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Composed by: Shahin Parveen

Content

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Vice Chancellor's Message

It is a delightful moment for me to know that, continuing its past endeavour to disseminate new knowledge in the field of education, the Faculty of Education is bringing out fifth issue of its International Journal, 'Jamia Journal of Education- A Biannual Publication' with 'Teacher Education and e-learning' as its broader theme . I believe that in the advent of globalisation and information technology, no discipline can sustain without e-learning resources let alone teacher education.

I found it even more interesting that the Faculty of Education did a pioneering effort to give space to both experienced faculty and young scholars across nation to share their marvelous ideas and concerns on the theme chosen through its journals. The beautiful composition of research papers and scholarly articles make the journal a more valued treatise.

I am sure that with more transnational contributions to its bouquet, the journal would become the readers' most sought after choice round the globe.

(Prof. Talat Ahmad)

EDITORIAL

Educational growth of any nation is largely determined by e-learning. Hence, there is a growing demand worldwide for teachers who have the skills to prepare students to be successful in a technology-infused, knowledge-based society. E-learning can play a critical role in preparing a new generation of teachers, as well as upgrading the skills of the existing teaching force to use 21st century tools and pedagogies for learning. Significantly, two trends that the world is confronted with are the exponential growth in knowledge and technology that is transforming all aspects of global society and economy and the increasing shortage of teachers in both developing and developed nations. E-learning can provide future and existing teachers with access to rich information resources, courses, tools, training programs, online communities of practice, and opportunities to collaborate with other educators around the world.

The fact is that e-learning has become one of the fastest growing components of the high technology sector in a short span of time. Although, most schools in developed nations provide Web access in the classroom, the use of e-learning for teacher development, however, raises important issues for governments and academic institutions related to policies, funding, instructional practices, research needs, technical infrastructure, and support. The issues pertaining to e-learning which includes accessing information repositories for learning and blended learning must be addressed judiciously.

Although e-learning may represent a powerful tool to support teacher development, successful implementation of this mode of learning requires careful planning and consideration of a number of important factors.

We are happy that the present journal includes both scholarly articles and research papers which address the larger issues of Teacher Education with reference to e-learning. Although, we received a host of contributions in this regard across the nation, owing to space crunch, some of them could not be accommodated. The papers included in the journal were meticulously peer reviewed, edited and proofread before finally being sent for publication.

We hope that in the next issue with new theme, we would definitely try to consider some of writers' contributions which address the key issues of education holistically.

Editors

Effect of Computerized Two-Tier Diagnostic Test and Remedial Learning System in Science on Achievement in Science

Neeru Sharma[1] & D.N. Sansanwal[2]

[1] Assistant Professor & [2] Former Head and Dean

[1] Ramgarhia College of Education, Phagwara (Punjab) &

[2] Department of Education, DAVV, Indore,

Email: neeru001@hotmail.com &dnsansanwal@email.com

Abstract

The study aimed to analyze the effect of Computerized Two-tier Diagnostic Test and Remedial Learning System (DTRLS) on students' achievement in Science. Through this research, an attempt was made to answer questions such as; Is the DTRLS effective in improving Achievement? Is the DTRLS superior to Lecture Method in improving Achievement when groups were matched with respect to Pre-Achievement in Science? Whether Cognitive Style is a factor to influence Achievement in Science? Experimental Group was taught with help of online Diagnostic Test and Remedial Learning System (DTRLS), while Control Group continued with Lecture Method.Data were analyzed using

2×2Factorial Design ANCOVA. DTRLS was found to be superior to Lecture Method in improving Achievement in Science when Groups were matched statistically with respect to Pre-Achievement in Science. Further, DTRLS was found to be better suited to students with Field-independent Cognitive Style than students with Field-dependent Cognitive Style when Groups were matched with respect to Pre-Achievement in Science.

Key Words: Diagnostic Testing; Achievement in Science; Remedial Learning; Cognitive Style; Analysis of Covariance

Introduction

Science, by its very nature, is a highly conceptual subject and although it has logic and internal consistency, yet it is considered difficult because students find divergence between classrooms teaching and

student's perceptions (Vahia, 2013). Research shows that the majority of teachers do not effectively diagnose students' learning problems, especially at an early stage of their learning process (Costa, Marques and Kempa, 2000; Taber, 2001). Two-tier Tests can ascertain common misconceptions that students frequently have and can suggest suitable remedial methods in order to improve students understanding of various concepts (Treagust, 1995; Wang, 2004; Caleon & Subramaniam, 2010; Treagust, 2010 and Sharma, 2015). Experiments on Computer Based Diagnostic Tests indicate that these tests work well and helped the teachers as well as students in identifying the grey area of each and every student (Alderson & Huhta, 2005; Sansanwal 2009).

One of the variables that influence the learning in Science is Cognitive Styles. Field Independent people are characterized by their ability to distinguish and coordinate items extracted from a complex stimulus context that may be confusing for others. Field Dependent people, however, tend to preserve the holistic nature of the stimulus and conform to the prevailing field. Cognitive Style is related to achievement in Science and many researchers like, Bahar and Hansell (2000); Danili & Reid (2006) and Sharma (2015) have reported that Field Independence had an edge over Field Dependence. On the other hand Lawson and Thompson (1988) have reported that Cognitive Style was not significantly related to the number of misconceptions in Science. More studies including different types of testing instruments need to be conducted to get a better understanding of the nature of Cognitive Styles and their possible relation to students' learning difficulties.The present study was an attempt in this direction.

Objective

To study the effect of Computerized Two-tier Diagnostic Test and Remedial Learning System (DTRLS), Cognitive Style and their interaction on Achievement in Science when groups were matched with respect to Pre-Achievement in Science.

Hypothesis

There is no significant effect of Computerized Two-tier Diagnostic Test and Remedial Learning System (DTRLS), Cognitive Style and their interaction on Achievement in Science when groups were matched with respect to Pre-Achievement in Science.

Experimental Design

The present study was experimental in nature. The study was designed on the lines of Non-equivalent Control Group Design. Students of the Experimental Group were taught through DTRLS developed by the investigator while the students of Control Group were taught through Lecture Method. The whole strategy had two parts. Part one consisted of testing students with an online system of Two-tier Diagnostic Tests. The items in Two-tier Multiple-choice Diagnostic Tests were specifically designed to identify students' misconceptions and gaps in Conceptual Knowledge related to the selected Concepts. Then based on the Diagnostic assessment of students, Multimedia based Remedial Teaching Materials were provided to them. At the end of the Treatment, the same Achievement in Science Test was administered which was done before the start of the Experiment.

Sample

The Sample comprised 187 class IX students, belonging to different schools of Kapurthala and Jalandhar District of Punjab State (India). The age of the students ranged from 14-17 years. Out of 187, 87 were boys and 100 girls. The schools were randomly assigned to the treatment. The Experimental Group had a total of 91 students (42 boys and 49 girls), while Control Group had 96 students (45 boys and 51 girls).

Instruments

Achievement Test in Science: The Achievement in Science was assessed with the help of Achievement Test in Science developed and standardized by the investigator. Achievement Test in Science had a total of 70 items. The Test-Retest Reliability Coefficient was found to be 0.80. The Content Validity of the Achievement Test in Science was established.

Group Embedded Figures Test (GEFT): The Cognitive Style of students was assessed with the help of Group Embedded Figures Test (GEFT) developed by Herman A. Witkin, Philip K. Oltman, Evelyn Raskin and Stephen A. Karp (1971). The GEFT contains three sections: the First Section contained 7 very simple items and was primarily for practice, and the Second and Third Sections, each of which contained 9 more difficult items. High score on the test indicated Field Independent Cognitive Style while low score indicated Field Dependent Cognitive Style. Reliability of the test was estimated by finding correlation

between Two Sections of the test with identical time limits and was found to be 0.82 for both males and females.

Procedure of Data Collection

Study was experimental in nature and involved two groups. Both the Experimental and Control Groups were pre-tested by administering Achievement Test in Science developed by the investigator. The students of Experimental Group were taught through DTRLS and were identified for their misconceptions and gaps in knowledge. Further they also received Multimedia based Remedial Teaching Materials on the specific Concepts, where students were tested to have gaps in learning. On the other hand, no treatment was provided to Control Group. The Control Group was taught the same Concepts through Lecture Method. At the end of the treatment, both the groups were post - tested with the help of the same Achievement Test in Science that was used for pre-testing. The moderate variable, namely, Cognitive Style was assessed during the experimentation by administering GEFT.

Results

The Objective was to study the effect of Computerized Two-tier Diagnostic test and Remedial Learning System (DTRLS), Cognitive Style and their interaction on Achievement in Science when groups were matched with respect to Pre-Achievement in Science. The data were analysed with the help of 2×2 Factorial Design ANCOVA. The results are given in Table 1.

Table 1: Summary of 2×2 Factorial Design ANCOVA of Achievement in Science by considering Pre-Achievement in Science as a Covariate

Source of Variance	Df	$SS_{y.x}$	$MSS_{y.x}$	F-Value
Treatment (A)	1	662.57	662.57	49.09**
Cognitive Style (B)	1	124.28	124.28	9.21**
A X B	1	79.30	79.30	5.88*
Error	182	2456.52	13.50	

** Significant at 0.01 level   *Significant at 0.05 level

Effect of Treatment on Achievement in Science by considering Pre-Achievement in Science as covariate

From the Table1, it can be seen that adjusted F-Value for Treatment is 49.09, which is significant at 0.01 levels with df = 1/182. So there was significant effect of Treatment on Achievement in Science of students when Pre-Achievement in Science was taken as covariate. In this

context, the null hypothesis, namely, "There is no significant effect of Treatment on Achievement in Science of students by considering Pre-Achievement in Science as a covariate", is rejected. Further, the adjusted mean score of Achievement in Science of DTRLS Group was 48.65, which is significantly higher than those of Lecture Method Group whose adjusted mean score of Achievement in Science was 44.28. It reflects that DTRLS was found to be significantly superior to the Lecture Method in terms of Achievement in Science when both groups were matched with respect to Pre-Achievement in Science. It may, therefore, be said that the DTRLS was found to have superior Achievement in Science as compared to Lecture Method when Pre-Achievement in Science was taken as covariate.

Effect of Cognitive Style on Achievement in Science by considering Pre-Achievement in Science as covariate

The adjusted F-value for Cognitive Styles is 9.21, which is significant at 0.01 levels with df = 1/182 (vide Table 1). It indicates that the adjusted mean scores of Achievement in Science of students belonging to Field Independent and Field Dependent Groups differ significantly when Pre-Achievement in Science was considered as covariate. In this context, the null hypothesis, namely, "There is no significant effect of Cognitive Styles on Achievement in Science of students by considering Pre-Achievement in Science as covariate", is rejected. Further, the adjusted mean score of Achievement in Science of Field Independent Group was 47.30, which is significantly higher than that of Field Dependent Group whose adjusted mean score of Achievement in Science was 45.67. It may, therefore, be said that Field Independent students had better Achievement in Science than Field Dependent students when Groups were matched with respect to Pre-Achievement in Science.

Effect of Interaction between Treatment and Cognitive Style on Achievement in Science by taking Pre-Achievement in Science as Covariate

From the Table 1, it may be observed that the adjusted F-value for interaction between Treatment and Cognitive Style is 5.88, which is significant at 0.05 level with df = 1/182. It means that Field Independent and Field Dependent students taught through DTRLS and Lecture Method benefited differently in terms of Achievement in Science when Pre-Achievement in Science was taken as covariate. In this context the null hypothesis, namely, "There is no significant effect

of interaction between Treatment and Cognitive Style on Achievement in Science of students by considering Pre-Achievement in Science as a covariate", is rejected. In order to know the trend of effect of Interaction between Treatment and Cognitive Style on Achievement in Science when Pre-Achievement in Science was taken as a covariate Graph 1 has been plotted.

Graph 1: Trend of Effect of Interaction between Treatment and Cognitive Style on Achievement in Science by Considering Pre-Achievement in Science as a Covariate
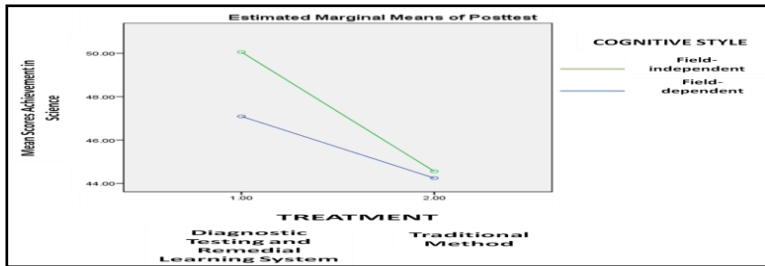
From Graph 1, it can be seen that in Experimental Group, Field Independent students had significantly higher Achievement in Science as compared to the Field Dependent students. On the other hand, in Control Group also, Field Independent and Field Dependent students had about equal Achievement in Science when pre-Achievement in Science was taken as covariate. Further it can be seen from Graph 1 that Diagnostic Test and Remedial Learning System was found to be better suited to Field Independent students than Field Dependent students when groups were matched with respect to Pre-Achievement in Science.

Discussion

Findings of the study indicated that DTRLS was found to effect Achievement in Science positively and it was superior to Traditional Method in attaining higher Achievement in Science when groups were matched with respect to Pre-Achievement in Science. This might be because DTRLS holds two key advantages over regular classroom teaching. DTRLS offered Concept specific Assessments that provide teachers and students with timely feedback, i.e. giving feedback to individual students within five minutes of testing. A second advantage of the DTRLS is that it provides more detailed Diagnostic Report about each student's areas of strength and weakness which is not possible in

Traditional Teaching. The DTRLS attempted to "diagnose", and not just "report" as happens in the overburdened traditional teaching. Further, this finding was in line with Chandrasegaran, Treagust& Mocerino (2008), Keles & Kefeli (2010) and Patel (2013), who reported that the use of Diagnostic Strategyand Computer Assisted Instructional Programme for Remedial Teachingwas more effective in improving the students' Achievement and Retention than the Conventional Teaching.

Also Cognitive Style was found to influence significantly the Achievement in Science in favour of Field Independent students when groups were matched with respect to Pre-Achievement in Science. This finding is supported by Bagchi (2004); Tsaparlis (2005) and Dupe (2014) who reported that Cognitive Styles were significantly related to overall Achievement in Science and Field Independent students scored higher than Field Dependent students. Further the reason of this might be the analytical capacity of Field Independent students, who can perceive the separate elements of a general pattern and analyze the pattern from different perspectives. In contrast, Field Dependent perceives a pattern without separating its elements. They can only understand one aspect of a concept. Luk (1998) has also emphasized that Field Independent students are generally expected to perform better academically than those who are Field Dependent, and this is particularly marked in situations, where students learn without the traditional support offered in conventional instruction. It is well known that Achievement in Science requires analytical thinking on the part of students, so Cognitive Style and Achievement in Science do have some common attributes.

Although DTRLS has been effective with both Cognitive Groups, but Field Independent students showed much greater Achievement level than Field Dependent students. For wider applicability of DTRLS further examination of how information is delivered and processed needs to be undertaken in order to ensure that students of various Cognitive Learning Styles receive the full benefits of the program. Furthermore, DTRLS may prove to be more advantageous for Field Dependent students with provision of conventional structure added to the Remedial Teaching.

Conclusion

The system can be used for reducing the burden of diagnostic and formative assessments from an overloaded teacher, to supplement the

regular teaching work, to reduce the misconceptions and learning gaps of students and to provide remediation for individual learning.

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ICT Skills to Enhance the Effectiveness of Teachers

Haseen Taj[1] & B.G.Bhaskar[2]

[1] Professor & [2] Research Scholar

Department of Education, Bangalore University, Bangalore.

Email: htaj001@gmail.com

Abstract

Globalization and technological change processes that have accelerated in tandem over the past few years have created a new global economy "powered by technology, fueled by information and driven by knowledge." The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. As the half-life of information continues to shrink and access to information continues to grow exponentially, schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, schools must promote "learning to learn," i.e., the acquisition of knowledge and skills that make possible continuous learning over the lifetime. "The illiterate of the 21st century," according to futurist Alvin Toffler," will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn."

ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony.

Today's classroom teachers must be prepared to provide technology-supported learning opportunities for their students. Being prepared to use technology and knowing how that technology can support student learning must become integral skills in every teacher's professional repertoire.

Teachers must be prepared to empower students with the advantages technology can bring. Schools and classrooms, both real and virtual, must have teachers being equipped with technology resources and skills and can effectively teach the necessary subject matter content while incorporating technology concepts and skills. Real-world connections, primary source material, and sophisticated data-gathering and analysis tools are only a few of the resources that enable teachers to provide heretofore-unimaginable opportunities for conceptual understanding.

Introduction

Globalization and technological change processes that have accelerated in tandem over the past few years have created a new global economy "powered by technology, fueled by information and driven by knowledge." The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. As the half-life of information continues to shrink and access to information continues to grow exponentially, schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, schools must promote "learning to learn," i.e., the acquisition of knowledge and skills that make possible continuous learning over the lifetime. "The illiterate of the 21st century," according to futurist Alvin Toffler," will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn."

Concerns over educational relevance and quality coexist with the imperative of expanding educational opportunities to those made most vulnerable by globalization—developing countries in general; low-income groups, girls and women, and low-skilled workers in particular. Global changes also put pressure on all groups to constantly acquire and apply new skills. The International Labour Organization defines the requirements for education and training in the new global economy simply as "Basic Education for All", "Core Work Skills for All" and "Lifelong Learning for All". Information and communication technologies (ICTs)—which include radio and television, as well as newer digital technologies such as computers and the Internet—have been touted as potentially powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education

to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life.

However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICTs is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology—indeed, given enough initial capital, getting the technology is the easiest part!—but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others.

The Promise of ICTs in Education

For developing countries ICTs have the potential for increasing access to and improving the relevance and quality of education. It thus represents a potentially equalizing strategy for developing countries.

[ICTs] greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, is their sense of isolation. The new communications technologies promise to reduce that sense of isolation, and to open access to knowledge in ways unimaginable not long ago.

However, the reality of the Digital Divide—the gap between those who have access to and control of technology and those who do not—means that the introduction and integration of ICTs at different levels and in various types of education will be a most challenging undertaking. Thus failure to meet the challenge would mean a further widening of the knowledge gap and the deepening of existing economic and social inequalities.

What are ICTs and what types of ICTs are commonly used in Education?

ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies

include computers, the Internet, broadcasting technologies (radio and television), and telephony.

In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of computers and the Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.

Moreover, different technologies are typically used in combination rather than as the sole delivery mechanism. For instance, the Kothmale Community Radio Internet uses both radio broadcasts and computer and Internet technologies to facilitate the sharing of information and provide educational opportunities in a rural community in Sri Lanka. The Open University of the United Kingdom (UKOU), established in 1969 as the first educational institution in the world wholly dedicated to open and distance learning, still relies heavily on print-based materials supplemented by radio, television and, in recent years, online programming. Similarly, the Indira Gandhi National Open University in India combines the use of print, recorded audio and video, broadcast radio and television, and audio conferencing technologies.

How can ICTs help expand access to Education?

ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enrol on campus.

- **Anytime, Anywhere***:* One defining feature of ICTs is their ability to transcend time and space. ICTs make possible a synchronous learning, or learning characterized by a time lag between the

delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).

- **Access to Remote Learning Resources:** Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons— mentors, experts, researchers, professionals, business leaders, and peers—all over the world.

How does the use of ICTs help prepare individuals for the workplace?

One of the most commonly cited reasons for using ICTs in the classroom has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the Internet and related technologies, are becoming more and more ubiquitous. Technological literacy, or the ability to use ICTs effectively and efficiently, is thus seen as representing a competitive edge in increasingly globalizing job market. Technological literacy, however, is not the only skill, well-paying jobs in the new global economy will require? EnGauge of the North Central Regional Educational Laboratory (U.S.) has identified what it calls "21st Century Skills," which include digital age literacy (consisting of functional literacy, visual literacy, scientific literacy, technological literacy, information literacy, cultural literacy, and global awareness), inventive thinking, higher-order thinking and sound reasoning, effective communication, and high productivity. The potential of ICTs to promote the acquisition

of these skills is tied to its use as a tool for raising educational quality, including promoting the shift to a learner-centered environment.

