their studies for the whole program. All learning activities are monitored and supported by the mentor, continuously. The mentor provided support services to the students like guidance in learning activities for self-study, assignments for self and collaborative learning etc. The tutor is an expert for each course, to support students, mostly online, not locally, for all the six courses.

Reflective Assessment and Evaluation

Both formative and summative assessment techniques are used. Formative assessment of events and assessable learning activities is conducted using time bound tests and, of non-assessable activities through rating scales. Also assessment of project is done for individual and for group contribution. Assessment covers self and group learning activities, ICT skills, study skills and situational analysis skills developed, situational learning and situated development activities including assignments and major project.

Summative assessment at the end of the course is done by the Quality Assurance Team and a concerned mentor in a comprehensive Viva-Voce and cumulative grade point is allotted after the presentation by the student of his/her portfolio and reflective evaluation.

Just to summarize the evaluation procedures, different forms of assessment used in the model include written assignments, practical assignments, responses made to questions in chat

sessions, participation in group activities f2f and online etc. Final grade is awarded after evaluation of Portfolio, Project work and comprehensive viva-voce.

Since there is no course end / annual exam to be conducted but the assessment is continuous and comprehensive, as well as, on the basis of portfolio assessment, record keeping of the performance of the learner is very crucial. After successful completion of the program and acquiring required number of CPs, and after passing out comprehensive viva, the successful candidates get the Degree of B. Ed. (e-Education) certificate from YCMOU, the state Open University.

Up-gradation of courses

Continuous updating of the contents and the OERs for the program as an ongoing activity is a unique feature of this program. This is done by recorded interactivities and by continuous feedback that is obtained on day to day basis, as well as, in periodic review meetings, from all the players in the Networked System. This data is periodically analyzed for actionable knowledge, for learning lessons and for improving the program.

Paradigm Shift

This is an approach that comprises a total paradigm shift from old to new pedagogies and technologies, from static content delivery to dynamic learning resources like OERs, print medium to multimedia, local storage and access to distributed networked storage, limited local access to unlimited access to anyone/anywhere/anytime, no quality control to centralized quality assessment mechanism, non-replicating to replicating knowledge resources, and, single user to multiple user resources.

Impact

This program would equip the teachers to promote new learning processes such as learning to learn (self-study), learning by doing (performance), scaffolding (structuring), reflective thinking, learning through distributed class, personalized learning supported by e-learning resources (OERs),freedom to choose (Learners' autonomy), cooperative / collaborative learning (Group Learning), networked learning (distributed class) etc. resulting in development of learning communities through social networking.

Flowchart of the Model

The program is designed, developed, delivered, reviewed and assessed on the basis of above characteristic pedagogic principles of the model**.** These principles are reflected in all the practices of the program as indicated in the following diagram of the model:

