Integration of Information Technology in School Curricula

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Change in the rate of change has become a global phenomenon. Its origin can be sought in the infotech global society. The infotech society has its own presumptions, culture and discipline. It seems that the global infotech society is lost in media crowd. World Wide Web is on every tongue whether intelligible or not. Does media and message implosion ensure message, meaning and intelligibility ? Does expansion of hardware ensure compatible software ? Why are there gaps between designing development and implementation of information technology ? Now the society cannot survive without info-tech.

With the advent of information technology, there is a shift in the basic paradigm from teaching to learning. Information technology has many demands from the learning society and vice versa. Politicians, businessmen, administrators, teachers, students have their own perspectives and expectations of information technology. There seems to be more of divergence of perspectives than convergence. Due to E-mail media and instantaneous information flow there is immediate change in expectations in all walks of life. Frogs are bouncing because their entire process of dissection which was earlier done in laboratories for educating learners has been captured in CD's; so no more destruction of life. There is saving of chemicals because of simulated titrations. There is a shift from gurukul class to countrywide class and worldwide class. There is a shift from LAN (Local Area Network) to Internet. There is a shift from man-man interaction to man-machine interaction to machine-machine interaction. Man has extended its self in the form of multimedia systems. But our education system at large seems to be indifferent towards media. There is a need to explore why.

Educational stimuli in the form of electro-magnetic signals are available everywhere in the space. The question is that of sensitivity to them and capturing them selectively through different electronic receivers. Mass media have perfected themselves from one way communication to two way communication. There is a shift from demassification to massification, electronic deschooling to integration of electronic media into schools.

With the advancement of information technology, the speed and credibility of educational electronic media is relatively established. There is a genuine shift from

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print media to electronic media because their power of omnipresence, immediacy and recency. The present level of information technology the world has arrived at is a result of sustained struggle. There is a need to understand why educational institutions have not been in a position to appreciate this struggle. Why is the information technology either not utilized or underutilized in the educational institutions ? There is ample research evidence that there is definite gain through information technology through various media such as radio, T.V., computers. But instead of being implemented at the functional level why are these researches resident in the carrels? Why is there added media crowd rather than media culture ? Why some schools do not have even a single PC whereas, others are on the Internet having expanded laboratories ? How long can the schools survive without information technology in the global society ? There is an immediate need to integrate information technology in the school curricula. The present paper focuses on integration of information technology in following domains :

(a)   Integration of CAI in schools,

(b)   Integration of Internet into the school curricula, and

(c)   Integration of Children ETV.

(a) Integration of CAI in Schools

The term CAI refers to the system of providing on-line, direct, interactive instruction. Testing and prescription are included in the process of learning. Students can be presented with assignments, problems, exercises, reading material with the help of computers. Computer Aided Instruction is a set of programmed instructions. They are used to develop certain skills of the students so that they gain mastery over the subject matter.

A number of studies have indicated effectiveness of CAI. Prabhakar (1989) developed software for CAI and its comparison with Traditional Method for teaching semi-conductors at +2 level. The CAI was found to be effective in terms of achievement of students belonging to class XI and XII and also in terms of their reactions.

Himani (1990) conducted a study-development of CAI on microbes for class VIII. The developed CAI material proved quite effective which was quite evident through the significant gain of students and their reactions.

Mahapatra B.C. (1991) conducted a study on Development and Effectiveness of CAI in terms of Achievement and Abstract Reasoning of Class IX students. The developed CAI was found to be significantly superior to traditional method when the students mean achievement scores were adjusted with respect to intelligence. Similarly, Adhikari, Rajshree (1992) conducted a study Viz, Development of CAI Material on Cell and Cell

Reproduction for Class IX. The CAI was found effective in terms of achievement and reactions of students. Besides, Das (1999) conducted a study on exploring of CALM (Computer Aided Learning Material) on rhymes in different modes. The study revealed that :-

- *intelligibility of message is a function of interaction of message, medium and mode and receiver.*

- *composite modes may not ensure higher language learning.*

Khirwadkar A. (1999) conducted a doctoral study entitled "Development of Computer Software for Learning Chemistry at Standard XI". One of the objectives of the study was to study the effectiveness of the softwares packages in terms of achievement of the students. Pre-test - post-test and control-experimental group design was used for the study. The main findings of the study were reported that :