The Uses of ICTs in Education

Education policy makers and planners must first of all be clear about what educational outcomes are being targeted. These broad goals should guide the choice of technologies to be used and their modalities of use.

The potential of each technology varies according to how it is used. Haddad and Draxler identify at least five levels of technology use in education: presentation, demonstration, drill and practice, interaction, and collaboration.

Each of the different ICTs—print, audio/video cassettes, radio and TV broadcasts, computers or the Internet—may be used for presentation and demonstration, the most basic of the five levels. Except for video technologies, drill and practice may likewise be performed using the whole range of technologies. On the other hand, networked computers and the Internet are the ICTs that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration.

Issues in the Use of ICTs in Education

Effectiveness, cost, equity, and sustainability are four broad intertwined issues which must be addressed when considering the overall impact of the use of ICTs in education.

Does ICT-enhanced Learning really work?

The educational effectiveness of ICTs depends on how they are used and for what purpose. And like any other educational tool or mode of educational delivery, ICTs do not work for everyone, everywhere in the same way.

Enhancing Access: It is difficult to quantify the degree to which ICTs have helped expand access to basic education since most of the interventions for this purpose have been small-scale and under-reported. One exception is the television-based project Telesecundaria, which in 1997-98 was serving over 750,000 junior secondary students in 12,000 centers in Mexico. In Asia and Africa, assessments of distance learning projects at the junior secondary level using a combination of print, taped, and broadcast technologies have been less conclusive, while at the primary level there is little evidence that ICT-

based models have thrived. In higher education and adult training, there is some evidence that educational opportunities are being opened to individuals and groups who are constrained from attending traditional universities. Each of the 11 so-called mega-universities, the biggest and most well-established open and distance institutions in the world (which include the Open University of the United Kingdom, the Indira Gandhi National Open University of India, the China TV University System, the Universities Terbuka of Indonesia, and the University of South Africa, among others) has an annual enrolment of more than 100,000, and together they serve approximately 2.8 million. Compare that with the 14 million combined enrolments of the 3,500 colleges and universities in the United States.

Raising Quality: The impact of educational radio and television broadcasts on the quality of basic education remains an under-researched area, but what little research there is suggests that these interventions are as effective as traditional classroom instruction. There have also been many studies that seem to support the claim that the use of computers enhances and amplifies existing curricula, as measured through standardized testing. Specifically, research shows that the use of computers as tutors, for drill and practice, and for instructional delivery, combined with traditional instruction, results in increases in learning in the traditional curriculum and basic skills areas, as well as higher test scores in some subjects compared to traditional instruction alone. Students also learn more quickly, demonstrate greater retention, and are better motivated to learn when they work with computers. Research likewise suggests that the use of computers, the Internet, and related technologies, given adequate teacher training and support, can indeed facilitate the transformation of the learning environment into a learner-centered one.

Key Challenges in Integrating ICTs in Education

Although valuable lessons may be learned from best practices around the world, there is no one formula for determining the optimal level of ICT integration in the educational system. Significant challenges that policymakers and planners, educators, education administrators, and other stakeholders need to consider include; *educational policy and planning, infrastructure, language and content, capacity building, and financing.*

ICT Competencies for Teachers

Achieve Universal Primary Education is one of the main development objectives. The Dakar Framework of Action for Education for All (EFA), adopted in 2000 as a roadmap to meet the Education for All goals by 2015, highlights the role that, and Information and communication technologies (ICT) has to support EFA goals at an affordable cost. ICTs have great potential for knowledge dissemination, effective learning and the development of more efficient education services.

ICT can also help to accelerate teacher training as the world faces an acute and growing shortage of teachers with currently,60 million teachers round the globe, but another 15-35 million needed to achieve Education for All by 2015.However, effective integration of emerging ICTs in traditional education models is impeded by many factors. A key retardation factor relates to the lack of proper ICT competencies on the part of teachers.

Today's classroom teachers must be prepared to provide technology-supported learning opportunities for their students. Being prepared to use technology and knowing how that technology can support student learning must become integral skills in every teacher's professional repertoire.

Teachers must be prepared to empower students with the advantages technology can bring. Schools and classrooms, both real and virtual, must have teachers being equipped with technology resources and skills and can effectively teach the necessary subject matter content while incorporating technology concepts and skills. Real-world connections, primary source material, and sophisticated data-gathering and analysis tools are only a few of the resources that enable teachers to provide heretofore-unimaginable opportunities for conceptual understanding.

Traditional educational practices no longer provide prospective teachers with all the necessary skills for teaching students, who must be able to survive economically in today's workplace. Teachers must teach students to apply strategies for solving problems and to use appropriate tools for learning, collaborating and communicating.The problem is not necessarily lack of funds, but lack of adequate training and lack of understanding of how computers can be used to enrich the learning experience.

Conclusion

The rapid growth and development of new information and communication technologies (ICT) in the last few years have opened new opportunities for people all over the world. The development of ICT has been pervasive, affecting national economies, social policies, culture and our everyday life. ICTs are changing the way people communicate, work and interact with each other. ICTs have the potential to improve people's lives by increasing capacities to share and access information and knowledge. They have produced significant transformations in industry, agriculture, medicine, business, engineering and other fields. They also have the potential to transform the nature of education-where and how learning takes place and the roles of students and Teachers in the learning process. Teacher education institutions may either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological change. For education to reap the full benefits of ICTs in learning, it is essential that pre-service and in-service teachers have basic ICT skills and competencies. Teacher education institutions and programmes must provide the leadership for pre-service and in-service teachers and model the new pedagogues and tools for learning.

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Mnemonic Strategies: Helping Students Remember Important Information

Jeffrey P. Bakken,

Associate Provost for Research and Dean

Graduate School, Bradley University

Email: jbakken@fsmail.bradley.edu

Abstract

The ability to remember new and unfamiliar material is very important for the success all students. As students move through the different grade levels new information is transferred to them and the types of content presented is often more complex. Mnemonic strategies have been proven to help students recall information by making it easier to remember, more meaningful, and more concrete. Mnemonic strategies are an effective study tool which can be utilized with all students and applied to an array of content areas.   This manuscript will present a variety of mnemonic strategies that can be very useful when working with students to improve their vocabulary knowledge.

Introduction

Mnemonic instruction is a way to help students remember new information more effectively, efficiently and easily. It involves linking unfamiliar content information with familiar already known information through the use of a visual picture or letter/word combination. The use of mnemonic instruction helps students learn unfamiliar content more easly. "Mnemonics are effective when they speed up learning, reduce confusion among similar items, and enhance long-term retention and application of the information." (Shmidman, &Ehri, 2010, p. 160).

The keyword method is a mnemonic (memory-enhancing) technique used to increase the initial learning and retention of facts which students often encounter in schools. This method incorporates both auditory and visual cues to enhance meaningfulness of the information to be learned and to promote strong associations between questions and answers (Mastropieri, 1988). The keyword, pegword, and reconstructive elaboration mnemonic strategies have proven effective

across many studies and have shown effective for middle school and high school age students with learning disabilities (Wolgemuth, Cobb, &Alwell,, 2008). In addition, "mnemonic devices, such as acrostics, acronyms, narratives, and rhymes, can assist in making abstract material and concepts more meaningful for individuals" (Laing, 2010, p. 349).

Research History of Mnemonic Strategies

Mnemonic strategies are systematic procedures for enhancing the memory and making information more meaningful. Although there many different retrieval strategies that can be implemented to attempt to retrieve forgotten information, research has demonstrated that the way information is initially encoded facilitates memory and the recall of this information better. The fundamental aspect in developing mnemonic strategies is to find a way to relate new information to information that is already in the long-term memory of students. If this connection can be made, the memory of this information has the potential of being remembered for a very long time.

Mnemonics instruction with school age students is commonly implemented as an instructional strategy for teaching word recognition and vocabulary. The effectiveness of the use of these strategies is well documented. Research shows that students, including secondary and college level, remember 2 to 3 times as much factual information, maintain information over delayed recall periods, and enjoy using them. Other research findings "provide evidence that instruction involving the use of mnemonic devices does enhance a student's formal reasoning skills and that this has the potential for application of knowledge to more varied tasks" (Laing, 2010, p.354). In addition, "the use of mnemonics with college age students might have enough potential for making learning easier and possibly more fun" (Higbee, 1994, p. 11).

It may also be helpful to mention what mnemonic strategies are not. Mnemonic strategies do not represent a "philosophy" of education. Mnemonic strategies should be implemented for only one reason: to help people remember to-be-learned information. Mnemonic strategies are also not an overall teaching method or curricular approach. The focus of mnemonic strategies is so specific that they are intended to be implemented to enhance the recall of the components of any lesson for which memory is needed. These strategies are also not comprehension strategies, but strategies to aid the recall of new information. It should

be noted that students who are trained mnemonically also perform better on comprehension tests of that specific content (e.g., Mastropieri, Scruggs, & Fulk, 1990; Scruggs, Mastropieri, McLoone, Levin, & Morrison, 1987), but that is generally because the implementation of the mnemonic strategies helps them remember more information that can be applied on comprehension tests. Finally, it should be emphasized that mnemonic strategies are not the "cure all" for success in school.

Mnemonic Strategies

Acrostics

Acrostics are a sentence that is developed to help the person retrieve letters. These letters then represent something that the person needs to remember. The sentence is a (catchy) way to make the information more meaningful and easier to remember. For example:

Every Good Boy Deserves Fudge

This example helps an individual remember the lines of the treble clef (e, g, b, d, and f).

Another example of the use of acrostics is:

My Very Educated Mother Just Served Us Nine Pizzas

This particular example helps the person remember the order of the planets of the solar system (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto). It must be noted that students must first know the vocabulary for the strategy to be effective. For example, if a student does not already know the names of the planets, the acrostic will be of no help to them in remembering their order.

Acronyms

Another popular form of mnemonics is the use of acronyms. Acronyms are words that are developed from the first letter of words that are to be remembered. The following examples demonstrate use of acronyms:

To remember the Great Lakes the acronym HOMES could be used:

Huron, **O**ntario, **M**ichigan, **E**rie, **S**uperior

Another example would be the use of the acronym ROY G BIV to remember the colors of a rainbow:

Red, **O**range, **Y**ellow, **G**reen, **B**lue, **I**ndigo, **V**iolet

It must be noted that students must first know the vocabulary for the strategy to be effective. If a student does not already know the names

of the Great Lakes, the acronym will be of no help to them when recalling the information. Also, students need to be taught how to use the process. If they are not taught how to use the acronym to assist them in studying, they will not be able to recall the information. For example, it is very common for students to respond to the question, "What are the five Great Lakes?" with the answer HOMES. In this case, the student has not been instructed properly in linking the acronym to the information being recalled. The student recalls simply the acronym without understanding the content. The acronym cannot just be presented to the students or posted in the classroom. Students must be taught how to effectively use the acronym and practice using it so they can implement it independently.

Keyword Method

The keyword method is a technique (form of mnemonics) commonly used to learn vocabulary words. It takes unfamiliar information and makes it more meaningful and concrete and thus, easier to remember. When developing a keyword strategy you should follow the 3 R's: reconstructing, relating, and retrieve (Mastropieri, 1988). The use of the 3R's is as follows:

(1) Reconstructing: Coming up with a keyword. Something that is familiar to the student, easily pictured, and acoustically similar (sounds like the word to be learned);

(2) Relating: Next, link the keyword with the definition of the new word in a picture; and

(3) Retrieve: Lastly, teach the learner the process of how to effectively go through the steps to remember the new vocabulary word and meaning.

An example of the use of this strategy can be seen when teaching the word peavey and its meaning, hook (Mastropieri, 1988). The word peavy means hook.

Develop keyword-Pea—it is familiar to students, acoustically similar to peavy and can be easily pictured.

Develop a picture of a peaon the end of a hook linking the keyword and the definition of the word.

Teach the process: "When I say what does peavy, first think of the keyword pea (peavy-pea), then what was happening with the pea, the pea was on the end of a hook, then the answer-hook."

It is very important to not forget to teach the students the process of how to remember and recall the needed information (Step 3). Just developing and showing students mnemonic pictures will not improve their recall of vocabulary knowledge.

Reconstructive Elaborations

Reconstructive elaborations are mnemonic strategies implemented when content area learning is presented. It involves students learning information taken from a content area textbook that they need to remember. There are four types of reconstructive elaborations: symbolic, mimetic, acoustic, and the first letter strategy (Mastropieri& Scruggs, 1989; Mastropieri, Scruggs, Whittaker, & Bakken, 1994). The definition and an example of each type of reconstructive elaboration is as follows:

(1) *Symbolic-*The concept the student needs to know is an abstract concept, but familiar (1st US Policy) to the student. A symbol is used to represent something to help the student remember. Example: Uncle Sam representing the US and their stance in the war.

(2) *Mimetic-*Student knows the word, but not meaning or the meaning is inaccurate. An example is trenches: Student is familiar with the word, but not meaning. Student is shown a picture of a trench with soldiers in it getting sick and dying.

(3) *Acoustic-*The word to be learned is a totally unfamiliar word and the student does not know the definition (same as keyword). Since the information was specifically related to content area information a new term was developed (acoustic).

(4) *First Letter-*A combination of Acronym and Key Word strategies. For example, imagine a picture of an Allied van on fire with a person saying FIRE! Teacher asks what are the Allied Powers? Student thinks of keyword-Allied Van. What is happening with the Allied Van? The van is on fire. What does FIRE stand for? France, Italy, Russia, and England. Those are your answers. The picture and mnemonic methods alone will not be as beneficial to your students as teaching them the process of remembering the pictures and how to retrieve the important to-be-learned information (Scruggs &Mastropieri, 1989).

Double Keyword Method

Sometimes there is related information that students need to know, but

all the information is unfamiliar to them. In that case, a double keyword strategy might be implemented. This might be used when a person has to be able to go forwards or backwards to recall information (Mastropieri, Scruggs, Bakken, & Brigham, 1992). Remembering the states and their capitals would be an example where students might not know the name of a state or its capital. An example for recalling states and their capitals would be as follows: A teacher could ask "what is the capital of Wisconsin? or, Madison is the capital of what state?" In this example, the student would need to be able to go in either direction to recall the needed information. An example of how this technique might be taught is as follows:

Teacher: The keyword for Wisconsin is whisk broom and the keyword for Madison is maid.

Teacher Asks: What is the capital of Wisconsin?

Teacher Instructs Students: First, think of the keyword for Wisconsin (whisk broom), then look at what is happening in the picture (a maid is cleaning with a whisk broom), and finally your answer-Madison. The teacher could also go in the other direction by asking Madison is the capital of what state? In this case the student would first need to think of the keyword for Madison (maid), then what was happening in the picture (a maid is cleaning with a whisk broom), and finally your answer-Wisconsin.

This is another method to help students with and without disabilities learn information.

Study Skills and Students

Once information is identified where mnemonic strategies would be beneficial, the learner must evaluate the use of mnemonics as a means to support study skills. Students are encouraged to work with their teacher to develop strategies that can assist with learning the content. An effective way to assist students in the use of mnemonics is to implement a team approach in developing the best strategies for the learner. The more individuals involved in the process will help in developing more ideas. During team meetings, brainstorming is an effective technique. This technique can be implemented so that there are many options to consider from many different people and each choice can be evaluated as to which might be the most effective. If there is not a good choice skip it and come back to it later. The young adult learner should be involved in the planning process and the team

should look directly at the content that needs to be learned. Often, student participation will enhance the meaningfulness of mnemonics use.

Conclusion

A difficult task for many is to remember new, difficult or uninteresting material. This is very common for many different kinds of students. Learners are required to learn more information and more complex content. Mnemonic strategies have been proven to help individuals remember information by making it easier to remember and more concrete. These strategies work with all kinds of students and it can be applied to any type of content. Although mnemonic strategies can be very beneficial, it is important to choose the correct method or it will not benefit the learner.

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Character Education in the Era of E-Learning: A Roadmap for Preparing Teachers

Sushil Kumar Tiwari[1] & Aejaz Masih[2]

[1] Research Scholar & [2] Professor

Department of Educational Studies,

Faculty of Education, Jamia Millia Islamia, New Delhi 110025

Email: education.sushil@gmail.com & amasih@jmi.ac.in

Abstract

Present paper pleads the need for preparing teachers as character educators along with the capability to educate with the help of digital resources in the era of e-learning. Paper cites the evidences collected through the interviews with religious scholars and educationists related to the field of character education. As many as 25 interviews were conducted with the help of semi structured items largely focussing on character and its relationship with education, religion, culture etc. The data discloses that there is a profound impact of the religious and spiritual beliefs and practices on character education to build character among the students. There may be other sources but the raw data of interviews are inclined to religious sources in Indian context, hence paper is confined particularly to discuss character, religion as source and its relationship with spirituality. Spirituality has been discussed with and without the effect of religious beliefs putting respondent view in this regard. Paper basically attempts to answer whether it is practicable to prepare teachers who can propagate these infused practices of character building through e-learning. Moreover, the teacher preparatory programmes should be able to produce the teachers as character educators who are efficient to sensitize the dual nature, i.e. physical and spiritual nature of human beings with the help of e-learning technology. A model has been proposed for such programme at the end of the paper.

Key-words: *character educators, digital resources, e-learning, teacher preparatory programmes, physical and spiritual nature*

What is Character?

On many occasions, we use character as umbrella term and in practice also, we discuss the character, intermingled with all the related terms such as, value, morality and ethics. It is originated from the Greek word *'charassein'* which means *to scratch* or *to engrave*. Hillman (2000), in book 'The Force of Character' defines character as an "invisible source of consistency" and "deep structures of personality that are particularly resistant to change. It is not confined to the individual behavior and habits but sometimes it is also as character of the group, community or class.

Value has many definitions and one is, "Values can be defined as learned, relatively enduring, emotionally charged, epistemologically grounded and represented moral conceptualizations that assist us in making judgments and in preparing us to act....................This usage of the concept is inclusive of the personal values of an individual as well as the collective values of a community." (Frey, 1994) Now, how character and value are interlinked? "James Hunter (2000, p. 225) makes the observation that the problem is that character cannot develop out of values….." (Arthur, 2014) Thus, it is evident that if we are talking about character and character education the term itself is value laden. Similarly, morality and ethics are interrelated with character. Morality is defined as, "It deals with humans and how they relate to others and the world around them. It deals with how we treat one another so as to promote what is good and right" ("Chapter 1 - What Is Morality□ ? GeneralOverview□ : Class Suggestions",n.d.). The French philosopher Jean-Pierre Dupuy explained, "ethics stands for the effort to force everything into universal harmonized principles" (Gammel, n.d.).

Data emerged from the interviews are quite similar as discussed above and in general the respondents intermingled the terms and also reiterated their interrelationship when asked. According to one of the respondents, character is defined as, "It is moral and ethical aspect of personality and a personal attribute of the individual which determines the type of personality an individual has." Along with psychological aspect of personality the interconnection between the three terms are visible in the definition. On the interrelationship with other terms, another respondent argued and said, "As I said character is a commitment to the well settled principles, morals, and values of our society. So all are interrelated and character is something to be formed

and maintained particularly but in general, the two others are set principles and norms are given and evaluated by the society." Almost all respondents agreed that the three terms; value, morality and character have strong linkages and in general, we use the term interchangeably for sharing perspectives and common goals. In the present paper also, we are taking character as an umbrella term.

