

Education and Research in Global Information Environment

Shreyans Sharma

Assistant Professor, Agrawal P.G College

University of Rajasthan, Jaipur, Rajasthan, India.

ABSTRACT

The education area is becoming now the place where many technologies meet, converge and are tested by real practice and co-existence. Education and culture globalisation and internationalization shall not have impact on national cultures. In modern networked information environment the main paradigm of professional education is sufficiently changed in actual roles of teacher and students.

Keywords: Education, Learning, information, Learning, Network.

INTRODUCTION:

Informing now Information Age economy; knowledge and skills has become the key factor of competition. New Knowledge Based Companies (KBCo) incorporates constant technologies' development and change as well as learning acquired skills in their production system. Internet and Global Information Infrastructure (GII) development in the world changes the main paradigm in Education and Research

Education should respond on global challenges of forming Information Society in providing necessary background for successful people living in this new knowledge based formation which is:

- Forming basic knowledge and motivation for constant improvement of knowledge and skills
- Forming moral principles of co-existence in open Information System, accepting of majority of truths and inadmissibility of harmful actions because of its possible global impact in information environment
- Setting up life-long learning self-motivation
- Provide free access for learning and training materials.

The education area is becoming now the place where many technologies meet, converge and are tested by real practice and co-existence. Education activity is becoming an important part of general company's activity (not withstanding the structural affiliation -- to company or university). Education becomes a conductor and promoter of new technologies and area where new approaches and new social imperatives are forming now. New approaches in education and training should increase the assistance-to-contributive effect, i.e., education and training organizations should become the knowledge based organizations themselves and

implement KBCo corporate model. Contributive effect in IT education should shift from secondary process to productive. Professional education should utilize learning process (or its results) for creating information and knowledge base for teaching next generation of students and/or trainees.

Classroom integration into Internet will demand special approach for curriculum design and instructional methodology used that should be focused on reaching main educational goals because of learners in such environment have real choice "to stay" in the class or escape into Internet surfing. Curriculum have to take into account existence of such global information environment as Internet.

Education and culture globalization and internationalization shall not have impact on national cultures. In these circumstances, education at its initial stage has to inculcate national and cultural values to learners. Students should accept priorities of national values in integration into the global Information System. During education and further lifelong learning people should take over new global criteria (but not change values) applying and adopting them to the national values.

Rapid technological changes and economy IT-directed restructuring in Ukraine (as country with emerging technologies) raise another problem with "professionally lost" generation. Wide demand of knowledge intensive qualified workforce in IT (and programming particularly) causes problems with completing professional education. Students that have at least initial knowledge in IT and programming are absorbed by many small companies for serving their IT needs. In difficult economical situation they are forced to earn money that, in general, contradict

with needs for intensive learning according to curriculum. Young people of the third-fourth years in Universities go to professional sphere without formed professional credo that could affect their potentiality to innovative qualification growth in the future. Professional consciousness should correspond to the professional knowledge to secure constant and successive professional growth and knowledge acquisition but not only skills.

1. Paradigm shift in professional education

In modern networked information environment the main paradigm of professional education is sufficiently changed in actual roles of teacher and students. Old methodology was based on concept of classroom as the ultimate place of knowledge receiving where teacher plays the role of source and transmitter of information and knowledge and learners play the role of receivers. Teacher could learn from his/her experience. But now with rapid technologies' changes very few teachers can teach from their own experience.

The problem for education is the competition between transnational industry leaders provides increased pace of technologies, development and changes. Therefore, in current conditions the main paradigm of education is changed to co-operative and contributive learning in which teacher plays role of information producer and curriculum adviser but students act as information accumulators and knowledge acquirers. They become responsible for necessary knowledge acquisition based on curriculum experience but teacher has to manage education process and set up an appropriate motivation system, in other words, teacher will teach students how to learn and set motivation frame for successful and timely curriculum performing.

Students are learning in cooperative project based environment oriented on producing final results that help them to acquire knowledge in adjacent areas of common project group competence. Contributive process of education in IT should work on developing meaningful information resources increasing national presence in GII. The real challenge for countries with emerging technologies in Professional Education on IT and IT based courses is Constructivist instructional methodologies incorporating active position of teacher and students in tight interaction with global information environment:

- **Project or Problem Based Learning (PBL)** that is effective in information and knowledge rich environment with developed infrastructure
- **Cooperative and Contributive Learning (CCL)** that is PBL adopted to the conditions of emerging technologies

and developing communication and information infrastructure

2. Educational projects -- the key part of proposed instructional methodology

Important component of proposed instructional methodology belongs to students independent work that includes development of educational course projects. All educational projects include development of real networking projects for concrete academic and educational institution including planning necessary information services for operational needs of concrete organization or users' group:

- Local conditions investigation
- Defining user's groups in organisation and their information resource needs
- Preparing Detailed Technical Description of the Project
- Network structure design and modeling
- Selection of Hardware, Software and Communications and Internet Services Providers for project realisation on comparative basis among companies and providers available in the region
- Corporate/organizational Internet/intranet information server design
- Creation of devoted to the project WWW server information structure and its pilot implementation on educational server.

Generally, complex educational projects consist of two main components: network infrastructure design and information server structure and content development. Projects are recommended to be developed by groups of three or four students and include all necessary components of real networking project of campus or company's network building including organization of optimal cooperative work of the project group. Templates, specimens, forms of all necessary documents for project development and tender organization are available on educational server. Special lecture on project design and management is included into lecture course.

3. Main Principles of Teaching in Networked Information Environment

Experience acquired during implementation of elements of PBL and CCL instructional methodology in teaching Networking Information Technologies and Services at Computer Aided Design (CAD) department in NTU "Kiev Polytechnic Institute" allows formulating the main principles of education in Global Networked Information Environment. These principles can provide real base for

establishing active position of teachers and creative role of learners.

A. Learning from the Internet -- Contributing to the Internet

The new paradigm of education in modern Networked Information Environment should be incorporated into instructional methodology development

B. Cooperative Learning Model + students' initiative.

Using Internet/Intranet technologies Teachers and Learners can mutually benefit from implementation and mastering new technologies. Key role in exploring this principle belong to educational projects and rely on Cooperative model of course management that effectively use students initiative in mastering new technologies

C. Contributional Learning model.

In conditions of wide use of computers and multimedia technologies among students and rapid technology changes, teachers sometimes cannot have strong benefits in practical technological experience. In these conditions teachers should play the role of mentors and/or managers of educational process or curricula. Teacher can propose some idea of *Contributional learning* when students or student groups work on the projects that will have real implementation in building Campus network or development of useful information resources.

D. Integration of traditional and distance learning.

New networking environment provided by Internet/Intranet eliminate differences between traditional and distance learning, however, stressing on interactive on-line (IRC, conferencing) and off-line (e-mail, mailing lists) communication between teachers and students.

E. Concept of "active position".

Complete implementation and full benefits from using Internet and New Information Technologies in Education can be reached only by using this principle that is very close to the idea of Contributional learning. It is not enough to give students and teachers Internet access only. To use effectively Internet, faculties should start development of their own Internet resources and creation of its own Internet presentation.

CONCLUSION:

Education in current rapidly changing global information environment has to challenge new approaches and paradigm shift. The importance of Education, particularly professional education, is increasing now as necessary condition for successful implementation of new information and Internet technologies. **Co-operative and Contributive Learning** model was found as effective approach for developing new instructional methodology of Teaching in Global Information Environment. Formulated main principles of this instructional methodology, however, leave the key role to the *teacher* and his personality who must be able work as tutor, project manager and team leader.

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