- *the software package was found to be effective in terms of academic achievement of the students,*

- *the students liked this method of learning,*

- *the school teachers showed a favourable opinion towards the developed software.*

Goel, D.R., Tomar, A., Khirwadkar, A., Das, A., and Joshi, P. (2000) conducted a project on implementation of CAI in a school of Baroda. The CAI packages implemented were Satellite (Standard VIII), Solar System (VIII), Magnet (VIII), Pollution (IX), Electricity (IX), Thermal Conductivity (IX), Biogas (IX), Organic Chemistry & Periodic Table (XI) & Chemical Bonding and Optics (XI). It was found that under the pretest-posttest experimental design the CAI were found to be effective irrespective of the subject. For control group-experimental group designs the CAI was found as effective as the traditional method of instruction. Hence, CAI may be used as an alternative method of instruction. Also the secondary school teachers were oriented on computer the software packages - Optics, Thermal Conductivity, Periodic Table and Chemical Bonding, Solar Sysem, Electricity, Magnetism Accountancy, Photosynthesis, Geometry, Rhyme, English, Cell Division and Balgeet. Though a number of studies have indicated effectiveness of CAI, it still does not find place at implementation phase at school level.

Some of the problems in integrating CAI in school curricula can be described as follows :

i) The available courseware packages are inadequate. The teachers feel diffident because most of them are not trained in using computers in schools. There is lack of trained manpower to implement CAI in schools. Inadequate hardware creates problems for implementing CAI in schools.

ii) There is a very little preparation on the part of polity and administration for implementing media in education. Mere sanction of hardware does not ensure its implementation in education. There are no specific computer curricula standardwise.

iii) There is lack of industrial support in :

- making computers available to the school at low price.
- producing enough software and courseware of educational interest.
- providing teaching staff to schools on payment basis for teaching computer as a subject in schools.

iv) Students have to pay high tuition fees for availing facility of computers in their schools. In order to over come the above problem we need to understand that computers are machines created by man. They can never dislodge man. The packages also have been created by man to make his own task of teaching simpler. It does not undermine the importance of the teacher. For proper intergration of Computer Aided Instruction teachers need to view the innovation from a different mind set. Teachers should be adequately trained for the same. There should be adequate provision for pre-service and in–service teacher education on computer education. Every teacher should be computer literate /educated.

Globalisation demands computer education to be offered as a special area at NTT, PTC, B.Ed. and M.Ed. levels. Progressively it should be offered as a core course. Also, in-service courses should be organised by agencies, such as, ISTE, AICTE & Schools of Computer Science in different Universities.

CAI should find a permanent place in the school timetable. The school should make proper provision for the maintainance of the hardware. If teachers and teacher educators are open minded in the use of computers as a tool for education then these machines can be better utilised for education.

Integration of Internet in School Curriculum

Computer education has recently been introduced in schools. Schools are facing many problems related to the accomodation of a new subject. It has to provide for hardware software and man-power but has not succeeded. The expectations of the society from education are very high considering the fact that changes are taking place rapidly in all spheres of life. Computer education itself has not yet been standardized with respect to infrastructure, syllabus and qualification of man power. It is hoped that :

- *all schools having facility of computers can very easily avail the facility of the Internet.*

- *Schools will have to register themselves with some ISP (Internet Service Provider).*
- *The facility could be initially provided only for special purposed i.e. a project for a student or a teacher preparing for a class topic.*
- *It could be integrated as an extension to the library facility.*
- *A few knowledgeable personnel should be available i.e. some teachers initially should be thoroughly trained in the use of internet.*
- *Many students in urban areas will have internet connections at home or atleast access to a cybercafe. Such students can have their own E-mail address and submit their assignments to the teachers.*
- *Administrators, teachers and students all over the globe will be able to communicate with each other. They will be able to share information, solve problems and be informed about the happenings in other parts of the globe.*

A basic training programme would be required for teachers and students to use the internet in the most efficient way. They will have to familiarize themselves with some commonly used functions of the internet like : i) Browsing, ii) Searching, iii) Communicating, iv) Integrating, v) Creating.