Religion as a source for Developing Character

As per the Stanford encyclopedia of philosophy (2014), "The origin of the word is probably the Latin '*religare*', to bind back." It is quite clear and as acclaimed also that there is a strong linkage between the character and religion. Whether eastern or western; all are involved in certain ways of belief and practices which amalgamated to form their religion. The ultimate nature and the imprinted product of religions is character. Here are some evidences to say this. One of the respondents said that, "Character is '*shudha acharan*' (good conduct). Thus, character is making life valuable and leading an appropriate life by following the behaviours and principles defined by *Vedshashtra* (Hindu's Scriptures) and not making the life valueless."

Another respondent has similar view, "In Urdu character is known as '*akhlaq*' (*or kirdar).* How a man behaves with others, showing good manners to other people; not only with Muslims but with all individuals irrespective of religions…..Actually living a life based on Islamic principles and as defined by *Shariyat* is said to be proper and good." There were similar responses for other religions also. Now, we can say that religion is one of the best sources for character building.

'Spiritual' but not 'Religious'

Scholars believe that as living a life of spirituality means the 'spirit' connected with some kind of energy; may be God but not following any faith or religion. The 'spirit' is the word which leads to the word spirituality. The meaning of spirit as defined by Merriam Webster dictionary as, 'the force within a person that is believed to give the body life, energy and power' or 'the inner quality' or 'nature of a person' or 'a person'. In this way, spirituality includes the beliefs and practices concerned to the life, energy and power to build the nature or character if imprinted so.

One of the respondents viewed like, "They (her countrymen as she is not from India) lack religion. They live a life of fun but not the life of God." When I asked that *do you mean that they don't believe in God*?

Then her response was, "No, they believe in God. They are more spiritual than religious." On further clarifications, she reiterated as, "They believe in something out there as 'energy' and there is a connection. They believe in *reiki,* they believe in *yoga."*

Discussing the spirituality and relationship with religion Andrei (2010) said that, "In a nutshell, **spirituality deals with issues of inner beliefs and feelings**, and is closely associated with religion and philosophy……..By non-religious spirituality, people generally mean a spirituality in which **a person is** *not* **guided by the framework of a particular religion/belief-system**." Being very particular, in this paper character may also be linked to the spiritualism not guided by a religion.

Spirituality with Religion

One respondent's viewed that spiritualism without religious behavior is just like ignoring the handrail of stair. She also argued as, "There is no base if they (her countrymen who practice spirituality but not religion) believe in energy. You believe in scriptures and something is there that you say something has given us life but who has given life, nobody could answer exactly. They don't put this on priority to be connected with God." Thus, for many people Religion is the ground where the spiritual nature develops.

Dual nature of Human Beings

We discussed about spirituality but two different types of nature exist: **physical nature** and **spiritual nature**. Similarly, there are tendencies as 'good' and 'bad'. As far as spiritual nature is concerned God is believed to be the 'Creator of human beings' (or a kind of energy as supreme power). This belief leads to positive aspects of character and on the other hands physical nature may be linked to the desire to fulfil physical needs and thus more prone to negative aspects of character. The western concept is there to live a quality life based on scientific and technological advancement but Islamic philosophy emphasizes the spiritual development is the basis of quality life.

(Source: Retrieved on 30/09/2016, http://www.ukm.my/jiae/pdf/16.pdf)

Interface between Physical and Spiritual nature of human beings

A human being is combination of both: 'body' and 'soul'; i.e. 'physical' and 'spiritual' nature respectively. As a human being, one cannot deny the development of both. Eastern philosophies, like in

Hinduism, scholars reiterate for the development of 'body' and 'spirit' and 'self realization' is the knowledge of 'body', 'mind' and 'soul'. (Source: Retrieved on 30/09/2016, http://www.yogananda-srf.org/glossary/Glossary_R_%E2%80%93_S.aspx#.V-4rjo997IV) The holistic development carried out through education basically combines both and the ultimate goal of education is 'self realization'.

Interaction of E-Learning with Dual Nature of Human Being

E-learning can be defined as the formal teaching with the help of E-resources. As explained, "E-learning involves various technologies (e.g., cable TV, the Internet, or palm-held computers), various forms (e.g., virtual learning, online learning, distance learning, and Web-based learning), and various components (e.g., e-book, e-dictionary, e-library, e-classroom, e-assessment, e-homework, and e-management)" (Yan, Hao, Hobs, & Wen, 2003).

Digital advancement is essential component for sensitizing 'body' and 'mind' and fulfilling the physical needs it may be categorized as the tool to satisfy physical needs. But, the ignorance of development of 'spiritual nature' may lead to one sided character development. Thus it is mandatory for the teacher to sensitize the 'spiritual nature' also through e-learning. For holistic development interaction of e- learning with dual nature of human being should be the virtue of e-classroom.

Preparing Teachers as Character Educators for E-classroom

Comparing to the earlier classroom education, e-learning is much more beneficial to learners. During the e-learning process, students get the chance to learn at their own pace and even to what extent and duration as well. Thus, e-learning process is a student-centered approach. An effective e-learning system specified with learning objectives, curriculum, transaction and strategy enhances individual skills. E-learning facilitates learners to plan and direct their own learning process, thus it makes the student responsible for self learning. The most important is the forums, created within by the teachers; provide students a democratic and discussion environment where the problems can be solved cooperatively through interactions. This type of interaction is not only two-way but in one manner it is multiple-way if chats are freely accessible to all other learners on public forum.

Thus, the virtue of cooperation and interaction can be developed and further linked to the social issues, religious strengths without being

biased to any faith and spiritual strategies with outcomes on these forums.

Other applications with the related software can be carried out to perform many tasks easily. Future teacher should have the capability to be efficient in these applications like, **E-examination** to assess the level of students with the help of internet online test and evaluations, **E-Drills** to create an effective and conducive studying environment for example using multimedia software and reinforce on numerous examples; **E-Book and E-Television** to enable learners to access the books and TV programs through Internet, **E-Counseling** To enable future teachers for counseling to be provided to the students through the Internet, **E-Sound Book** to enables for the visually retarded learners to listen to the course book material, and others to be capable for e-classroom in future in true sense.

We may understand that it is a learning experience that sensitizes, even in the e-learning environment, to think, feel, question, reflect, criticise, judge, care and act, and not an exercise or prescription only for personal peace, tranquillity and happiness programme for the prospective teachers.

We may take on example, as the democratic practice in classroom can be done through a student self government activity effectively for character education. Thus to make future teachers enable to conduct these programmes in future they should also be involved in the practice of character education and spiritual development based activities; like yoga, meditation, reiki, along with sense of cooperation between them. Along with being efficient in running these softwares it is a big task for the teacher educators and academicians involved in teacher preparatory programmes to sensitize the dual nature and to build the character in Indian classrooms. If our preparatory programmes can prepare character educators with the ability to sensitize dual nature in e-classroom then only the purpose of e-learning is fruitful; catering not only technological, scientific or physical needs but also spiritual needs for comprehensive character building.

Following *MODEL,* discussing components infused in teacher preparatory programmes has been proposed:

VISION
•   Programme will prepare future teachers who will be able to use digital resources and make collaborative forums on website publically to interact with masses; regarding the character building related to religious and spiritual strengths of all faiths of

society along with subject content knowledge through the forums
- E-learning would not be confined to personal assistance through CD, TV etc., but they will Assist all students based on justice, humanity, democratic principles and transparency whoever will be in need irrespective of narrow boundaries of self institutions i.e. beyond the boundaries of schools
- Future teachers would be able to guide for quality life and development of body, mind and spirit through the online and offline assistance in all areas, thus to Implement E-learning to solve the purpose of life comprehensively

OBJECTIVES
- To prepare teachers who are capable to teach through electronic resources like cable TV, Internet, E mails or palm-held computers not only for academic achievement but also supporting the programmes or slides on; or reinforcing students on the cooperation, colaborations, group behaviour, democratic attitude and other prosocial behaviours
- To enable them to be efficient in various forms of e-learning along with in the development of caring school community, spiritual nature with physical one; beyond classroom (e.g., virtual learning, online learning, distance learning, and web-based learning), and various components (e.g., e-book, e-dictionary, e-library, e-classroom, e-assessment, e-homework, and e-management

CURRICULUM
- Foundation of education i.e. general curriculum of teacher education at present with foundation of character: It means with the general curriculum the forum should have regular interaction and exercise in relation to:-
- 1) Value / Moral Dilemmas for Discussions 2) Problems pertaining to women's role and education 3) Caring animals and human beings 4) Problems related to environmental protection 5) Consequences of air water pollution 6) Valuing spiritual discourse like Yoga, Meditation, Reilki and other mental piece provoking programmes with flexibility on time and availability
- Society and education with core values like justice, equality, compassion, co-operation, human rights etc. for pluralistic society
- Educational technology with ethical issues of use and misuse
- School internship with community service programmes in the locale of school

TRANSACTION
- Use of digital resources: online and offline colaborations and interactions
- Raising the issues, challenges, conflicts and citing examples of character building or degradation of values; from the real life, also from scriptures, religious and spiritual practices

STRATEGY
- Preparing character educators who will gain socialized strategies to be followed in future as given:
- a) Dramatization activities on social issues (like gender discrimination) based play, dramas, traditional folk, modern on character building themes, also related to spiritual development like dance mixed with yoga.
- b) Role playing method to take up and practice the role of different kinds, taking the role form epics/scriptures.
- c) Modelling exercise, the ideal persons and groups or themes
- Using audio (E sound books) and video (E-TV) both in regular mode or accommodating to include children with varied abilities.
- Arousing sense of feeling to give opportunity to handle the digital resources who does not respond frequently that will support them in future as character educators

The above given model is proposed to prepare teachers as character educators for e-classroom and in the era of e-learning. So, in this model the mode of instruction is somehow similar to e-learning and using the digital resources or electronic technology for the purpose.

Conclusion

E-learners in India needs a teacher who is technology enabled and the one who is facilitator of eternal values which are ingrained in Indian religious system and spiritual beliefs. For that purpose, we should try to develop the teachers who wish to fulfil the comprehensive needs and to sensitize the dual nature of students through E-learning. Children are not the numbers in school but they need to build the character to lead a life full of solace and inner peace. Thus, digital technology should solve the purpose of life, but not for the outer look and numbers. The model proposed is for better use of digital resources. We should welcome and hold the technological advancement firmly with both hands, propagating the infused character building beliefs and practices of Indian religious system in e-classroom.

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E-Learning Environments: Strengthening Inclusion in Schools

Vandana Saxena

Associate Professor, CIE, University of Delhi

Email:vsaxena69@gmail.com

Abstract

This article discusses the potential of e-learning environments for facilitating the process of inclusion in schools. It is acknowledged that school based discussions now have a pertinent focus on diversity across student's social and learning domains for the purpose of both administrative and pedagogical designs. While e-learning is an upcoming promising mode of deliberations in schools, a comprehensive understanding of its benefits for students with and without typical physical conditions is yet to be demonstratively understood. Along with the most advocated benefits of flexibility of space, time and pace associated with e-learning, it's appropriateness for students with/without apparent/invisible disability as also for teachers is yet to be established. It is convincingly proposed that the systemic design of accessible e-learning options be developed through a participatory design mechanism involving pedagogues, technology-experts, subject teachers, special educators and of course students with and without disability. These opportunities need to be appropriately designed to support accessibility both technologically and pedagogically with the purpose of creating enabling learning environments for each individual student.

Key Words*: E-learning, Inclusion, Peer collaboration and Enabling learning environment..*

When Diksha approached me for doing her research project, I was partly in doubt about whether we can realize it with each other. These were my early years as a teacher educator and Diksha was visually impaired. As a science student I never had a chance to interact withindividuals with physical impairment, they were not there in school. Additionally I was quite tuned to work through e-modes. I was unclear about Diksha's preferred work-styles. We talked with each

other. Her research idea appealed me in principle. Gradually, I got initiated into her world only to realize that her life was no different. Her work styles were no different. She just processed it differently. While discussing the research she reluctantly asked if she could record our discussion as this will provide her flexibility of time and place to comprehend the points of discussion. I promptly agreed to this. In fact since then even with my sighted scholars it became a regular practice. With recording the possibility of missing any critical part of discussion is nil and they could now focus more on academic part of discussion without worrying about taking notes. The e-modes provided both of us the space and flexibility of time and thought with each other though sometimes Diksha had problems accessing certain programmes and needed support of her peers in accomplishing the task. It was an mutually enriching experiences for all of us myself, Diksha and her peers. We learnt newer approach to work together and discovered the potential of e-learning environment for nurturing collaborative learning environment.

The above narrative is positioned to create the context for the discussion henceforth. It is tacitly agreed that the process of inclusion is meant for benefitting students with disability and the typically developing students have nothing much to gain from this process. Primarily, this assumption was challenged during this experience as the process was mutually beneficial. Next, the supposition that the teacher is well equipped to address the diverse needs of individual students merely through her initial training was challenged. The significance of continued experience in strengthening the pedagogical proficiency of teachers was established beyond any doubt. Furthermore the myth that what works with students with disability does not work with students without apparent disability, was demonstratively dismissed. The experience also helped each one of the participants in the process to recognize the efficient contribution of e-modes in accomplishing this task and enabled us with enhanced competence to work in inclusive set-ups.

With RTE in place the schools are gradually emerging as inclusive environments. Diversity across student's social and learning domains is better recognized in the school based discussions, both administratively and pedagogically. The matrix emerging as a confluence of this diversity along with evolving focus on e-learning environments has immense potential to create collaborative learning environments. *The*

fundamental principle of the inclusive school is that all children should learn together. Inclusive schools must recognize and respond to the diverse needs of their students, ensuring quality education to all through appropriate curricula, organizational arrangements, teaching strategies, resource use and partnerships with their communities (Saxena, 2012). E-learning environments thus have a potential to facilitate the process of inclusion in multiple ways. When designed and approached with a focus to support the learning process, these modes can be the most appropriate means to strengthen the process of inclusion.

Schooling is a social activity. Being a student is an enormously important social role, closely tied to a variety of transitions that take place throughout the course of life (Lefrancois, 2000). Early intervention is a commonly acceptable preposition in specific case of fostering a variety of thinking and process skills among individuals and thus a focus on school practices is imperative.

Most school systems are gradually becoming sensitive to the physical, social and cognitive accessibility challenges faced by the students with disability. The benefits of inclusion for students with disabilities have been the focus of discussion for long. *Although outcomes of inclusive education are inadequately understood for students with disabilities, even less data describe the outcomes of inclusive education on students without an identified disability* (Kurth, Lyon, & Shogren, 2015). These evolving scenarios, however, call for establishing inclusion more as a matter of context than place. The theoretical propositions such as *institutional access alone (the creation of physical space), does not answer the call for educational inclusion* (Sayed & Soudien 2003) and *what goes on in a place, not the location itself, is what makes a difference* (Zigmond, 2003), needs to be examined through pointed field studies.

In the area of inclusive education, the research and intervention studies principally focus upon the classroom processes, learning designs & resources and assessment adaptations. Given the somewhat recent push for e-learning, researchers have not had ample time, resources, or funding to examine how e-learning opportunities can be employed for enhancing students progress in inclusive classrooms.

 With e-learning as an upcoming promising mode of deliberations in schools a comprehensive understanding of its benefits for students with and without typical physical conditions is yet to be demonstratively

understood. *Clearly, the question of the degree of freedom and choice designed into devices is an issue for all users, but it may have particular significance for disabled users who use it as a substitute for basic human activities* (Seelman, 2001). Most prevalent e-learning options in schools are devices based which are used on a shared basis by a group of students. These scenarios thus have a potential to positively reinforce the peer interactions. *Everyone benefits when technological advances help those with disabilities become active participants in society. The level of disability acceptance a person with a disability has, affects whether he or she might embrace or reject many of the technological changes, but just the mere existence of the technology offers increasing possibilities for the future* (Karten, 2015).

E-learning is an effective mode for teachers to motivate and individualize learning while increasing their own classroom productivity. *One of the key benefits of e-learning is that learners can access education at almost any time from any location. Learners with disabilities welcome access to learning that is not only physically accessible but also incorporates UDL principles that can accommodate their unique learning needs* (Brokop, 2008). Teachers in an inclusive setting can, therefore, use technology to augment the curriculum, guiding and monitoring student's progress. *The use of digital documentation also allowed teachers to engage in a reflective process about their practice, leading them to review their pedagogical approaches and to move forward with the adoption of new instructional strategies aimed at meeting the specific needs of the diverse learners in their classroom* (Pellerin,2013).

It is expected that all the students including the students with apparent special needs will became more engaged in their learning and will display greater autonomy during e- learning activities. *Learning material that is made available online can have far more options for accessibility than analogue content, electronic text can be read aloud and translated to braille, audio files can be electronically transcribed as text. Finally the eLearning environment can provide students with a much greater degree of flexibility* (Kent, 2015). Consequently the teachers will be empowered to shift their pedagogical approach to a more student-centric approach. *The power of the World Wide Web to accommodate text, graphics, animation, video, audio and other simultaneous strands has the potential either to facilitate or to complicate Web site accessibility.* (Blasiotti, Westbrook & Kobayashi,

2001). Additionally, in the existing circumstances, most e-learning scenarios necessitate sharing of physical, material and human resources within a school. Hence for e-learning to be effective the self-motivation and preparedness of the students is significantly critical. *The concept of inclusion can also be understood from the social perspective. An understanding can be visualized in the education system when opportunity, accessibility and equality within education can be taken as a course of discussion* (Kumar, 2015). Thus developing positive interactions among all the students is one of the basic requirements for the effective and efficient learning through e-modes. This includes developing a sound understanding of role of each of them in collaborative learning environments. Peer-interaction between students with /without physical challenges is bound to pose unique challenges owing to intrinsic complexities due to multiple inter-personal issues associated herewith. In most obvious circumstances these relationships will not built routinely and needs to be nurtured through intended adult intervention based processes to create a culture of acceptance in a school wherein all the peer partners recognize contributions of peer with diverse physical conditions, experience personal benefits, develop new friendships and consequently a greater understanding of each other, accomplishing one of the primary goals of school education-finer social skills.

Within a school system the decisions about the education and placement of children with atypical physical conditions have resulted in a marginalized population that has been institutionalized yet often segregated, undervalued and socially unsolicited, not because of the impairment but because of the inability of the school to rethink its practices and overcome the systemic inertia. It is convincingly proposed that the systemic design of accessible e-learning options be developed through a participatory design involving pedagogues, technology-experts, subject teachers, special educators and of course students with and without disability. These opportunities need to be appropriately designed to support accessibility both technologically and pedagogically with the purpose of creating enabling learning environments for each individual student. E-learning opportunities, when appropriately designed, will empower the students with/without apparent/invisible disabilities to believe in each other and value each other's companionship. Conclusively these students will be enabled to think and plan inclusively in later years of their life.

Endnote: Multiple terms have been used here to refer to the students with and without physical impairment. This is not accidental but intentional with a purpose to disengage with the popular practice of placing unjustifiable thrust on taxonomy while the essential sophistication of thought has been maintained throughout the paper.

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Disposition of Teachers and Students towardsthe use of E-LearninginSchools.

Ilyas Husain[1]&Nisha Nair[2]

[1]Professor and Dean & [2]Ph.D. Scholar

[1]Faculty of Education, Jamia Millia Islamia

[2]Deptt. of Educational Studies, Jamia Millia Islamia, (Assistant Professor, Jindal Global Law School, O.P. Jindal Global University)

Email: ilyashusain2004@gmail.com

Abstract

The paper stresses on the need for adequate e-learning and technological training in the pre-service and in-service programmes for teachers. It aims to study the outlook and competency of teacher towards the use of technology and e-learning resources in teaching at secondary level of education. The paper looks at the ways in which teachers are inculcating e-learning material in the teaching learning process. The study considers the data collected from four secondary school of New Delhi, equipped with technologically enhanced learning facility, language labs and e-learning resources. The responses of teachers and students from four schools were randomly selected and recorded for analysis to gauge how e-learning resources are being used for teaching and learning and how is the perspective of teacher towards its usage affected by their level of training.