Figure No. 3

Provider Institution	Learning & Development Process	Outcomes
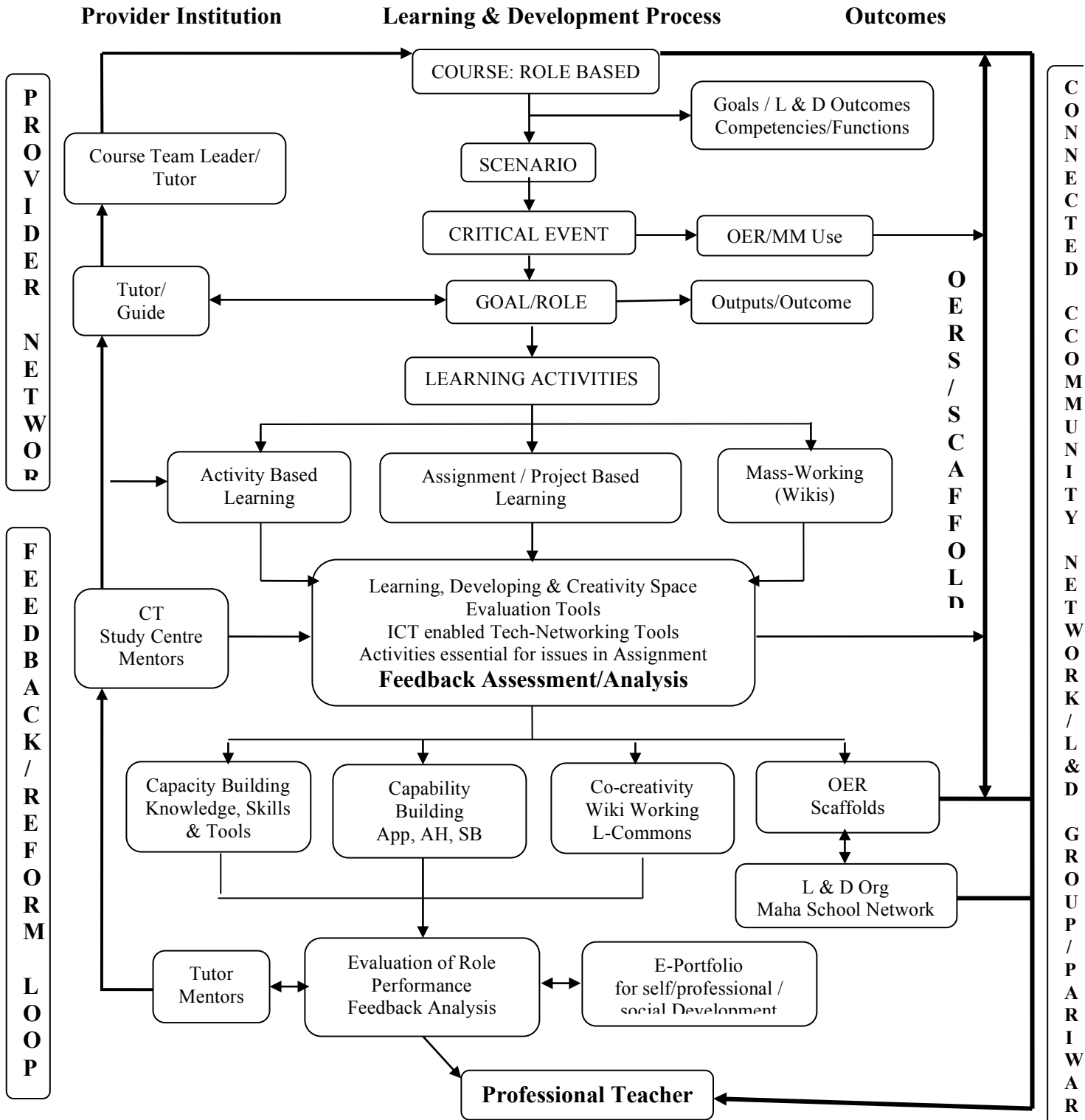
I-CONSENT: Constructivist Role Based Learning Model [5]

(after Takwale, Ram, 2011)

The pilot run

The pilot run of this program was conducted for two years at three study centers, with the help of network of local mentors and national and international experts using the e-platform. In the forty seven students registered for this online course in the pilot batch were fresh graduates, working teachers, housewives, professional technogogues and others. From their reflections and feedback the lessons learnt show that [6]:

- The learners were a heterogeneous group with respect to communication and computer skills, besides their background. Those not much exposed to ICT, felt isolated within an e-learning environment, handicapped in virtual interaction, but techno-savvy students had less anxiety and more interactivity.
- The 'blended' approach and the presence and support of mentors at the distributed class (f2f) helped them to overcome these problems gradually.
- By the end of first semester, they were comfortably using ERA & SABACETRA, created and used blogs and social networking sites like 'multiply' for interacting with each other, sharing tips, clarifying doubts etc.
- They could also actively participate in the Webinar conducted by an authority like Susan Kovalik. The e-seminar and other learning activities involved a lot of collaborative work resulting in the e-culture in their work to some extent.
- Students and course team members had highly gratifying experiences. They felt that constructivist open environment, collaborative efforts, reflection, realization of changed thinking and insights developed, made them better educators
- They were able to reflect on their self transformation (**Aarti's** reflection on her blog received appreciation internationally), how one's social behavior is changed like collaborative, cooperative learning (**Shijo** sharing his learning, posting notes) etc.
- Many of them completed the projects for situate development (such as **Sayalee**, a house wife, adopted a rural, disadvantaged school and used 'Multiply' network for mustering help and collaboration for building a digital library there).
- Capacity building of the learner (e.g. **Madhuka**r, a professional trainer, after completing this program, felt so much empowered that he left the lucrative job and embarked on independent business-training workers for specific task).
- Continuous review and improvement in periodic review meetings of functionaries and students - resulted in useful up gradation of courses and technology.
- Transforming education for sustainable development is a major outcome, the three situates/locales for development being Class, School and Community.