Browsing : It is commonly called surfing. Some commonly associated terms are W.W.W., Web Sites, Web pages, URL. Each website is identified with the help of a URL (Universal Resource Locator). The web sites lead to various web pages.

Searching : It is done mainly with the help of search engines. Some commonly used search engines are Lycos, Yahoo, metacrawler, exite etc. A search or an advanced search will enable a user to enter a key word and ask the engine to search. The search will be carried out according to the specifications of the user and will be provided with a list of web sites and related web pages.

Communicating : This service of the internet has brought a revolution in the entire system of communication. The E-mail service is faster and cheaper than most other systems. Moreover, it is more reliable and faster than the ordinary postal system (Snail mail). Various E-mail services like hotmail, yahoo mail etc. are available.

Integrating : When a search enables a person to collect information on a certain topic it can be integrated to make it more meaningful to the user. It will give a comprehensive account of the material.

Creating : It is an advanced step wherein web pages with links can be posted on the Internet for other users to avail the information. Dissemination of knowledge especially of journals, research papers etc. is easily possible.

Some problems which need to be overcome can be described as :

(i) Financial Viability : Internet service providers will charge schools for usage of internet for specific hours. Judicious use of the Internet is necessary otherwise it would turn out to be very expensive for the institutions because :

- *It will be very necessary for the teacher to superwise the activities of the children while they are using the internet. The children may go to unrelated sites or sites not meant for them.*

- *Students may chat with groups in chat rooms and even fix appointments with strangers. This could lead them to dangerous situations.*

Today, there is a need for students to get as much exposure as possible. So that they do not lag behind in the fast moving information age. At the same time, it is necessary that students are not confused and muddled up with the information they receive.

Integration of Children ETV

There are a variety of School Television Programmes in India. The children ETV programmes produced by the CIET of NCERT are telecast in many states. Similarly, ETV programmes are produced by the SIETs for local telecasts. While CIET produces programmes in English and Hindi, all the six SIETs located at Anmedabad, Bhubaneshwar, Hyderabad, Lucknow, Patna and Doordarshan National Network (DD-1) on all weekdays targetted at school children of classes 1 to 7. Also there are special series produced for children, such as, AIDS Awareness Programme. STV programmes are also produced by the terrestrial Doordarshan Kendras for local telecasts.

Sudame and Goel (1984) conducted a study on the Utilisation of School Television (STV) programmes in five schools of Greater Bombay. It was found that the STV programme viewing facilities in most of the schools were inadequate. There was a problem of multi-sections in a standard. None of the schools was found to have more than one TV set. The school teachers were not trained in using STV programmes for classroom instruction. Pre- and Post-telecast activities were not carried out by them. The STV programmes on Science were in Marathi only which did not suit the multi-lingual population for cities like Bombay. The STV programmes in English were found much below the levels of English medium students. Even then the programmes on Science could be well utilised by the Marathi medium schools. The programmes on English could be utilised by the non-English medium schools.

The studies conducted by Jaiswal K. (1988) and Doneriya, A. (1988) reveal that the contents and presentation of Science ETV and General ETV programmes for children were quite suitable.

Goel, Chhaya & Joseph Sancy (1996) conducted a study—Effectiveness of ETV programmes with and without note-taking. The objective of the study was to compare the adjusted mean achievement scores of ETV viewers with and without note-taking when pre-test scores are taken as covariate. Five ETV Programmes on Social Sciences telecast during September 1995 to January 1996 were tried out on 60 students of class VI of St. Raphel's Higher Secondary School, Indore. To measure the effectiveness of the Programmes achievements tests were constructed on each ETV Programme. The Post-test only control group design was used for conducting the study. The independent variables were ETV with note-taking and ETV without note-taking. The dependent variable was achievement of viewers on the ETV Programmes. Pre-test scores were used as convariate. It was found that viewing ETV Programmes with note-taking was found more effective than viewing ETV Programmes without note-taking in three programmes out of five. Whether note-taking while viewing ETV programmes facilitates or impedes effectiveness needs to be further examined.