Key words: *Technology, e- learning, disposition of teachers, students, ICT, Pedagogy*

Globalization fueled by technological growth has made technology an important medium to connect with the rest of the world. Technology plays an important role in extending a learning enriched environment within and beyond the walls of classroom. The National Policy of Information Communication Technology (ICT) School in Education, 2012 which was rolled out with the vision of "preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socioeconomic development of the nation and global competitiveness". The policy identifies teachers as a key player in infusion of ICT related practices in the school education system. It emphasis on the need to orient teachers at both in-

service and pre-service level to acquire competency in facilitating ICT enabled education.

It is therefore important for teachers to be aware of the latest technologies or soft-wares available to enhance their pedagogy and its effectiveness. This calls for two important measures; first, providing adequate training and orientation to teachers at the pre-service or initial teacher education level, equipping them with the knowledge and skills required to use e-learning resources in the pedagogical processes, secondly, providing adequate training and support at both in-service and pre-service level; facilitating adequate access to web, hardware and software at institutional level and developing a positive outlook towards the use of technology by making it an intrinsic part of lesson planning and equipping schools with adequate infrastructure.

The National Council for Teacher Education (NCTE) took a significant decision and rolled out a policy which increased the duration of B.Ed. programme by another year making it a two year course from 2015 onwards. This also resulted in the re-structuring of the B.Ed. curriculum in Universities offering B.Ed. programmes across the country. It was believed that increasing the duration of the course would enhance the quality and output of teacher training institutions in the country. ICT is an essential component of B.Ed. curriculum to enrich teachers and students technologically and equip educational institutions in terms of rich and modern infrastructure to enable the access to web, digital devices and e-learning resources. It is expected that the pass outs of teacher education programmes would be prepared and equipped to integrate e learning in their teaching learning process at the later stage.

But apart from training the teachers and the students for the effective use of technology, it is equally important to develop in them a positive outlook towards its use.

Hence a study has been conducted on teachers and students of private schools to study their disposition towards the use of e learning with following objectives:

- to study the various components of e-learning being used by the teachers,
- to study the various components of e-learning being used by the students

- to study the level of preparation (training) for the use of e-learning for teacher
- to study the ultimate disposition of teachers and students towards the use of e- learning

Methodology and Sampling

The present study is qualitative in nature where in four private Secondary schools were chosen through non-probability sampling and forty students of standard IX and X respectively from each of these school were chosen through random sampling technique. The sample size included one hundred and sixty students and twenty teachers from the four schools.

The study focused on gauging the means and methods being used by teachers for the inculcating technology and e-learning in their teaching practices and to study their disposition towards the use of e-learning in teaching at secondary school level. To probe the issue further responses of students were also recorded and analysed.

Tools

An interview schedule and questionnaire for teachers and students respectively were developed by the researcher. This self-made interview schedule contained fifteen open-ended questions meant to be answered by the teachers teaching in classes IX and X. The purpose of this interview schedule was to probe the means and methods employed by teachers in using e-learning sources in the teaching process at secondary school level.

The researcher prepared questionnaires consisting 20 interlinked questionnaire administered on the both teachers and students to note the responses of the teachers regarding their knowledge of and comfort with using technological aids and e-learning sources while teaching; whether they have any formal training in using such sources.

What kind of the guidance and support teachers expect to be able to successfully use technology while teaching. The questionnaire for students focused on gauging how students experience and respond to the usage of e-learning and what is the frequency of its usage in the teaching-learning process.

The data thus collected through the questionnaire and interview schedule for teachers was compiled item wise and analysed through frequency tabulation and percentage analysis.

Analysis and Interpretation

The analysis of data and interpretation of teachers' and students' responses are as follows:

Table 1: Means and methods used for e-learning by Teachers

Particulars	Category	Percentage
Means of Using e-learning	Smart Class	40%
	PPT	60%
	Language lab	40%
Software being used, if any	Educom/TATAEdge/Teach Next	40%
	MS OFFICE- PPT	60%
Frequency of using e-learning in teaching	Once a week	50%
	Twice a week	20%
	Twice per term	10%
	Not used	20%
Source of using e-learning	Language lab/ AV Room	20%
	Digital Library/ Wi-Fi	10%
	Computer/Internet/Video clipping/PPT	40%
	Smart board	30%

The study revealed that sixty percent teachers under study used PPTs for instructing while twenty percent used smart class and language labs. Use of Smart Board is restricted to those schools has the infrastructure and limited further by the availability of the relevant e-learning module.

Most teachers claimed to use technological aid at least once a week, while there were some teachers who used them twice in 6 months and others who did not use technology.

One of the school had a single AV room shared by the entire school from classes K-XII and one school had a recording room plus a K-yan, shared by the entire school for which one months' advance booking was essential if it is to be used for educational purposes. Most schools did not have web access/Wi-fi outside computer labs for either teachers or student. None of the school had digital libraries, though some of them stocked educational CDs.

Table 2: Means and methods of using e-learning by students

Particulars	Percentage	
	Yes	No
If technological aids are used in teaching	60%	40%
If technological aids are used frequently (once a week)	39%	61%
Able to finish given e-module exercise within one period	22%	78%
Visits to language/technology labs	30%	70%-
Computers used for e-modules work properly	60%	40%
Use of e-learning in the past two weeks	23%	67%

It is note-worthy that when questionnaires were administered to the students of the schools under study to gauge their experience of the use of technology it was found that technology is not used very frequently in the classroom. Only thirty-nine percent students responded in affirmative when questioned if technological aids are used frequently in teaching (once a week) while sixty-one percent of students claimed that their teachers do not use technology very often. Seventy eighty percent students mentioned that they are not able to complete exercises on e-learning modules in the duration of a single class (45 minutes; effectively 30 minutes). This aspect may be related to the length of the topic being taught or may also indicate that the computers do not work as fast as they should, as pointed out by some of the respondents. Forty percent students mentioned that the computers are very slow, they consume a lot of time to open and hang often. Only 23% students responded in affirmative to the question if e-learning was used for teaching in the past two weeks.

Table 3:   Responses about Training of Teachers in using e-Learning

Particulars	Percentage	
	Yes	No
Formal training in using e-learning material	20%	80%
Attended works shops on ICT	100%	-
More training required for using e-learning	100%	

Only twenty percent teacher respondent had application based training in using e-learning sources and most it was acquired on job. Eighty

percent teachers felt that they have limited knowledge when it came to using technology and e-learning resources and expressed the need for more training in the use of technology. Even though all the respondents have attended multiple workshops organized by schools on software or smart class trainings, they felt that they require expert trainers and training in using the existing and new technologies while teaching. This is indicative of a need in improvement of the quality of technological training that teachers have received at pre-service and in-service level.

Table 4: Disposition of Teachers and Students towards using e-Learning

Particular	Teachers' Response		Students' Response	
	Yes (%)	No (%)	Yes (%)	No (%)
E-learning makes class interesting and increases attention span.	100 %	0	100%	-
Comfort in using e-learning	80%	40%	60	40
Using e-learning for teaching learning is not essential	20%	80%	40	60
Technology provides motivation	82%	18%	80	20
E-learning enables constructive learning	80%	20%	60	40

All teachers and student respondents believe that using e-learning makes the class interesting breaking the monotony of teaching from books, which increases the attention span of learners. Eighty percent of teachers and 60 percent students claimed that they are comfortable with using e-learning resources. This is related to their level of training in using e-learning, which has a direct impact on their disposition towards e-learning and the frequency of its usage during teaching. Most teachers and students respondent displayed a positive disposition towards using e-learning with only 20% teachers and 40% students claiming that it is not essential. Approximate 82% teachers and eighty percent of student respondents claimed that use of technology motivates them to learn and that they feel comfortable while using computers indicating a positive disposition. Majority of the teacher and students respondent feel that e-learning enables constructive leaning.

Findings and Conclusion

An overview of the findings based on the responses given by the teachers and students revealed that adequate measures have to be taken to enable the teachers to effectively use technology in teaching and learning process. This calls for a dual approach of brining a systemic and curricular change in teacher training colleges on one hand and providing adequate in-service training to existing school teachers on the other. Student teachers often acquire basic computer literacy in B.Ed. colleges, hence are not able to creatively and effectively inculcate technology in their teaching practices. The course also focuses more on the theoretical aspect rather than instilling skills where student teachers can innovatively acquire and apply skills to produce teaching modules or e-learning material.

Technological Infrastructure of both teacher training institutions and schools is another vital aspect that affects the effective inculcation of technology in the teaching-learning process. All schools understudy did not have adequate infrastructure, with respect to language labs and e-learning resources. Where there were language labs; teachers felt taking students to labs every-week was time consuming activity and hindered course completion. Most teachers relied on the use of PPT and video clipping. School, in which there were AV rooms, faced the problem of overbooking, leading to ineffective resource usage.

Though most of teachers under survey displayed a positive outlook towards the idea of using technology some considered it a burden and felt that role-play, project method etc., are more useful in affecting learning. It was observed that some teachers were using technology for the sake of using it, and were not oriented towards aligning its usage with the learning objectives. Some teachers used video clipping to generate initial interest but were unable to sustain the interest to effect learning.

Student survey revealed that technological support even where available is also not used effectively. Most teachers are not making adequate use of technology and are not in a position to manage or respond to the concerns that arises in the process of using these technologies. It has been observed that often the computers in language labs do n't function properly and the headphones are broken or faulty. There is need for appointing experts or have post sale services

with agencies providing ICT facilities in the field of education to tackle such concerns.

Lack of technical know-how owing to inadequate training is a major roadblock that plagues the teachers today and also affects their outlook and ability to use technology in classroom. The current pre-service course offer one paper on educational technology, in which basic skills of using computers and at times power-point presentations (PPT) are taught. All teacher respondents had gathered the knowledge of using technology (making PPTs, language lab or digital lab, Smart boards etc,) after joining the profession. Many teachers in-spite of having adequate experience were not exposed to the use of smart boards and language lab considering their schools could not provide such facilitates. Most teachers were willing to use technology and wanted to undergo formal training and their schools to appoint an expert trainer to help them use and inculcate creative and innovative methods of teaching.

Attaining funding to enhance infrastructure is important to enhance the capacity of teachers and students in using e-learning. There is a need for systemic collaboration between government and educational agencies (public and private partnership) to promote the inculcation of technology in education. Government's intervention at state and central level is imperative in allotting adequate funds and also provide support in terms of government agencies working on developing e-content and modules for school.

The National Policy on ICT in School Education (2012) also forwarded such guidelines and suggested a setting up of an advisory board at the state level to oversee the successful implementation of ITC in schools. The need of the hour is to do a follow up of the measures suggested in policy framework.

Implications

The teachers must understand the importance of using technology in today's time, and should make an honest attempt to inculcate it in their teaching practices. They should not feel burdened by technology, rather should understand that using technology will fasten the process of teaching and learning, making it more interesting.

Students are observed to be enthusiastic about using technology in their learning process, and only a few of the respondent under study felt uncomfortable with its usage. Children who do not have computer or

internet access at home must be supported and encouraged by schools to use the computer lab for learning and enhancing their skills.

Teachers have to be adequately trained in the use of technology at both pre-service and in-service level to equip them with the skills and knowledge required to use both existing and new technologies while teaching. Therefore, the teacher training institutes should lay adequate stress on providing application based course on educational technology.

A look at the current B.Ed. course content would reveal that the theoretical component remains much higher than the application based component. It is also felt that teacher training colleges will have to considerably enhance their own technological infrastructure to be able to provide application based technological training to trainee teachers to enable them to inculcate e-learning and other ICT based practices in their pedagogical style.

Schools adopting ITC in education must provide periodic in-service training to teachers, to enable them to use these technologies effectively and efficiently. Adequate trainings and workshop by both, external agencies or experts and peers should be conducted. New-hires should be made to take sessions to apprise them of existing teachers of new ways of inculcating technology in the pedagogical process.

Access to hardware, software and adequate web connectivity is one greatest concern. Adequate infrastructure needs to be put in place such as; buildings to house the equipment, computers, installing smart boards, and affordable internet services. It was observed that schools under study purchased e-learning modules from privately run organizations and business houses, which were very expensive. With adequate training teachers can be encouraged to develop in-house modules in collaboration with government agencies.

It was observed that most schools under study had classes flooded with not less than 50 students. Computer lab, often used as language labs or multipurpose labs did-not have adequate number of computers to accommodate every single student even when taken in two different batches, hence it is important that schools should invest in separate language or e-learning labs.

Overall, both teachers and students largely have a positive disposition towards using technology. Today's teacher and student need to be adept in the language of technology and e-learning, only then will they be in a position to stay abreast with today's time. It has been proved by

various studies conducted in the field of technology and learning that using e-learning helps in enhancing the interest, attention level and performance of students. Teachers certainly have a vital role to play in the promotion, and implementation of technology in the teaching and learning process

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Barriers of ICT Integration in Teaching Learning

Harjeet Kaur Bhatia[2] & Zeba Ilyas

[2]Professor & Head & [1]Research scholar

Deptt of Educational Studies, Faculty of Education

JamiaMilliaIslamia, New Delhi

Email: zeeba.ahmed5@gmail.com & harjeetkaurbhatia@gmail.com

Abstract

Presenting even a novel idea may not find itself attracting by using a conventional mode at any level of teaching. Teacher in today's world is not deprived of the learning material. Massive information is available to teachers on the internet and the related software which needs to stored manipulated and presented in a manner so that the information is converted into knowledge. Information Communication Technologies are the tools which can be used by the teachers in teaching learning process in a way that it can develop skills of critical thinking among the learners. However it would be possible only when the use of ICT is made trouble free. The present study focuses on to identify the potential barriers which are making ICT integration in teaching learning a difficult task.

Key words: *ICT-information communication technology, ICT integration.*

Introduction

Education stands out to be one of the main keys to socio-economic development and improvement in human welfare. Information and communication technology (ICT) is playing an important and significant role in development of modern economies and society .The world is going through the technological revolution and adoption of new technologies in the education system across all levels of education across the world. Education sector around the world is trying its best to incorporate ICT in teaching learning process to impart knowledge and

to develop high order thinking skills among students. Information communication technology is a versatile instrument as it has the capability not only to engage students in instructional activities to increase their learning, but also helping them in solving complex problems to enhance their cognitive skills. ''As ICT has the means to aid in the preparation of learners by developing cognitive skills, critical thinking skills, evaluation and synthesising skills, in addition to that, ICT provides fast and accurate feedback to learners. It is also believed that the use of ICTs in education could promote 'deep' learning and allow educators to respond better to different needs of different learners. ICT-supported learning environments could be beneficial to a constructivist teaching approach which will be helpful to students in their development'' (A.Ghumi, 2013).

The incorporation of ICT in the classroom teaching-learning is very important as it provides opportunities for teachers and students to store, manipulate, and retrieve information, encourage independent and active learning, and motivate teachers and students to continue learning outside school hours. It also helps to plan and prepare lessons and design materials such as course content for its effective delivery. ''There is a worldwide need felt for integrating ICT into education in order to improve the pedagogy to reflect the societal change'' (Plomp et al, 2007).

Importance of using ICT in Teaching Learning Process

Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems(Bottino-2003, Bhattacharya and Sharma-2007, Mason-2000, Lim and Hang-2003) it improves the perception and understanding of the world of the students. Thus ICT can be used to prepare the workforce for the information society and the new global economy (Kozma-2005)It canalso facilitate the development of scenarios, which can rarely be witnessed in practice. ICT can play a valuable role to monitor and log the progress of the students across the time, place and varied activities. E-education can provide access to the best gurus and the best practice or knowledge available (UNESCO 200). The globalization process has always created a large market of offshore students. To reach them, information technology is the only convenient medium, which can offer education as a service (Collins et al, 2001, Bhattacharya and Sharma-2007)

This is an information age where use of new technologies in the classroom is essential for providing opportunities for students and teachers. Traditional educational environments do not seem to be suitable for preparing learners to function or be productive in the today's society. Any organization that does not incorporate the use of new technologies in their institutions cannot seriously claim to prepare their students for life in the twenty-first century. This argument is supported by Grimus, who pointed out that "by teaching ICT skills in higher educational institutions the students are prepared to face future developments based on proper understanding". ICT helps to serve as a means of improving efficiency in the educational process. The use of ICT in education can help improve memory retention, increase motivation and generally deepens understanding in students. ICT can also be used to promote collaborative learning, including role playing, group problem solving activities and articulated projects. ICTs allow the establishment of rich networks of interconnections and relations between students and teachers. It has been observed that technology has the power to change the ways students learn and teachers teach. In today's context technology has "revolutionized" the learning process. In other words, ICTs extend teacher' and students' capabilities, and their well determined use can transform roles and rules in the classroom handling and exchanging information, teaching methods, learning approaches, scientific research, and in accessing information and converting information into knowledge. Teachers could use ICT to facilitate learning and to develop critical thinking skills among the learners. "The whole purpose of using technology in teaching is to give better value to students. This better value should also impact the learners/students" performance. ICT holds much promise for use in curriculum delivery. Thus, technology can effectively improve teaching and learning abilities, hence increasing learners' performance.

Integration of ICT in Teaching Learning

The effective use of ICT depends largely on technically competent teachers and with their help, we will have more competent students. These students should be able to appreciate the potential use of ICT and have positive attitude towards it.

The integration of ICT in teaching and learning is not a method; rather it is a medium in which a variety of methods, approaches and pedagogical philosophies may be implemented (N Garrat).This

statement indicates that the effectiveness of ICT depends on how and why it is applied and integrated.

Access to infrastructure and resources related to ICT is a necessary condition to the integration of ICT in education .Effective adoption and integration of ICT into teaching and learning depends mainly on the availability and accessibility of ICT resources such as hardware, software, etc. Obviously, if the teachers and students cannot access ICT resources, then they will not be able to use them. Therefore, access to computers, updated software and hardware are important elements to successful adoption and integration of technology. (Chales 2012) have found that access to technological resources is one of the effective ways to teachers' pedagogical use of ICT in teaching which ends up into bringing a change in students' behaviour and performance.

The process of using ICT in everyday education is very complicated. The opportunities provided by ICT to support teaching and learning are not problem-free. The virtually limitless opportunities of access to information in an educational context can pose a real danger of information if the teachers do not have the skills in filtering information for relevance, or are unable to establish a coherent organizing principle. ''Both students and teachers may lack the necessary skills to access, process and use information'' (Jones &Kenezek 1993). There are a number of difficulties also which act as barriers and prevent teachers to integrate ICT into the classroom. As (Jones 2010) defines, a barrier is that which makes the things difficult to happen.

Need for the Study

There is no denying of the fact that ICT has become an integral part of teaching learning process, but it is not always workable for the teachers in most of the schools. National policy on ICT for school education came into being in 2013, but if it was so easy the policy must have been implemented in till now. But that is not the case, the schools particularly government schools are still unable to implement the recommendations of the policy. Creation of infrastructure, Lack of internet connections, teachers not equipped from the skills, knowledge and competence point of view to use ICT, lack of training for teachers, lack of software/ hardware etc. are the variety of reasons for the teachers which they are facing as barriers in using ICT. Teachers due to many constraints are unable to evolve effective instructional material to cope with the emerging trends in the curriculum and pedagogy. The schools may not contribute to develop a knowledge society unless they

equip the teachers to address the issues involved in all-round, socio economic development of the nations and global competitiveness. This, however, is not possible unless the teachers take full advantage of the latest technologies which are being used across the world and the schools lift such barriers for using ICT. The present study is an effort to identify the barriers and constraints in the effective use of ICT.

Following objectives were formulated:

- To study access related barriers in the use of ICT in schools.
- To study infrastructure related barriers in schools.
- To study the barriers related to skills and knowledge etc.
- To study teacher preparation related barriers.

Methodology

The researcher selected 4 Government Schools from South East Delhi. From each school 10 Teachers teaching at senior secondary level from all subjects were included in the sample. The sample of schools and teachers was selected on convenient basis.

For data collection a questionnaire was developed for the teachers. The questionnaire included items related to all possible hurdles in the ICT integration in teaching learning process.