Concerns felt:

While developing this program some concerns in the field came up to fore. For example, educators, and students of this program were grown up adults, a product of conventional F2F schooling. De-learning and re-learning was difficult for them.

- Work culture and study habits of students and mentors were not very conducive to learning and working in e - environment. Initially they found it difficult to cope up

with newer activities like reflective thinking, group working, working with the person-person and machine-person interactivities, and use of ICT etc.

- The course writers had to undergo a painful process of un-learning conventional pedagogy orientation and learning and adopting constructivist pedagogy for work, orienting themselves in situated learning design, working for creating real life situations, developing courses, producing and field testing the program, getting feedback and updating the courses and finalizing the program for global marketing

- It was very difficult for participants to remain on the new line of thinking. They were constantly going back to old content-centric pedagogical approaches and ways of thinking and working which was quite frustrating to them.

- On the hind sight, every one realized (including the seniors like Takwale/ Deshmukh and course developers) how much their thinking had changed and insights developed during the years of working together in the program.

- There was a feeling of accomplishment all around when the pilot program was launched by Sir John Daniel, CEO, COL. They were motivated to do more-ready to accept multiple roles as student, mentor, tutor, expert, evaluator, provider, etc.

Most of above reservations were found rooted in uncertainty and unfamiliarity rather than the merit or limitations of the approach. Hence, subsequently the first two courses viz. Teacher as e-Culture developer and Networker, as well as, a two weeks training module in ICT applications - to ensure minimum required computing skills - are prescribed as a pre requisite for study of further courses.

Current Status:

At I-CONSENT, after successful pilot run (2009-11) and using the insights developed during the pilot, improving the Model and updating the program in the context of the feedback from the field, we are now in the process of fielding the program as a regular online teacher training program, through YCMOU in June, 2013, scaling it up in at least 10 centers/universities, covering about 1000 learners with the help of about 100 trained educators, thoroughly oriented in to the philosophy and practices of this innovative Model.

Also, alternatively, for the convenience of the working teachers, interested in ICT applications in teaching learning process, we are offering the program in a different format. We have converted the entire program into 10 role based, small, independent modules- in service online certificate/diploma courses with the facility to accumulate credits earned, as continuing education programs from the next semester, in June, 2013.

As a preparatory to this conversion, a workshop is scheduled in the first week of April, 2013 for the educators involved in the B.Ed. (e Education) program to develop the Open Educational Resources (OERs) for these courses with the support of COL. Prof Som Naidu, from CSU, Australia will be the expert resource person.

Conclusion

The program is now ready for adoption and use. Though the program is designed developed and field tested in the context of Indian continent, the commonality of the need of QE4A and the similarity of the adverse conditions found in the developing countries, especially the commonwealth countries, it makes it easier to adapt this Model to suit their cultural needs and educational practices. I-CONSENT is committed to support and help any commonwealth country in such adoption.

Overall results of the pilot run of the program are very positive and promising. The program is modified in the light of these experiences and now is available for the international consumption with a development centric-learner-centric model which will provide learning for development, through real life problem situations of which the learner is a part-experiential, contextual learning model to integrate the process of educational transformation in the system of - living-working-learning-developing together in a connected society with large techno-social structures. This model has indicated potential to provide a key to a much larger issue of QE4A.

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