Goel, D.R., Das, A. & Joshi, P. (2000) conducted a study on 'Implementation of Children ETV Programme in Experimental School'. The Education Television Programmes produced by GIET (Gujarat Institute of Educational Technology) are viewed by students of various standards. After watching the programme data was collected through observation, unstructured interviews, discussion and critical analysis of the programme. The programmes are analysed in terms of content matter, pedagogy and quality of telecast.

The content matter included topics like Curved Mirrors, Place Value in Mathematics, Phases of the Moon, Basic Alphabet in Gujarati, Making Masks, Poems, Dramas etc. The viewing programme was conducted from 9th Feb. to 22nd Feb., 2000. The findings of the study can be studied as under :

- *The students enjoyed watching such types of programmes.*
- *Learning took place by watching ETV programmes.*
- *The students felt that they would like to have such programmes in their timetable.*
- *The students learnt seriously from the content based programmes whereas enjoyed poems & dramas from recreation point of view.*
- *Content matter of a programme was scattered over various school subjects.*
- *A need was felt to improve the camera-work to make the programme more effective.*

Implementation of ETV—Impeding Factors :

- *Lack of infrastructure facility in the schools.*
- *Educational Television Programme is not integrated in the schools time table.*

- *Telecast time does not match with school time table in case of morning and afternoon schools.*
- *Topic telecasts are not known to the class teachers before hand.*
- *Telecast of programme for a particular class are not at regular intervals.*
- *Lack of technical experts to arrange the ETV viewing in schools.*
- *Little financial support from the Govt. to maintain the TV sets.*
- *No special room in the school to view the ETV programme.*
- *Reception of ETV programme in remote areas of India where it is most wanted is grossly neglected.*
- *Lack of software in school subjects for telecast regularly for a particular class.*

Steps For Implementation of ETV

- *Ascertain the needs of the target users.*
- *Focus on formative research for designing, developing and implementing the ETV programmes.*
- *For lower primary levels the programme of half an hour could be a composit programme on different subjects, whereas, for higher levels it could be on a single topic.*
- *The schedules of the programmes to be telecast could be made available well in advance.*
- *There should be sizeable syllabus coverage through ETV.*
- *ETV programmes should be both syllabus based and enrichment type.*
- *ETV should be integrated in the schools time-table.*
- *There should be adequate viewing facilities in the schools.*
- *There should be adequate financial support to maintain the TV Receivers.*
- *The quality of the ETV should be observed.*

Concluding Remarks

There is a need to integrate the different media, such as, Radio, TV, Computer, Photophones judiciously in education. The contents of education at different levels need to be analysed thoroughly and distributed over different media. Courseware should be differentiated mediawise at different levels. The message should be mediagenic and vice versa. Along with the added focus on hardware expansion there should be due focus on compatible quality software. Merely having hardware and software combination is not adequate. The question is how to integrate information

technology in education. More than design and development, there is a problem of implementation, maintenance and upgradation. There is an immediate need to integrate the different media in the time tables of schools. Also technology in education can be realized only through trained personnel. The education personnel need at least minimal training on different media to take off. There should be due focus on formative research and evaluation for media production and utilization.

In this age of information technology learning accountability is more of learner than of teacher. Teachers on the electronic media should tend towards perfection in educational instruction and communication. Technology cannot tolerate the knowledge poverty. Information technology can develop only through valid and upto date knowledge and its communication. In the beginning it would be to the advantage of schools if external bodies like the industry provide financial support for the integration of information technology. It is heartening to note that private institutions are taking up the responsibility along with the government to provide multimedia and CD's levelwise and syllabuswise. Transnational Alternate Learning for Emancipation and Empowerment through Multimedia (TALEEM) has initiated Basic Education Support Television (BEST) for primary school going children of 10,000 schools in selected districts of the six Hindi speaking states.

There should be provision for upgradation of technology along with maintenance by providing grants till the schools become self-sufficient. Software upgradation and appropriate training is equally essential for optimum usage of the technology. Both the inter-personal communication and mediated communication should have due place. Media are the extension of man. Rather than competing with the media man should try to perfect the media and utilise them optimally. There is a need to develop proper media culture, otherwise, media implosion and information explosion will be meaningless. There should be convergence of perspectives of the Administrators, Teachers and Researchers for the optimum utilisation of IT. Also there should be proper networking amongst different media. Schools and Universities need to be more sensitive to information technology.

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