Analysis and interpretation of the data.

The data were analyzed qualitatively and interpreted as follows:

Access related barriers		
Components	**Yes (%)**	**No (%)**
Computers	20	80
Software	60	40
Internet	75	25
Video Clips	75	25
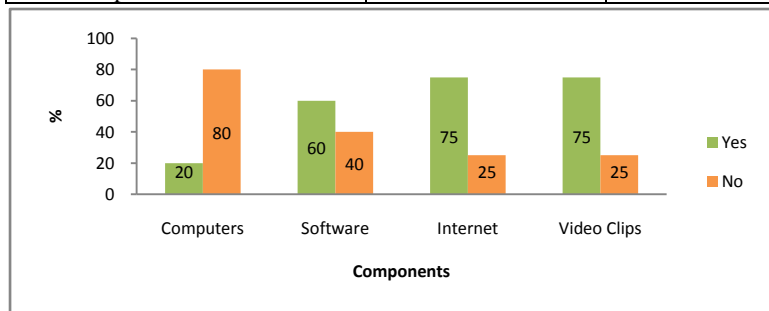
The most important component in the use of ICT is access to the technology (software and hard ware both) itself and the data revealed that internet, other accessories and software/hardware are the important barriers to use the ICT. Computers were available but teachers reported that most of the computers are non-functional. Majority of the schools have either no or disruptive internet connectivity which makes the use of ICT difficult.

Infrastructural Barriers

Components	Yes (%)	No (%)
Computer Lab	80	20
Smart Classroom	90	10
CDs	10	90
Digital Devices	80	10

Although the government is emphasizing ICT integration in the teaching learning process at all levels but the responses of the teachers reveal that there is still a dearth of ICT related infrastructure including computer labs, smart classrooms and the digital devices. The teachers reported that the schools, where there is a smart classroom, never or rarely used. Digital devices are almost entirely missing. Its graphical presentation is as follows:
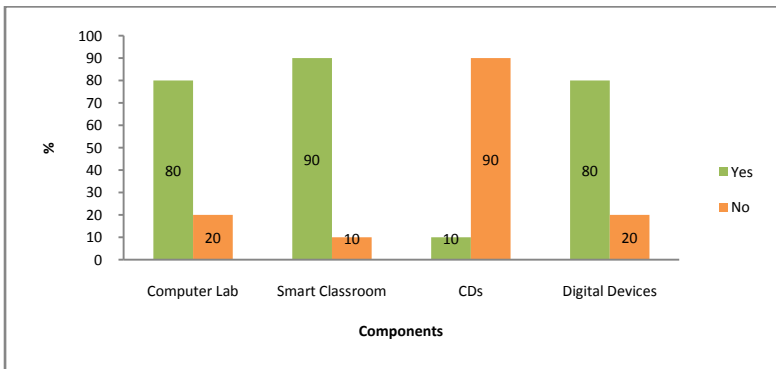
Skill/Knowledge related barriers

Components	Yes (%)	No (%)
Frequent changes in technology	60	40

Lack of skill to integrate	60	40
Use of application like PPT etc.	20	80
Lack of developing high order thinking skill	94	06

The teachers (60%) found it difficult to use ICT due to frequent changes and the latest developments of technology which are taking place every day. Moreover, it was observed that most of the teachers could use PPT comfortably but majority of them used it just as a replacement of the Black/white Board in the classroom and were unable to integrate it in teaching learning. In today's global competitiveness developing high order thinking skill is inevitable, which was almost totally missing among teachers.
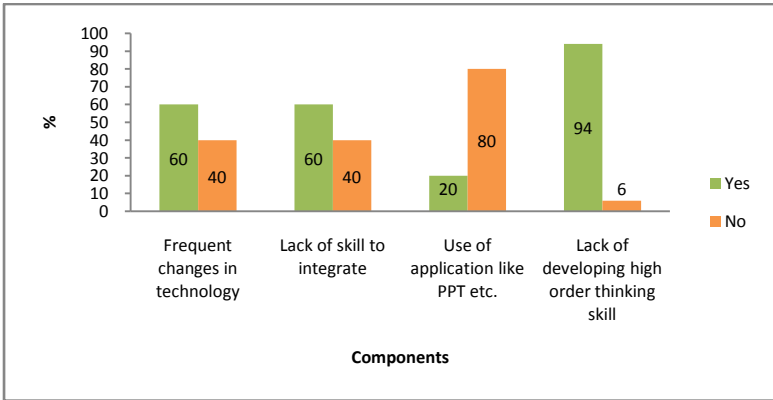
Teacher Preparation related Barriers

Components	Yes (%)	No (%)
Non availability of costly soft wares	90	10
Lack of reliable information	37.5	62.5
Time Consuming	50	50
Syllabus coverage	60	40
Lack of effective training	70	30

Teachers' personal problems are also the barriers which was pointed out by the respondents as 90% of them indicated that costly soft wares are not available to them. Approximately 38% teachers felt that there is a lack of reliable information/material. More time taking and syllabus coverage are also some issues involved in the use of ICT. One of the

most important component for the effective use of the ICT is proper training of teachers which is lacking and is posing as a biggest barrier in the use of ICT.
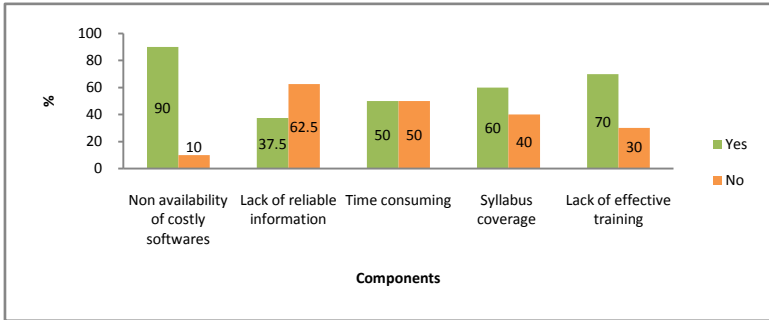
Conclusion

Though the study has not been conducted on a large scale but this is the mirror that reflects the trend in most schools regarding ICT integration in teaching learning process. The government seems to have good intention but in the 'inverse proportion of the extension'. This extension i.e. infrastructural provision is not as is needed for the appropriate use ICT. Implementation of the ICT Policy of School Education seems to be a distant dream unless adequate infrastructure, hard ware/ software are made available in the schools. The same is substantiated by Cross and Adam -2007.and Sharma- 2003. Proper training with frequent interval is also required for making ICT an effect ion tool to develop high order thinking among the students because the technologies are changing fast.

Implications

The findings of the present study implies that the schools should make sure that the costly infrastructure such as computer labs and smart classrooms are made functional. The concerned bodies should allocate funds so that the required software/hardware and digital devices are provided by the schools for the effective use of ICT. Directorate of Education or other concerned agencies should also arrange the training programmes at frequent intervals so that the teachers can make better use of changing technologies. Last but most important implication is that the government should have positive and a very strong will to provide all administrative and financial support to ensure the use of ICT in the schools as an effective tools for teaching learning.

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Attitude towards E-Learning: A Study of In-service Teachers and Teacher Education Students

Dhananjay Joshi[1] & Sonal Chabra[2]
[1]Professor & [2]Assistant Professor
[1]School of Education, Guru Gobind Singh Indraprastha University
[2]Rawal College of Education
Email: djjosh007@gmail.com

Abstract

E-Learning is emerging as an alternative paradigm to education delivery at all levels including school education. Learners from a very young age are exposed to different kinds of information and communication technology tools; thereby have readiness to use them for education. This necessitates that the teachers are prepared for the same in terms of technological know-how and a favourable attitude towards e-Learning. The present study was designed to ascertain the attitude of in-service teachers and teacher education students towards e-Learning and significant difference between the two, if any. Analysis on the responses, on a 12 item Likert scale, from a sample of 50 in-service teachers and 50 teacher education students revealed that there is a significant difference between the two groups with teacher education students holding an extremely favourable attitude and in-service teachers having a favourable attitude towards e-Learning.

Introduction

The role played by different forms of information and communication technology has increasingly assumed an important role in facilitating the educational processes and systems of today (Oh & Park, 2009; Vaughan & Garrison, 2006). Due to the ever-changing nature of information and communication technologies, there is a constant demand and expectation at different levels of education to incorporate increasing levels of technology into the design and delivery of their

curriculum. The demand is not only at higher education level but also a trend is being observed that the nature of curriculum implementation is changing at school level. Schools are undergoing a lot of changes. Children from a very young age are exposed to different kinds of gadgets and other ICT based resources, which opens them to various non-traditional and unconventional avenues of learning.

Consequently, the change in preferences and usage of ICT by the learners has placed academic staff in a situation wherein they are expected not just to be acquainted with these newer forms of learning but also be able to use them effectively in school learning. Further, the expectations are that this significant change should happen within a very short and often unrealistic time-frame. However, one of the challenges of teaching with technology, according to (Bates & Poole, 2003, p. xiii)**, '**You cannot possibly keep up with the technology. The paradox of technology enhanced education is that technology changes very rapidly and human beings change very slowly'. The teachers thus need to adapt to the changing demands very quickly so that they fit into the frame of their learners.

The different technology forms have given a new paradigm to education – ***E-Learning***. In simple words, e-Learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers, but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, personal digital assistants) as they are developed and adopted. E-Learning is a structured, purposeful use of electronic system or computer in support of the learning process (Allen, 2003). ASTD (2001) gives a very comprehensive definition of e-Learning – "E-Learning covers a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes delivering content via the Internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-ROM.

Lumumba (2007), in his study on the challenges facing e-Learning in public secondary schools, based on the NEPAD pilot project schools in Kenya, established that the e-Learning project faced many challenges. He singled out ICT skills inadequacy among the teachers and learners, lack of adequate e-Learning facilities (infrastructure) and negative attitude towards e-Learning among students and teachers as key obstacles to the success of the e-Learning project. The teachers' attitude is a major predictor of the acceptance and actual utilization of computers in the classrooms and in the management of their work. Thus, the attitude of teachers towards e-Learning is an important factor shaping the success of e-Learning in any kind of educational setting.

Need of the Study

Teachers traditionally are more or less prepared by pre-service teacher education courses. The in-service programmes also add to the skill set and orientation of teachers. Besides the theoretical inputs and training received in pre-service and in-service education, there is another factor which assumes a very important role in usage of different forms of e-Learning or ICT or for that matter any form of teaching-learning technique. This factor is the 'attitude' teachers hold towards the particular aspect. Attitude towards e-Learning is also shaped up by a number of factors including the training received, exposure to different aspects, theoretical knowledge of different ICT resources, computer self-efficacy, Internet self-efficacy, computer experience, internet experience, and computer anxiety among other factors. Their computer experience including perceived self-efficacy, enjoyment, and usefulness of using e-Learning also plays a role (Liaw & Huang, 2011). In turn, positive student attitudes and behaviors towards e-Learning are critical to their e-Learning readiness and acceptance (Lim, Hong, & Tan, 2008; Selim, 2007). Further, amongst various factors, the influence of pre-service training is paramount on the teachers. The training they receive and also the experiences they gain – both have an influence the kind of attitude prospective teachers develop. These prospective teachers could themselves become trainers or teacher-

educators in the future. Thus it becomes essential to ascertain the attitude of teacher education students towards e-Learning.

Review of Related Literature

With the broad expansion of ICT in education during the last decade, many research studies have explored the attitudes of users (educators and students) towards the integration of ICT in education (Mishra & Panda, 2007). Nassoura (2012) pointed out that many students had positive attitudes towards e-Learning because it had a positive impact on their motivation as well as self-esteem. However, in a study based in Botswana, Brown, Thomas, vander Merwe and van Dyk (2008) found that the socio-cultural environment in Botswana is very strong and students in their higher learning institutions are still strongly embedded in the culture that their attitude towards e-Learning reflects it. Despite having taken significant steps towards a Western-style economy and towards urbanisation, the country maintains strong connections to its traditional roots.

However, the reserved attitude towards technology-based learning is gradually disappearing in all kinds of societies with the increasing usage of Internet-enabled mobile devices. Mobile devices such as Internet-enabled phones are very popular and are increasingly being used for blogging and social networking; this, in turn, helps improve user attitudes towards e-Learning. Selim (2007) stated users who were very familiar with web technologies and the skills needed to use computer and mobile devices for instruction developed positive attitudes. On the other hand, students who were not skilled in ICT became anxious about the use of computers, had lower expectations from educational technology, and they did not believe in the benefits of e-Learning (Vrana, Garyfallos, Zafiropoulos, & Pascha-loudis, n.d.).

Objectives

The objectives of the present study were -

1. To study the attitude of in-service teachers towards e-Learning.
2. To study the attitude of teacher education students towards e-Learning.

3. To study the difference in attitude of in-service teachers and teacher education students towards e-Learning.

Study Design

Cross–sectional survey design was selected for the study because such a design has the ability to elicit large amount of information through a single questionnaire administered to many participants. A total sample of 100 including 50 in-service teachers and 50 teacher education students was selected by incidental sampling from the National Capital Region of Delhi.

Data was collected using a five point scale developed by Dr Santosh Panda and Dr Sanjaya Mishra (2007). The scale comprised of 12 items which helped in assessing attitudes towards e-Learning. The scale had five-point agreement /disagreement scale given with the numerical values assigned to each point- 5= strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, and 1 =strongly disagree.

Excel was used to analyze the resultant information to calculate averages, produce frequencies, percentages, and to do further analysis using Welch's t- test to measure the significant difference between the two groups.

Major Findings

The results obtained from the analysis of the responses on different items have been clubbed under following headings for better comprehensibility of the readers:

Demographic details of the Sample– The in-service teachers who were 50 in number included 40 females and 12 males. The average age of in-service teachers was 34.56 years. The average experience of in-service teachers was 4.8 years in the school teaching. Out of a total of 50, 23 were post-graduates and 27 were graduates. The sample of 50 teacher education students comprised 38 females and 12 males. The average age of teacher education students was 25.96 years. The group of teacher education students had 35 who were post graduates and 15 were graduates.

Attitude of In-Service Teachers towards e-Learning – The role of teachers is central in implementation of any pedagogic innovation or any form of technique in teaching- learning situation. The attitude of in-service teachers was 4.06 which is an indicator of a favourable attitude towards e-Learning. Following table would give details about the variation in attitude of in-service teachers towards e-Learning –

S.No.	Range of Average Score	Number of In-service teachers	Interpretation
1	>4.5	10	Extremely favourable
2	3.6 – 4.5	38	Favourable
3	2.6 – 3.5	2	Neutral
4	>2.6	0	-

It is very clear from the above table, that majority (76%) had favourable attitude towards e-Learning, 20% had extremely favourable and only 4% had neutral attitude towards e-Learning. The numbers are an indicator that the in-service teachers are upbeat about the different aspects of e-Learning. Amongst all the items, there was a noteworthy item which gathered the maximum score from all the respondents. The item was "*e-Learning will bring new opportunities for organizing teaching and learning*". This is an indicator of optimism of in-service teachers towards the new opportunities which e-Learning can offer. In-service teachers, unlike teacher education students, were that part of the sample that has already interacted with the school education system – thus strengthening the belief in success of adoption of e-Learning at school education level.

Attitude of teacher education students towards e-Learning – The teacher education students are the future teachers of the schools or may be even the prospective teacher educators. Their attitude thus becomes an important factor in predicting the success of e-Learning at school education level. The average attitude of teacher education students was 4.56 which is an indicator of an extremely favourable attitude towards e-Learning. Following table would give details about the variation in attitude of teacher education students towards e-Learning –

S.No.	Range of Average Score	Number of In-service teachers	Interpretation
1	>4.5	40	Extremely favourable
2	3.6 – 4.5	10	Favourable
3	2.6 – 3.5	0	Neutral
4	>2.6	0	-

A glance at the above table makes it evident that the teacher education students hold an extremely favourable attitude towards e-Learning. 80% of teacher education students had an average attitude of more than 4.5 which is an indicator of the aspirations and hopes of teacher education students from e-Learning. Rest 20% were also having a favourable attitude towards e-Learning and unlike there was none who held even a neutral attitude towards the same.

Difference in attitude of in-service teachers and teacher education students – The third objective of the study was to analyze the difference between the two groups of in-service teachers and teacher education students in their attitude towards e-Learning. The following table summarizes the same-

Group	Size of group	Average score	p-value
In-service teachers	50	4.06	0.28
Teacher Education students	50	4.56	

Note – Alpha level was 0.05

The above table clearly shows there is a significant difference in the mean scores of the two groups. Thus, a significant difference was observed in the attitude of in-service teachers and teacher education

students in their attitude towards e-Learning, the attitude of teacher education students being more favourable.

Implications of the Study

The results of the study leaves the education community with several implications which if paid attention to can help in adoption and also further better the benefits gained from the use of e-learning. Some of these are –

1. Since a positive attitude towards e-learning among prospective teachers prevails, e-learning should be well integrated into the curriculum of teacher education courses. This would give them more opportunity to have hands-on with the technology and would be able to use it better when they get into teaching.

2. It is well known that motivation and involvement of teaching staff are important factors in the successful introduction of new media. Results of the study reveal that there is a favourable aspect to it because prospective teachers have a favourable attitude. Thus the authorities should provide resources both at school level and higher education level so that opportunities offered by e-learning can be accessed to and utilised well.

3. E-learning provides a lot of autonomy to learners if integrated appropriately into the curriculum and used by the teachers. A favourable attitude does the half job, the other important aspect would be providing the right training to the teachers to dwell e-learning with their teaching style.

Conclusion

As Internet facilitates communication irrespective of the distances, providing easy access and clear transmission of all type of information needed in the learning process, which includes testing and evaluation systems, e-Learning has become a more suitable environment for many students. This is happening at levels of education. However, for the success of e-Learning it is essential that a favourable attitude is prevalent both among the users, i.e the learners and the implementers, i.e. the teachers. The results of the study are promising as both in-

service teachers and teacher education students hold a favourable attitude towards e-Learning. The onus thus lies on the providers of the resources in the school to provide an environment conducive to e-Learning.

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Awareness of Cyber Ethics among Teachers' and Senior Secondary School Students of Delhi

Mehnaz Ansari

Professor

Department of Teacher Training & Non Formal Education

Faculty of Education, Jamia Millia Islamia, New Delhi

Email: ansarimehnaz@gmail.com

Introduction

Improvements in technology appear to provide an exceptional opportunity to improve learning and teaching within the education system. Earlier, using technology in education was an arguable topic in the society. On one hand there were people who favored the use of technology in education due to its positives; but on the other hand there were people who were against the use of technology in education. But, gradually technology became the part of our lives and education system. Its positives outnumbered the negatives and now, with the use of technology, education has occupied a complete new meaning. Technology and education are a great combination if used together with a right reason and vision.

National Curriculum Framework (2005) Position Paper on "Educational Technology" states that "Education Technology is the efficient organisation of any learning system adapting or adopting methods, processes and products to serve identified educational goals. This involves systematic identification of the goals of education, recognition of the diversity of learners' needs, the contexts in which learning will take place and the range of provisions needed for each of these."

Social Issues: The Effects of Computers on Children

The introduction of the computer and the internet has had a profound effect on the lives of our children. Today, computers have become extremely common, with nearly every child having access to one. Through this extensive use, children become closely connected with

computers, using them at home, at school, at a childcare center, or in any other setting.

The outcome of the relationship between children and computers lies between two extremes, beneficial or harmful. Without the proper guidance, children may suffer physical, social, and psychological effects from prolonged, unmonitored computer use. Yet, with the proper supervision, parents can guide their child's experience with computers, largely negating the negative effects. Thus, it is important for parents, teachers, and other adults who deal with children on a regular basis to learn how to make sure children get the right experience from computers and the internet.

Learning with Technology: If schools really want to promote meaningful learning, then the ways that we apply technologies in schools must transform from **technology-as-teacher** to **technology-as-partner** in the learning process. Learners should be engaged to learn with the technology and focus should be on developing a technologically sound learning culture.

E-Learning: Pedagogy and Ethics: "The single most important thing we can do is to make sure we have a world class education system for everybody. That is a prerequisite for prosperity. It is an obligation that we have for the next generation." (Obama, 2010).

 Learning is centered around the interests of the learner … Learning is immersive—learning by doing—and it takes place not in a school but in an appropriate environment. There is a growing awareness in our country about the need for new visions of information and communication technology (ICT) and e-learning that takes into account the changes in modern society. The new ICT tools shed light on innovative opportunities for learning, which require digital skills from students who are going to read off of computer screens for the rest of their lives. At the same time, it is important to note that in our modern, knowledge-based society, what we learn and know also changes linearly with how we learn and know. This paper will examine and discuss the awareness of Cyber Ethics among children using Internet and Teachers who promote e-learning. E- Learning can be viewed as computer assisted learning, where part or all of the learning content is delivered digitally. More recently the pedagogical dimension of e-learning has become prominent. E-learning comprises all forms of electronically supported learning and teaching. E-learning according to Markus (2008) can be defined as a learning process created by

interaction with digitally delivered content, network-based services and tutoring support.

Ethics: It is easy to use the internet but it's not always easy to do it right. Ethics are the rules we use in life to help decide what is right and wrong. Cyber ethics is how we act when we are on the computer. Problems here are often similar to ones faced in real life, for example; if we want to take a CD from the store it is stealing. If we download a song off the internet without paying for it or without permission, that's considered by many people as being inappropriate and similar to stealing, particularly because there is no way to track how the creator of the song should get paid for his/her work; for others this issue is debatable, and making a digital copy of a work is not considered stealing; however, it does not mean that we can use downloads as substitute for the commercial release of songs. We have to think about other people's ethics too.

You can have professional ethics, but you seldom hear about professional morals. Ethics tend to be codified into a formal system or set of rules which are explicitly adopted by a group of people. Thus you have medical ethics. Ethics are thus internally defined and adopted, whilst morals tend to be externally imposed on other people.

Cyber Ethics

Cyber Ethics is the philosophic study of ethics pertaining to computers, encompassing user behavior and what computers are programmed to do, and how this affects individuals and society. Secrecy refers to the protection of personalized information from being freely distributed. Also cyber ethics is the study of moral, legal, and social issues involving cyber technology. It examines the impact that cyber technology has on our social, legal and moral systems. It also evaluates the social policies and laws that have been framed in response to issues generated by the development and use of cyber technology. Hence, there is a reciprocal relationship here.

Teaching Youth Cyber Ethics

Protecting youth from dangers on the Internet is important, so is protecting the Internet from young people who might abuse it. As parents, caregivers, teachers, and adults, you work to teach youth Internet safety by telling them to keep their personal information safe and avoid predators, but it's just as important to teach youth Cyber ethics. Teaching teens about the ethical treatment of others on the web

and of websites and intellectual property (such as music, videos, and written materials) in cyberspace can help prevent cybercrime. While youth who commit cybercrimes may realize that their actions are wrong, they may not know that their Internet behaviors are illegal.

Many youth commit cybercrimes by

- Downloading and sharing copyrighted video and music files
- Harassing others via chat bots (computer programs designed to imitate human conversation)
- Hacking into school computer networks to deface websites, enter sites that the school forbids, or change grades.

With the increase of young children's using the internet, it is now more important than ever to inform children about how to properly use the internet and its dangers. It is especially hard to talk to teens because they do not want to be lectured about what is right and wrong. They seem to think they have it all figured out. That is why it is important to instill proper cyber etiquette at an early age. The study gives an insight into the Ethical use of Computers both by Teachers and Students and their awareness regarding cyber ethics.

Statement of the Problem

Awareness of Cyber Ethics among Teachers' and senior secondary School students of Delhi

Research Objectives

The objectives of the study were as follows: -

- To find out the awareness of Students towards ethics involved in using internet.
- This study has been done in the following dimensions-
- Current knowledge and ethics involved in using internet.
- Impact of internet on students teaching learning.
- To find out the awareness of teachers regarding cyber ethics.
- To study the efforts made by the schools to instill computer ethics in the children's.

Interviews were conducted with the teachers of the schools.

Current Knowledge and Ethics involved in using Internet

The researcher presented a series of questions to the students to check their current knowledge ethics related to internet. Responses provided by the Students are:

- All 40 (100%) students knew what ethics are. It means that every student in the sample knew about ethics and what is its use in internet.
- All 40 (100%) students also knew that ethics are involved in using internet.
- 20 (50%) students knew that they should not copy or use proprietary software for which they have not paid, but, none of them followed it.
- 30 (75%) students said that their schools have taught them about the cyber ethics.

Impact of Internet on Students Teaching Learning:

Under this category, students were asked questions about the impact of internet:

- 30 (75%) students thought computer cybercrime is high in our country especially while students do their assignments. But 10 (25%) students were not aware of cybercrime.
- All 40 (100%) students thought that using internet in inappropriate manner affects individual and society.
- All 40 (100%) students wanted schools to use filtering programmes for students using internet, because most of the students were not aware of the meaning of cyber ethics**.**
- All 40 (100%) students knew that we should not use bad language while using email.
- 20 (50%) students thought that hacking was the most common problem, but 20 (50%) students thought that hacking was the most common problem.

Teachers Awareness about Cyber Ethics

Teachers were asked questions aimed at determining the cyber ethics issues they deal with, their opinion on usefulness of ethics. The researcher presented a series of questions to the teachers to check their **knowledge** of cyber ethics issues related to internet.

- All 20 (100%) teachers responded that they teach their students not to use internet to harm others. It means that every teacher knew how to teach their students about the use of internet in a safer way.

- 10 (50%) teachers knew about the cyber ethics issues that teachers must deal with, but shockingly other 10 (50%) of them were not aware about the issues of cyber ethics.

- 15 (75%) teachers' thought that computer cybercrime is high in our country especially while students do their assignments. One of the teachers said that she had not heard about this type of cybercrime.

- 15 (75%) teachers said that online ethics should be a matter of individuals' choice, but 5 (25%) teachers did not agree that online ethics should be a matter of individuals' choice.

Usefulness of Ethics:

Under this category teacher were asked questions to enquire about their thoughts on use of ethics in teaching.

- All 20 (100%) of the teachers in the sample felt that there is a need for advocating cyber ethics among students.

- All 20 (100%) teachers thought that using internet will help them be more productive.

- 15 (75%) teachers thought that we should also make students aware of safe use of internet, but 5 (25%) of teachers were not aware of safe methods of using Internet.

- All 20 (100%) of the teachers thought that learning about cyber ethics can change the way students use the internet. One of them said that, "learning about cyber ethics is necessary for our students, because it can help change the way students use the internet".

- All 20 (100%) teachers were aware of meaning of cyber ethics.

- All 20 (100%) teachers wanted schools to use filtering programmes for students using internet.

- All 20 (100%) teachers agreed that students should use internet under the guidance of their parents.

To seek teacher's responses towards the efforts made by the schools to instill computer ethics in the children's in their respective schools, a case study involving five teachers from five schools was done. Interviews with the teachers revealed that filtration programmes were organized by the schools; they gave knowledge about use of computers and cyber ethics to students. During school time teacher must that there is no misuse of internet by the students. The schools allow only those websites to students that are useful for their studies only. The teachers strongly agreed that students should use internet in the supervision of teachers and parents. When asked by researcher, one of the teachers

said that today some parents don't have time for their children; hence there is no supervision of use of internet. The study also revealed that school should conduct parents teaching meeting in every month to increase awareness of ethics related to computers among parents. One of the teachers said that the future plans of school will promote the good education/knowledge of ethics in students, by organizing seminars on ethics, to make a separate classroom for teaching ethics, to prepare a teacher to teach about the ethics to the students.

In conclusion, it is to be understood that merely being aware about cyber ethics and its uses in internet doesn't ensure the effective use of internet and its resources for educational purposes. Necessary programmes should be provided to the students so that they can use internet in a proper way. Seminars and workshops should be held time to time in schools so as to develop awareness among students regarding cyber ethics. Parents' teacher meeting should be conducted every month to increase awareness of ethics related to internet among parents.

According to Don Parker, "For the first time in human history, computers and automated processes make it possible to possess, not just commit, a crime. Today, criminals can pass a complete crime in software from one to another, each improving or adapting it to his or her own needs." Cyber-crime is an evil having its origin in the growing dependence on computers in modern life.

The Government should take an active role in making resources for parents and children to learn about cyber ethics. With the increase in use of internet by young children, it is now more important than ever to inform children about how to properly use the internet and also safeguard themselves from its dangers. It is especially hard to talk to teens because they do not want to be lectured about what is right and wrong. They seem to think they have it all figured out. That is why it is important to instill proper cyber etiquette at an early age. The awareness levels in students and teachers regarding cyber ethics can be improved by motivating them and improving their skills regarding internet. Teachers of the school can put their efforts together to instill computer ethics in the children's.

These factors have to be taken into consideration if we want to advocate, sensitize and stop use of cyber-crime by our students.

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Adding Power to PowerPoint Using Active Learning Techniques in Instructional Material Development in Chemistry

Harjeet Kaur Bhatia[1] &Ali Haider[2]

[1]Professor &Head & [2]Guest Faculty

Department of Educational Studies,

Jamia Millia Islamia, New Delhi

E-mail:alihaider800@gmail.com & harjeetkaurbhatia@gmail.com

Abstract

PowerPoint has become a preferred way of presentation, communication and sharing knowledge in education. The paper describes active learning techniques and their usage in developing PowerPoint-based instructional material in chemistry on fission of a covalent bond. It begins with an introduction highlighting the complexity in teaching-learning of chemistry. The paper focuses on the need of development of instructional materials in chemistry, particularly on fission of a covalent bond. It described the use of active learning techniques, viz. conversation, leading questions, example-problems, guided examples and quizzes and pause procedure in PowerPoint. This paper has implications for instructional designers, teachers, prospective teachers, technology experts and others in the field of education.

Keywords*: Active learning techniques, Chemistry, Chemical bond, Fission of a covalent bond, PowerPoint*

Introduction

The complexity of chemistry can be inferred from the difficulties faced by teachers and students in dealing with the subject. The findings, which claim difficult nature of chemistry, have been reported in many researches. Hassan *et al.,* (2004) reported that students' have poor understanding in basic concepts of organic chemistry, namely polarity of bond, functionality and stereochemistry. Sirhan (2007) reviewed numerous research studies in chemistry education and listed a number

of students' misconceptions and (mis)understanding. Many others have explored students' (mis)understanding in chemical bonding, mole concepts, electrochemistry, and chemical equilibrium etc (Hassan *et al.,* 2004). The findings present a realistic view of the current situation in chemistry education. The cause of difficulties in teaching-learning of chemistry may be attributed to intrinsic nature of the subject (Johnstone, 2000) and the way chemistry is taught.

Intrinsic Nature of the Subject

The intrinsic nature of the subject has dual meaning: chemistry as a subject and learner as a subject. Chemistry as a subject is rich with concepts and algorithm. The concepts, which are presented in chemistry, generally cover three aspects: macro, micro and representational. For example, concept of 'water' covers all the three aspects (Figure 1). Macro aspect refers to physical aspect of the concept, including shape, volume, fluidity, rigidity etc, which is experienced at the tangible, visible and sensory level.
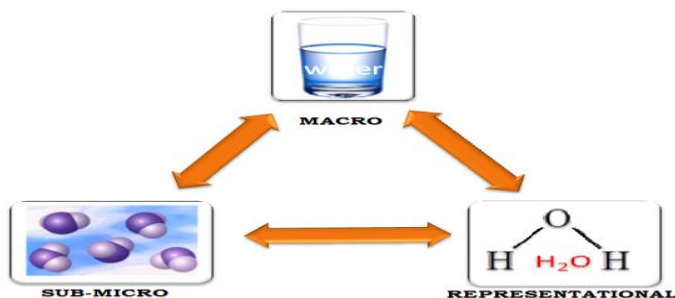
Figure 1: The Chemistry Triangle (adapted from Johnstone, 2005)

Sub-micro aspect refers to atomic and molecular level with the kinetic perspective which includes arrangement of atoms, molecules and ions; intermolecular force of attraction, intermolecular space etc. Similarly, representational form is concerned with formula, equation, graph, structural representation, etc. The abstract concepts are invisible which causes difficulty for students to understand (BouJaoude & Barkat, 2003).

The intrinsic nature of subject (learner) refers to characteristic of learners. A classroom of same age group contains a number of heterogeneity in terms of learning style, cognitive (operational) level of learners etc. For instance, a study shows that senior secondary students

of age group 15-17 differed in level of logical thinking. About 20% students were concrete thinkers, 27% students were at transitional level and remaining 53% students reached formal thinking level (Haider, 2016). The nature of chemistry and characteristics of learners makes teaching-learning of chemistry challenging.

Teaching Chemistry

Chemistry teaching particularly at higher secondary stage (Grade 11 and Grade 12) is challenging. The challenge can be inferred from the findings of a research study in which higher secondary school teachers reported that they had problems in the transaction of many concepts in chemistry. The reasons they had were abstract concepts, lack of appropriate teaching-learning resources, time constraint (Haider, 2010). The findings revealed that a large proportion of secondary and higher secondary students did not reach at formal thinking level (Haider, 2016; Bird, 2010; Adey and Shayer, 1990). The fact is that the instructional strategy applied to the abstract thinker may not be helpful to the concrete thinker of the same age. There are challenges for a teacher to strike a balance between instructional strategy and cognitive levels of students. A chemistry teacher should ensure that students learn how to develop connections among three aspects of a concept, viz. micro, sub-micro and representational. Keeping in view the nature of subjects and related challenges in teaching chemistry, appropriate instructional strategy and relevant materials for the transaction of content are needed which can bridge the gap between the thought and the demands of abstract ideas.

Need for the Development of Instructional Material on Fission of a Covalent Bond

Higher secondary students' understanding in covalent bond and fission-mechanism are pre-requisite for building advance concepts in organic chemistry. 2D representation applied to illustrate fission of a covalent bond on paper or blackboard apparently less meaningful to the students as it does not show the movement of electrons. In addition, the abstract ideas related to the mechanism of fission of a covalent bond during reaction cannot be transacted by demonstration methods, laboratory activities etc. The atomic, electronic, bonding concepts in chemistry are real but not directly related to learners' daily experiences and remain invisible from the eyes of learners. For this reason, the instructional material on fission of a covalent bond is needed.

PowerPoint Based Instructional Material

Historically, instructional materials developed for imparting instructions in education using machine system was originated from Skinner's work. Skinnerian's approach to individualised instruction and development of related instructional materials gained little appreciation than criticism. It was flayed for monotonous programmed instruction and drill and practice that were little compatible with varied nature of content. At that moment, educational technologists realised that the knowledge from three domains viz. technology, pedagogy and content should be applied in a balanced way for the development effective instructional materials (Mishra & Kohler, 2006; Sahin, 2011).

In the digital era, computer-based instructional materials have been frequently used for presenting, communicating and sharing knowledge. For the development of materials variety of tools are used, viz. conventional programming language, authoring language, and authoring systems, etc. However, PowerPoint based presentation, communication and knowledge sharing is still common in a classroom. PowerPoint application has many advantages as:

- The applications are either pre-installed with any PC-Windows or are available online as freeware.

- They run on most easily and are available on Windows platform.

- The PowerPoint is one of the most commonly used information communication technology (ICT) tools in education. It hardly requires specific skills for learner to operate a program or run a lesson.

- With small effort and skills, the PowerPoint presentation, lesson etc can be developed by teachers especially for those who have zeal for their professional growth and development.

- The PowerPoint-based presentation, lesson etc. could be easily stored and transported from one computer to another.

- The cost of the presentation, lesson etc using PowerPoint is appropriate.

Despite having many features and technical potentiality of PowerPoint, the power of PowerPoint is supposed to be ceased in many classrooms when it is used for teaching-learning purpose. Research claims that "presentation software [PowerPoint] still remains a relatively passive instructional activity. Research on strategies that incorporate active

learning into presentations would be valuable…." (Frey & Birnbaum, 2002, p.8). The qualifier 'active' or 'passive' learning in general refers to the way how the information presented to the learners is being attended. Learners are said to "learn passively when their primary role is to listen to an authority that organizes and presents information and concepts. Active learning occurs when students do more than listening" (Hess, 2015, p. 401). *Doing* (action)of students in a classroom for example, doing chemistry practical in a school cannot always be characterized as an active learning unless the acts trigger learner to think what they were doing it for. While citing Good & Brophy (1989), Kyriacou (1992) said: "active learning involves providing pupils with an opportunity in which they raise their own questions and use teachers and other resources to pursue self-defined goals" (p.310). The instructional material should have dearth to make learning active.

Use of Active Learning Techniques in PowerPoint

PowerPoint-based instructional material can add 'power' if it is incorporated with some active learning techniques; the 'tasks and activities prepared by the instructor in order to make students become involved' (Bak, 2011, p.2534). Anderson, Sharma and Taraban (2002) used some active learning techniques in their computer-based instructional package viz., interactive questions, short response interactions, coaching and experimental simulation. The present paper illustrates a few active learning techniques viz. conversation, leading question, example-problems, guided examples and quizzes, used in PowerPoint format in the development of instructional material on fission of a covalent bond.

Conversation

The slide or frame using 'conversation' as an active learning technique is shown in Figure 1.
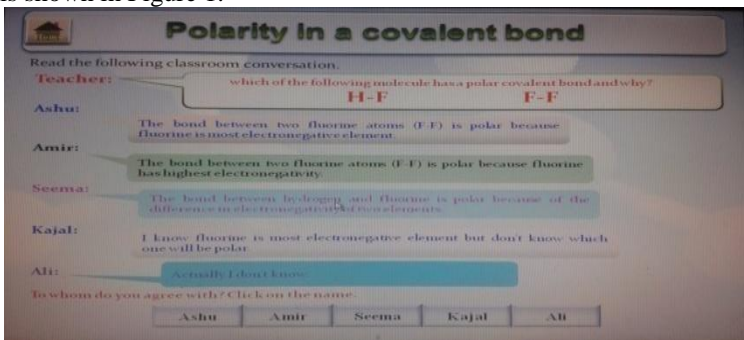
Figure 1: Screenshot of conversation

The conversation slide contains readymade classroom conversation. One of the intentions of the techniques is to check students' previous knowledge and give them treatment in accordance with their action. The learner is asked to click on any of the name button to whom he or she agrees shown at the bottom of slide (Ashu, Amir, Seema, Kajal and Ali as shown in Figure 1) which are hyperlinked with another frames/slide: remedial slides or the next lesson slide. On clicking the button, learner is taken to appropriate slide (the remedial slide or the lesson slide). Besides giving autonomy to the learner, the psychology behind using such techniques is to evaluate the learner's prior knowledge and to provide appropriate treatment. *Doing* (clicking) on the name button the learner is less conscious about his or her own evaluation.

Leading question

Leading question produces cognitive dissonance or disequilibrium in learners. It also used to arouse interest in the lesson. The leading question triggers students' thought and provokes them to explore content. A sample slide showing leading question is in Figure 2.
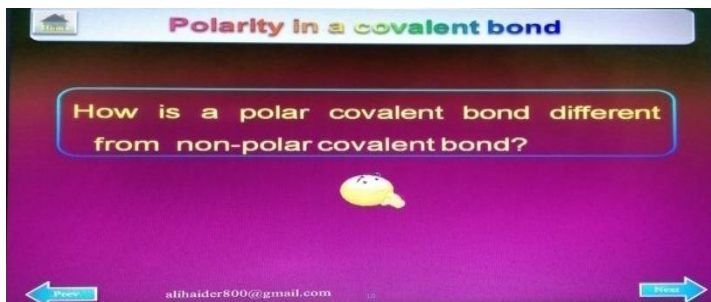
Figure 2: Screenshot illustrating leading question

Example-problems

Example-problems as active learning techniques are used for explaining content and extending knowledge. Another kinds of example-problems is shown in Figure 3. On clicking on the options, students are provided an immediate feedback; an explanation for their action.
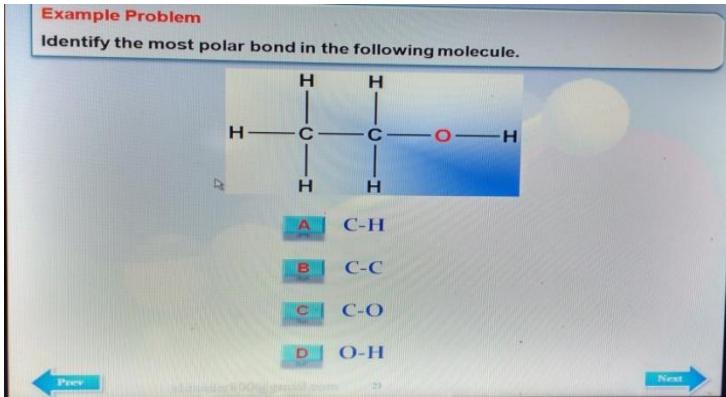
Figure 3: Screenshot illustrating example problems.

Guided example

The sample slide is shown in Figure 4(a) which presents static view of the problem. On clicking the explore button, dynamic view of the problem is shown (Figure 4b). Both static and dynamic of the same problem was put on the same slide so that learners can establish a relation between representational and micro level aspect of the concept without their attention loss.
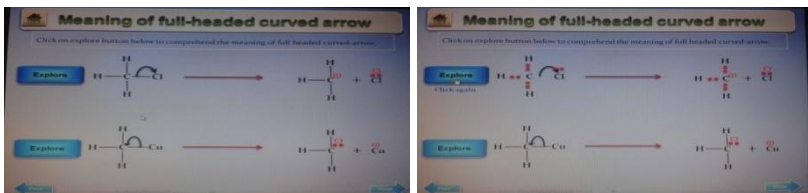
Figure 4: (a) static view before click   (b) dynamic view after click

In guided examples, animation is used which aimed to make the content simple, self explanatory and interactive.

Quizzes

The quizzes as active learning techniques are of three types: Beginning-quiz; Mid-lesson quiz, end-unit quiz.

- Beginning quiz: short and recall type of quiz at the beginning of lesson to stimulate prior knowledge.

- Mid-lesson quiz: short and multiple-choice type of quiz at the mid of lesson to strengthen the new knowledge for longer retention.
- End-unit quiz: included various type of quiz items (e.g., recall; short; multiple-choice) for strengthening retention and self assessment purpose.

The provision of immediate feedback was special feature of the quiz. A sample frame of one of the kind quizzes is shown in Figure 5.

Figure 5: Screenshot illustrating computer-based interactive Quiz

Pause procedure

Intentionally, one of the slides stating a dialogue 'think what you have learnt?' was introduced at the end of each topic. The purpose of the pause slide is to make students think what they already learnt. While piloting, it was observed that students shared their knowledge with peer reaching at this slide.

Figure 6: Screenshot illustrating pause slide

Conclusion

The development of instructional materials in chemistry is important. Effectiveness of such material can help student lead abstract ideas to be learnt. This paper describes practical ways of designing computer-based instructional material in chemistry on 'fission of a covalent bond' based on PowerPoint format using active learning techniques. Ideally,

designing of the 'best' PowePoint-based instructional material cannot be attained. The qualifier 'best' may not be same for every learner who differs in learning styles and characteristics. Keeping heterogeneity and context in mind, relatively better instructional materials can be designed and developed by a teacher. Teacher-made instructional materials have additional advantages because a teacher can apply his or her expertise in content, pedagogy and technology in the development of materials. Active learning techniques have wider applicability as they have potential to engage learners in purposive tasks.

Acknowledgement

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E-Learning: Trends and Challenges in the Educational scenario in India

Jessy Abraham

Professor

Department of TT&NFE, IASE
Faculty of Education, Jamia Millia Islamia, New Delhi
E-mail: jss.abraham@gmail.com

Abstract

This article gives an overview of the challenges and opportunities that the e-learning platforms provide to the learners who are 'digital natives' facilitated to learn by 'digital migrants' in an environment which is highly competitive and demanding. India has programmes like 'digital India' and policy initiatives like ICT policy for school education, Skill Development Policy and new education Policy which could set the stage for changing the way we teach and learn. This paper deals with e-learning platforms available and the opportunities that the learners can avail and also the challenges that we have to overcome with implications for policy makers and stakeholders.

Key Words*: E- Learning, unique features of E-learning, Trends, challenges, Educational scenario in India*

Introduction:

The use of Information Communication Technology (ICT)in the field of Education at all levels of schooling as well as higher education in all settings such as formal, non-formal and informal has resulted in providing many opportunities as well as challenges. The potential of the ICT to reach the unreached with quality education, providing skill education to the unskilled has been proven empirically and hence ICT is now recognised as a very crucial tool for development by many countries including India. There are many government initiatives through programmes like Computer Literacy and Studies in Schools (CLASS), IT School, CALtoons, National Repository for Educational Resources (NROER)and private initiatives like Intel Teach to the Future, Edu Comp ,Khan Academy to name a few. Now at present the

Digital India Programme, the Skill Development Policy, ICT for School Policy together make a conducive environment in which the potential of the ICT could be tapped through right practices. The use of internet and interactive whiteboards in the classrooms in India is going to increase every day. These technologies could be integrated not only to the traditional classrooms but also to distance education. The term E-learning is used for all contexts of learning facilitated through internet or intranet.

In order to tap the potential of e-learning, we need to understand its potential to the traditional and distance educational contexts as well as the challenges such as geographical vastness of the country, its diverse languages, urban rural disparities, lack of infrastructure, poverty and illiteracy. If we wait till when we solve issues related to infrastructure, poverty and illiteracy to tap the potential of e-learning, it will be too late. Therefore, the government of India has taken initiatives such as E-basta , E Pathshala,Saransh, Shaala Siddhi and other ICT programmes.

The digital India Programme launched by the Honourable Prime Minister Mr. Narendra Modi in 2014 is a flagship which merges many schemes involving several ministries and Departments of Government of India in order to transform India into a digitally empowered society and knowledge economy centring around three aspects namely (i) Digital empowerment of citizens ii) Digital governance and services and (iii) Digital Infrastructure. This could result in having all our classrooms in schools and higher education institutions in villages and cities across the country to have internet access. If digital India is implemented as per the schedule, all the citizens of the country may have access to internet and universal phone connectivity by 2019.

The skill development policy of India (2009) and the skill development policy and Entrepreneurship (2015) have endorsed the ICT competency as a major enabler for the youth for employment. This policy when implemented well could help our youth empower themselves with necessary competencies to use Information Technology (IT) skills.

The ICT policy for school Education (Government of India,2012) aims at enabling the youth to participate and sustain in the development in a

knowledge society by equipping it with ICT skills by providing ICT enabled teaching learning process. The implementation of the policy has resulted in increased availability of Computers and Internet in the schools for teaching and learning.

Government of India (2016) in the inputs for the draft of the New Educational Policy 2016 also has given adequate emphasis to ICT integrated curricula across stages and levels. When we put all these policies and the initiatives in the area of ICT integration we could infer that e- learning is an emerging trend in India also as in the case of many developed and developing economies in the world.

E- Learning

The term e- learning is defined by many authors," the use of digital technologies and media to deliver, support and enhance teaching, learning assessment and evaluation." (Armitage and O'Leary,2003) is a widely accepted one.

As Sener(2015) has defined e-learning on the basis of certain key characteristics at course and programme levels taking into account the parameters such as model of delivery, time and flexibility.

At course and programme levels, the classes are scheduled through computer usage. For instance through computer simulation instead of actual lab, work or classes are distributed through synchronous web conferencing where students access the class in real time from remote locations or in a web enhanced course which gives some additional information through internet. These courses combined traditional classroom instruction with online learning which are known as blended model or hybrid model.

The e-learning platforms are suitable for distance education. The distance education has passed through four generations ; the first generation of correspondence model, second generation of multimedia model, third generation of Tele-learning model , fourth generation of the Flexible learning model and fifth generation of intelligent flexible model due to advancements in ICT. (Taylor,1995,1999).

Initially only print resources were available, later audio and video tapes and Computer based learning and C.Ds were available. Later audio tele conferencing, video conferencing, TV Broadcasts, Radio programmes were available. The flexible learning model and intelligent flexible model use interactive multimedia, internet based resources, computer mediated communication using automated response system. Now Learning Management Systems and Computer Managed Systems are being used to provide learning environments to suite each learner.

Virtual Universities and schools, use of social media in teaching and learning are examples of E- learning platforms. In India, most of the open universities use printed materials and web conferencing, teleconferencing to support the learning. Dedicated broadcasts through radio and television are also utilized. The IPICT course conducted by NIIT is an E- learning opportunity for teachers. The course is conducted in online mode where the students get identification (id) and a password to access the course materials, after completing each module the assignment is submitted online and the feedback is given by the mentor. After incorporating the suggestions given, the learner has to upload the file again. Once it is accepted the next module is given to the learner.

Unique Features of E- Learning:

As it provides for self-paced learning and, it could be custom built according to the interests, needs, and skill levels of learners. It could suite multiple learning styles of different learners. Most crucial feature of e-learning is that the Geographical barriers are eliminated, opening up broader education options. There could be flexibility in time as it is accessible on 24/7 which makes suitable for people who cannot attend classes due to work or health reasons. As the learner can login as he /she desires learning can happen precisely when needed

e learning could also save the Travel time and associated costs (parking, fuel, vehicle maintenance) and can cater to many more number of students than the ones of traditional face to face mode.

E learning is suitable professional development programmes of teachers as the teachers could study side by side and improve their competencies.

http://www.worldwidelearn.com/elearning-essentials/elearning-benefits.htm

Key Trends in E-Learning in 2016 and Implications for Teacher Education

According to Williams (2016), there are seven key trends in e- learning for 2016. Cole(2016) and Docebo (2014) and Connor,2016) has also given trends and forecasts regarding e-learning.

1. **Automation**: The automated solutions are to suit the learner's requirements for courses and learning materials, saving the time and money. Adobe LMS is one such example through which online courses can be delivered. The "Smart Enroller" makes the online assignment according to the learner's requirements. There is a provision for revision of content and tracking the learners' progress. The in-service teacher education programmes could be delivered through automated Learning Management Systems. The individual teacher could be encouraged to do self learning through such LMS programmes.

2. **Augmented Reality**: Increased use of augmented reality devices in e learning by means of QR codes or mobile technologies like Apple Watch or Google Glass to provide learners environments with action-based functionalities in real life conducted with GPS tracking. The Geolocation feature of the online programmes allows the developers design region specific e-learning templates. This feature when added to online programmes could make the content suitable for different locations in India.

3. **Big Datavs Micro learning**: As more user generated data is there analysis of the data becomes more crucial. Mini Bytes of learning content is provided to the learner with 5-10 minute video or single page content is provided.(Connor,2016).

In You Tube, we find many videos on specific learning tasks. More on line depositories on different learning tasks by practicing teachers and teacher educators are likely to be uploaded.

4. **Cloud Computing**: More e- learning platforms will use cloud computing.Cruz (2011).Cloud computing is a collection of applications and technologies which can be accessed and manipulated by a large number of users in real time. The Cloud is changing the way educational institutions, teachers, parents and students interact and collaborate. The information needed or software needed can be accessed and used any time. Within the Cloud solutions universe, Software-as-a-Service (SaaS) is playing a major role.(Docebo,2014). A costly software could be made affordable through cloud computing.

5. **Gamification:** E- learning will open more opportunity to integrate games in the learning process. There are many educational games which are very popular. Ten examples are given by Youkai-Chow:

"Duolingo" is an online collaboration which combines a free language-learning website with a paid crowdsour, "Ribbon Hero" for learning Microsoft Office, "Class Dojo" for improving classroom behaviour, "GoalBooks" to track the learners individual learning plan, "World peace game" for teaching politics, "Coursera", "Mr. Pai's class", "coursehero", "brainscape" and "socrative" formaking game space race.Teacher education programmes have included many of these programmes as part of the curricula.

6. **M-Learning**: The concept of m-learning (the use of mobile devices to deliver education anytime anywhere) could be a boon for India's education sector, especially in the field of adult learning. (Raman,2015) According to a recent study, Indian users, on an average, spend 3 hours and 18 minutes every day with their smartphones. There is a possibility of using mobile phones to revolutionise the Indian education sector, usingm-learning or mobile learning. India has the second largest mobile phone user subscription base in the world, with over 900 million mobile phone

users. Mobile devices have good penetration even in rural areas where other infrastructure does not exist. This growing ubiquity of mobile phones, the widespread availability and adoption of mobile broadband technology and market penetration of low-cost smartphones also hold key promises for the use of mobile technologies for education delivery in India.

Though mobile phones are capable of communication it has following features to make it suitable for teaching learning:

1. **Voice —** Audio inputs could be used to learn languages, literature, public speaking, writing, storytelling, and history amongst a whole range of topics. TED talks, songs are taught through audio recording. Teacher education programmes now use this aspect of the mobile.

2. **SMS —** Widely used in India, literally billions of short text messages are sent over the phone networks. Nowadays 'Whatsapp' messages are used for sending pdf file to support classrooms. Teachers could use the concept of flipped classrooms where the reference material is forwarded to students' groups with key questions and the classroom will be truly interactive as the learners try to find the answers and discuss it in the classrooms.

3. **Graphic Displays —** Phones can be used to display words, pictures and animation and be similar to personal computers and can be used for teaching wide range of topic. Students could be asked to generate content by preparing video clipping as part of assignments .IT@school IT syllabus has already included this in their syllabus. Teachers of States like Kerala are trained to use the graphics in the teaching learning process using Free Software and the GNU/Linux operating system and applications

4. **Downloadable programs —** With mobile phones that have memories, and can accept and install downloaded programs, an entire new learning space is opened up on the phone. Almost any sort of learning content and interaction technology can be delivered to the phone using this method. Evernote" is such an application that can be downloaded and can be used for making notes, storing web clippings in the form of Pdfs, documents in file format that can be sorted and saved and used anytime the teacher of the learner. It has the feature voice to text feature where the

student can just record the lecture and convert it to text and the teacher also can just talk and create the note.

5. **Mobile Internet Browsers —** Internet browsers on the phone opens up all the learning resources available on the web, including Google, LMS applications, typical eLearning courseware and other tools/applications. Nowadays Skype, IMO are also used by teachers for online tutoring of students subjects like Music, mathematics and Sciences to learners situated in their homes

It is expected that the m-learning market in India will increase rapidly as the networks and technologies improve, the Jio is one such attempt in the right direction. The Reliance Jio SIM offers unlimited HD voice & video calling, unlimited SMS, high-speed data and access

6. The new trend towards **Bring Your Own Device (BYOD**) -- where individuals take their personal (usually mobiles, tablets, laptops) devices to workplaces is being implemented through Chrome Book, Akash Tablet, IPad, in the private sector of Schools . KVS was cooperating with Intel in a study on the effectiveness of Chrome Book. (Docebo, 2014).

But in India, in the government schools, through the 'ICT in Schools' scheme 'a component of the RMSA,150 smart schools shall be set up by State Government and UTs at the district level using a grant of Rs. 25 lakh for a schools and a recurring grant of Rs. 2.5 lakh per year. This would enable provision of at least 40 computers in each such school. State Governments of Tamil Nadu and UP provided Laptops to all plus two level students.

7. **Open and Virtual Universities:** E-learning in the open and virtual schooling system could assist the drop outs, rural youths, girls, women and marginalized groups who were not able to make use of formal schooling due to varied reasons. National Institute for Open Schooling(NIOS) uses e-learning resources for teaching such as Telecasts (GyanDarshan Programmes), Teleconferencing, media support through multimedia packages and Broadcasting of programmes (Negi and Yadav,2014).

The virtual schools and colleges are there in Europe, Canada, Australia and New Zealand. In India, we have Indian Virtual University for Peace(IVUP), Bangalore, BITS-Pilani Virtual University are just a few. More virtual University could be started in order to accommodate the need for good quality teacher education in collaboration with existing universities.

Mixed mode learning: As full time campus based learning is becoming less popular, a great deal of learning could take place off the campus through e- learning as in the Canadian Universities.(British Columbia Ministry of Skills Training and Labour, 1994)

8. **MOOCs changing to SPOC**: MOOC (Massive Online Open Courseware) are changing SPOCs. (Self-Paced Open Course). Instead of providing the same set of modules or course content in Self-paced open course the learner may choose the content and methodology and time required to complete according to his or her requirements within certain limits set by the course providing agency.

Challenges to E-learning and suggestions to tackle them

Though the concept of E- learning sounds very promising especially when we have more and students and teachers who have access to mobile technology and most of our schools have internet, if not present soon these schools may get access due to the initiatives of digital India programme, there are many challenges which cannot be ignored.

As India is a vast country geographically and in terms of its population, we need to build our infrastructure to meet the demands in data and technical support. Some of the challenges are described below:

Training in Technical skills at low cost: As on line teaching or integration of interactive technologies requires different set of skills than face to face mode, training of in-service teachers in ICT Competencies is of prime importance. More often ICT initiatives face problems due to lack of technical support, the training in trouble shooting to handle issues and also prevent problems should be given due emphasis. Teachers who get trained in ICT should be given access

to ICT by providing tablets or Laptop or desktops so that they keep using it .There are many applications GeoGebra,,Sunclock,Kalzium and Ghemical for teaching different subjects. Teacher training should cover applications that are suitable for them(Kumar, 2011).There are many agencies involved such as Educomp Solutions, Everonn Education, NIIT, Core Education & Technologies, IL&FS and Compucom, HCL Infosystems, Learn Next, Tata Interactive Systems, Mexus Education, S. Chand Harcourt (India) and iDiscoveri Education and S. Chand Harcourt are firms involved in training teachers and providing educational software. It is crucial for a country like ours with such a huge number of schools to develop in teachers the ability to develop course ware and be self-sufficient in order to cut the cost especially using open source software.

According to, Rahul De, ICT can result in increasing the reach [of education] and in keeping the costs low. "With increasing penetration of mobile phones and Internet kiosks, the potential is indeed immense," http://knowledge.wharton.upenn.edu/article/indias-education-sector-moving-toward-a-digital-future/

Time: Speed in implementation is another crucial element. If India is to benefit from the demographic advantage of having proportionately more youth below 35 years, we need to speed up the process of providing e- learning so that more people benefit from it. If ICT policy for school education is implemented within the time frame of digital India, it could make difference. As the task involved is enormous the role of NGOs

Mindset: There is the challenge of procrastination in the case of all distance mode or self directed platforms of learning due to lack of motivation this could be overcome with adequate planning to collaborate with peer under the guidance of mentors. Web based conferences could also provide the social environment which could boost the morale due to interaction with experts.(Singh,2012)

Awareness about positive effects: There is a belief that online simulations and experiences are not equal to real experiences and therefore it will not lead to application of the theory in practical

situations. In order overcome this challenge, those who provide e-learning environments should provide assignments in which the learners work on real situations and provide evidence for such experiences.

Security and Plagiarism issues: Digital security is another important challenge. Cyber bullying and cyber-crimes are increasing rapidly in academic institutions also. In order to overcome this challenge, all academic institutions should disseminate information regarding cyber laws and ethics and right practices. Another issue in the case of E-learning could be related to plagiarism, if the content used is not subjected anti plagiarism checks. Most of the institutions have their own checks now to take care of this

Proprietary software vs Open or Free Software: The use of proprietary software adds to the cost of the course development, therefore it is better to use Free software but more technical skills and competencies are required for this. If IT skills are part of the school curriculum as envisaged in the ICT policy for school education then, these issues will not be there.

Conclusion:

Here we are in the process of changing the way we teach and learn with the E- learning platforms in the form of open educational resources, increased availability of internet, smart phones, cheaper tablets, affordable laptops and desktops and Learning packages being developed by many private and government . Governments both central and states should improve the cost effectiveness of technology by involving all stakeholders. The time is apt for building networks and collaborations among institutions in order to break the barriers in effective use of e- learning opportunities available. Though we have many private corporate initiatives in Universities to make the good the better, we need public institutions that help develop social and ethical skills as well as vocational skills for the underprivileged and the unreached to provide an equitable environment. Though technology is not the answer on its own, but it does have the potential to allow institutions to adopt and change for the better.

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Language Development and Technology Integration in Inclusive Classrooms for Effective Inclusive Instruction

Quazi Ferdoushi Islam

Assistant Professor

Dept. of Educational Studies,

Faculty of Education, Jamia Millia Islamia, New Delhi

Email: qfirdaus2000@yahoo.co.in

Abstract

Language is constructed in a socio-cultural environment. Social Interactionist theory is an explanation of language development which emphasizes the role of social interaction between the developing child and linguistically knowledgeable adults. This is based on the socio-cultural theories of Vygotsky and Bruner. Scaffolding is frequently provided in the form of instructive correction: certain questions form the backdrop of language and inclusive education for providing holistic development:

- *What skills and abilities are required of teachers in planning classrooms for universally designed curriculum?*
- *What strategies can be used for language development?*
- *Can technology build relationship between vocabulary and concept development and support inclusive instruction?*

Hence, it is pertinent in such a scenario to address the issues of language and curriculum adaptations. The paper will attempt to highlight the relationship between vocabulary and concept building and the challenge for teachers in inclusive classroom settings to design and deliver high-quality, effective instruction that will allow heterogeneous group of students to learn and retain important information (Brownell at. Al., 2012).

Key words: *Language, vocabulary, curricular adaptations, Inclusive education*

Language is a powerful medium of social exchange. It initiates the process of communication. It bridges the gap between and among people and social cohesion depends on the language used. The educational landscape in the country has undergone rapid

transformation owing to significant developments in the field of education. Many landmark legislations have come up regarding penetration of education among various strata of society. This has at once raised hopes of millions of people belonging to different socio-economic status in multi-cultural country like India.

Language also creates social differences and hierarchies. Inclusive education is about one, big grand embrace ignoring all differences. The role of language is paramount in the sphere of education as it is through this medium it touches base with the scholastic and co-scholastic aspects. Children with language related impairments specially the hearing impaired should be introduced to the sign language. Braille scripts for literacy of the visually challenged calls for all inclusive schools to be Braille ready. Language in education needs to build on this resource. Language can be vocalized as in speech or manual as in sign. The human language capacity is represented in the brain.

Language acquisition is the process by which humans acquire the capacity to perceive and comprehend language, as well as to produce and use words and sentences to communicate. Language acquisition is one of the quintessential human traits, because non-humans do not communicate by using language. Language acquisition usually refers to first-language acquisition, which studies infants' acquisition of their native language. This is distinguished from second-language acquisition, which deals with the acquisition in both children and adults of additional languages. Language gets socio-culturally constructed. Social Interactionist theory is an explanation of language development which emphasizes the role of social interaction between the developing child and linguistically knowledgeable adults. This is based on the socio-cultural theories of Vygotsky and Bruner. The theories emphasize the role of feedback and reinforcement in language acquisition. The child is given guided activities and scaffolding is provided. In language development, it signifies that a child's linguistic growth offshoots from modeling of and interaction within the zone of proximal development with parents at home, adults in the immediate environment and teachers in school. Scaffolding is frequently provided in the form of instructive correction: certain questions form the backdrop of language and inclusive education for providing holistic development:

- What skills and abilities are required of teachers in planning classrooms for universally designed curriculum?

- What role language plays in interpreting assessment data in inclusive classrooms?
- Can technology build relationship between vocabulary and concept development and support inclusive instruction?

Ground Realities: Existing Scenario

Language cuts across curriculum and is so central to the teaching – learning process. A Times of India report of New Delhi edition, on 5th January 2015 titled "Most disabled kids in CBSE exam from city" states that there is a steady rise in such candidates since 2009. The categories of students who took the exams included, "autistic, dyslexic, visual and hearing impaired, locomotor and intellectual disabled".

The same report also mentions "Inclusive education is strong in Delhi" opines George Abraham of NGO Score Foundation, which brings out of school children to the mainstream education. Further it is stated "that there are more visually challenged students in mainstream schools in Delhi than in any other places in the country. Delhi is more education-friendly, more aware and facilities such as support services, availability of reading material and trained teachers. Sarva Siksha Abhiyan, Right to Education Act(RTE), 2009 and the 3 per cent reservation in government jobs to the special needs category has opened the door of opportunities to the marginalized and disadvantaged including children with special needs (CWSN).

All human beings have unlimited potential. This is the basic crux of Human Resource Development. In wishing Indians a happy and a prosperous New Year, The President of India urged everyone to dedicate themselves to an inclusive society. Social cohesion is an essential pre-requisite for national development and growth. If there is skewed participation of all children from different sections of society, as a consequence it will derail the government's development agenda of inclusive society.

Here it is Pertinent in such a Scenario to address the issues of Language and Curriculum Adaptations.

The capacity to successfully use language requires one to acquire a range of tools including phonology, morphology, syntax, semantics and an extensive vocabulary. Fluent readers are able to rapidly and effortlessly able to process such information. Students with disabilities are typically less fluent readers hence it impacts their writing too.

To think and reason well, children must be able to form concepts, problem-solve, use rules, think logically and critically, create and brainstorm ideas and represent ideas in their mind **(Levine, 1998).** Students build on their previous knowledge. Students form ideas about concepts through words, vocabulary and they use vocabulary again to extend, define and refine their knowledge. Concept learning also improves students' ability to extract meaning from texts and is associated with improved comprehension **(Snow, 2002).**

In addition to understanding the nature of simple and complex concepts, it is also important to understand that people tend to group and sort information based on their interests, beliefs, values and experiences. How concepts are defined and classified by students have implications for teaching and later learning **(Brownell et. al., 2012)**. A concept may mean different things to different people.

Relation between Vocabulary and Concept/Learning Development:

Words (vocabulary) are used to label concepts. Students learn new words in relation to concepts represented by familiar vocabulary. If a concept is understood well, students can come to understand unknown words associated with the concept by tapping into their prior understandings. If the concept is not understood well, and a new word is taught, the new word will most likely be forgotten within a few days **(Kame'enui, Dixon& Carnine, 1987).**

Research indicates that students with mild disabilities often struggle to learn because of difficulties attending to, processing, storing, and or retrieving information. Specifically, they may possess inadequate content and vocabulary knowledge because of deficiencies in language production, such as problems retrieving words from memory. They may also lack proficient reading skills, resulting in less time spent learning concepts and words through independent reading (**Baker, Simmons, & Kame'enui, 1998; Stanovich, 1986)**. Students with disabilities need more support. The challenge for teachers in inclusive classroom settings is to design and deliver high-quality, effective instruction that will allow heterogeneous group of learners of students to learn and retain important information **(Brownell at. Al., 2012).**

Planning what to teach occurs at different levels (e.g. grade-level concepts, unit-lesson concepts, daily lesson plan concepts) and in response to students' needs **(Muller, Sharma, & Reimann, 2008).** Researchers have developed many classroom-based techniques for

teaching vocabulary words **(Beck, McKeown, & Kucan, 2002)**. In deciding what to teach, teachers must consider the utility of concepts and associated vocabulary words. Categorizing words into three tiers can be helpful for deciding what to teach. Tier one words are basic words, such as shoe and jump, and require little instructional attention. Tier two words are words that appear frequently in grade-level material and have potential for enhancing students' reading comprehension, oral language and written expression. Tier three words include words children encounter infrequently and are best taught when related topics arise during content instruction **(Beck et. al., 2002)**. Hellen keller was taught to finger spell by her teacher Anne Sullivan. Words were written on her palm and the object of association was placed on her hand. E.g.

D-O-l-l. We need examples from the Indian case scenario.

Researchers have identified strategies that offer strong support for improving student performance in reading and writing. These strategies have been researched both in general and special education classrooms. Research –based strategies in Reading, Writing: **(Brownell et. al., 2012))**

Reading:	**Writing:**
• Prediction and activating prior knowledge	Planning strategies
• Think-alouds employing self-questioning	Organizing strategies
• Mental Imagery	Sentence-writing strategies
• Summarization	Revision strategies
• Strategies for learning text structures	
• Word identification strategies	

To promote students' ability to regulate their own learning when using strategies, teachers should help students set goals for learning a strategy and then assist them in monitoring how their performance improves as a result of using the strategy **(Reid& Lienemann, 2006).**

Teachers are the best judge of which strategy to use for a CWSN as the teacher can identify the strategy based on the student's response.

How can Language help with the Assessment Data?

After a teacher has identified which strategy to use, along with the team of professionals (if required) teachers should develop goals for learning and using the strategy.

As Brownell &et. al says goals should be achievable in a short period of time. For e.g., a student could commit to using the summarization

strategy every day for 1 month in order to increase his or her comprehension scores on weekly reading quizzes. Students could then create a chart that helps them keep track of how much they used the strategy.

How Technology can build Relationship between Vocabulary and Concept Development and support Inclusive Instruction?

Technology can be a powerful tool for concept development. Teachers can use technology to assist students in organizing the different types of concepts (e.g., simple, complex), both in terms of learning and identifying objects as well as observed actions. Technology tools can further represent concepts by offering a visual support; allowing the student to recognize and understand the common features of events, actions, or objects; and basically break down complex concepts or unknown simple concepts.**(Brownell et.al., 2012)**

Web 2.0 resources can be used effectively to support technology integration into inclusive classrooms.

Technology can be used by teachers during guided practice as well as with independent practice in the case of CWSN. Teachers can model the use of technology and assist students who are struggling to use technology as a measure of scaffolding. With the option of availability of emerging multiple technologies to support CWSN , during learning or reading comprehension , li**ke Thinking Reader** (a software program that provide instruction in seven reading comprehension strategies e,g, summarization, prediction, clarification etc.) developed collaboratively by The Centre for Applied Special Education Technology And Tom Synder Productions. Another software program called **Read and Write 3 Gold** teachers can use to teach strategies for summarization or note-taking.

Conclusion

India's vibrancy regarding Inclusive education depends on initiatives taken by states and hopefully one gets to see effective feasibility measures of inclusion in the coming years. But it is too early to hit the ground running and expect palpable change almost immediately. On the upside, government plans outreach to CWSN through important legislations made. This is all welcome. Passing the Rights of Persons with Disabilities bill into an Act will allow the issues in Inclusive education so apparent to be considered and addressed calmly. But questions that remain are whether it will be accompanied by supporting

language curriculum adaptations and experiments in innovations are required in the Indian context of inclusive education.

Hopefully we can cover much ground with technological innovations in inclusive educations with the launch of our PH Modi ji's ambitious "Digital India" initiative.

Inclusion as a philosophy is a value which is to be practiced. Inclusive development cannot be at conceptual odds with mainstreaming. Sabka saath, sabka vikas as reiterated by our Prime Minister Modi ji cannot take place if "all children" under RTE Act 2009 does not take into account our most vulnerable group.

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ICT and Andragogy: Experiments in India

Shikha Kapur

Ѕenior Assistant Professor
Department of Adult and Continuing Education & Extension
Jamia Millia Islamia, N.D.-110025
Email: skapoor@jmi.ac.in

Introduction:

Marshall McLuhan (1964) referring to world as a 'global-village' means the instantaneous movement of information made possible due to electric-technology, has contracted the globe into a village. We are part of information-society today where there is a fast interchange and exchange of ideas, information and innovations. In technology-driven societies it is imperative that information-exchange between the sender and receiver occurs quickly. The Information technologies have left significant effect and impact on the quality of human-life (Akpore, 1999). Those societies that have optimally used ICTs have precipitated social-change, economic development, raised levels of education, living-standards of people, work-patterns, recreational activities and even nature of markets.

What then is ICT?

'ICT' is an acronym for Information and Communication Technology/ies. It refers to an all encompassing term which includes 'product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form[9]. ICTs include various communication devices, services, applications as radio, television, telephones (cellular/fixed), computer and network-hardware and software, email, videoconferencing, satellite-systems. ICTs have been the very basis for human existence since times immemorial which has driven man to seek ways of processing information and communicating irrespective of distance and on real time basis (Ndukwe, 2002). ICTs have been the bedrock for survival and development of any nation.

What is Andragogy?

Term 'Andragogy' was a introduced by Knowles since he believed that adults learn differently from children. When translated from Greek it means "man-leading". "Andragogy is the art and science of helping adults to learn" (Knowles 1973). Rather than following 'didactic-approach' it emphasises 'problem-centred approach' where equality exists between the teacher/facilitator and learner. Learning is collaborative between the two. Adults learn best when they have control over their learning and in andragogy the focus shifts from the teacher to the learner. (Kapur, 2015). Basic assumptions of andragogy is that adult learners are motivated to learn when there is need, prefer self-directed learning and their

teacher manages the learning process, facilitating acquisition of content while adult-learners have control over their learning.

Andragogy and ICT

It is important in process of curriculum-designing andusing ICTs, e-learning, online-learning, that the content-developers translate the andragogical aspects into the ICT medium. Beaty et.al. (2002)[1]propose that ICTs should support collaborative interaction, dialogues and information rich resources. Therefore a collaborative relationship should exist between the adult learner and teacher in construction of content.

Andragogy and Adult Literacy

Andragogy explains how adults learn. It is probably the best-known theory of adult-learning both within and outside the field of adult-education (Merriam, 2004). Andragogy is the study of adult-education theory, processes and technologies. It includes adult-literacy/ adult basic-education, higher and post-school and/or university education, the professional/vocational education to continuing education, human resource development, whereby persons regarded as adult develop necessary skills, gain/improve knowledge and change attitudes that leads to well-rounded balanced educational, social, economic and cultural development.

Adult Literacy or literacy-education pertains to teaching or acquisition of reading, writing and numeracy skills to prepare persons to function in society (UNESCO, 1992).

Adult Literacy in India: Some facts

The 2011 Census revealed that in the last decade overall Literacy-rate has grown by 9.2 percent points i.e. 64.84% in 2001 to 74.04% in 2011. The male literacy-rate has grown by 6.88 percent points i.e. 75.26% in 2001 to 82.14% in 2011, while female literacy-rate has grown by 11.79 percent points i.e. 53.67% in 2001 to 65.46% in 2011[3 & 4]. Number of illiterates (7+ age-groups) decreased from 304.10 million in 2001 to 282.70 million in 2011[4]. Kerala, the only state in India has 100% literacy-rate. Of the total 774 million illiterates in the world, 37% illiterates are in India (UNESCO, 2014). Inspite of six-times increase in literacy-levels in India (74.04% in 2011) since the end of British rule (12% in 1947) there are some striking facts about illiteracy in India[7].

- India has the world's largest population of illiterates.
- India is ranked 123rd out of 135 countries in female literacy-rate.
- Bihar, Jharkhand and Uttar Pradesh are amongst the bottom five-states in terms of literacy of Dalits.

ICT and Adult Literacy in India

The use of ICTs can contribute to universal access to and equity in education, delivery of quality teaching-learning[8] and learning relevant to life. ICTs are engines of growth for global economy and have potential to enhance public awareness, contribute to sustainable economic development, nourish diversity and foster international peace & stability (UNESCO, 2014). The ICTs have ushered in a rapid change in peoples' lives especially in the education sector.

Considering the fact that 1/3rd of the world's illiterates are in India, Indian Government has to work concertedly to combat illiteracy time-bound and well-planned manner. Adult literacy is one end of the continuum of education whereas lifelong learning is the other.

The National Literacy Mission an important societal and technological mission launched in 1988 intended to impart functional literacy to 80 million adult-illiterates between 15-35 years. (MHRD,1988). In context of technology mission, modern electronic medias and ICTs were applied for imparting literacy and improving teaching-learning process. And for the first time in India radio, television, video-cassettes were used for adult literacy.

ICT and Adult Literacy in India: Some Experiments

- **Experiments using Radio**

Project in Radio Education for Adult Literacy (PREAL):
NLM and the All India Radio launched Project in Radio Education for Adult Literacy (PREAL) in 1990 for women beneficiaries primarily in 17 technology demonstration districts located in 4-low literacy, Hindi speaking States of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh. Radio-cum-cassette recorders (two-in-one) were provided to 3600 adult education centres. Twenty six radio lessons of 15-20 minutes duration each were prepared with the title "*Nai Pehal*" with three-parts "*Suno-Bolo*" (listen and speak), "*Suno-Dekho*" (listen and see), "*Dekho-Padho*" (see/decipher & read-aloud). Radio reader or *Aakshvani-Paathmala* supported the radio broadcast and was used simultaneously with 'weekly-broadcast' and 'repeat-broadcast'.

Development and Educational Communication Unit (*DECU*) and Indian Space Research Organization's (ISRO) evaluation of PREAL revealed that although radio lessons were interesting, software effective, instructors well-trained, there was marginal acceleration in literacy through radio-broadcast. Problem was poor Project management, poor radio set maintenance, lack of timely distribution of radio primers to the adult-education centres, poor learner attendance, poor monitoring & supervision and the confusion among States due to shift from centre-based approach to campaign-approach (Agarwal et.al., 1993).

- **Experiments using Television**

Khilti Kaliyan **(Translation: Blooming Buds)**
*Khilti Kaliyan*a Pilot Project comprising of 24-episodes weekly TV-serial was telecast on Delhi Doordarshan. It was based on experimental literacy primer*Khilti Kaliyan* and hence the name for women the age-group 15-35 years. The serial focussed on social, economic, political issues related to oppression, deprivation and marginalization faced by women to kindle need for literacy in them. However, lack of coordination, training of instructors, poor infrastructure and management of project led to its withdrawal.

Chauraha **(Translation: The Cross Roads)**
In 1992 a 40-episodes tele-serial *Chauraha,* of 15-minutes duration each was telecast on Doordarshan for adult-literacy. The Directorate of Adult Education (DAE) partnered with the State Resource Centre, Jamia Millia Islamia (SRC, JMI) and conducted the 6-months long UNICEF-sponsored experiment. The goal was to teach reading and writing of *Devanagri* (Hindi) to illiterate-learners. Each episode had a

narrative storyline and was high on emotions, incorporating awareness on development issues using 'learning by association' where everyday images were superimposed with the Hindi letters that were taught in the episode.

Though *Chauraha* could not generate a large viewership since its repeat telecast was at an inappropriate time with no prior telecast publicity/ advertisement! The link between *Chauraha* telecast and the literacy-teaching at the adult-education centres was amiss. Lack of appropriate infrastructure, training of instructors and volunteers and additional reading materials on *Chauraha* led to limited success (Ghosh, 2006).

However SRC, JMI's assessment indicates significant difference in literacy achievements (writing skills) among learners of literacy-centres wherever *Chauraha* was screened on television (telecast) or VCR (non-telecast mode) as compared to learners from adult-education centres where no screening was done.

- **Experiments using Satellite based Communication System**

Jhabua **Development Communications Project (JDCP)**

The Jhabua Development Communications Project (JDCP) used satellite-based communication system for illiteracy, health, education, watershed management, agriculture, natural forestry and local governance issues. Launched in the November 1996 by DECU of the Space Application Centre (SAC) in Ahmadabad it catered to the rural illiterate tribal population in the hilly hinterland of *Jhabua* District of Madhya Pradesh. Though the district is characterized by rich natural resources but the people here are the poorest in the state, with a literacy rate of 15% (then; 43.3% now[4]). High infant mortality rate, agriculture as primary occupation, poor transportation and communication facilities further aggravated their condition.

JDCP used interactive satellite-based broadcasting network for education and development of this remote area. Every evening for two hours DECU's Ahmadabad Studio was uplinked through satellite with 150 direct-reception systems like satellite dish, TV sets, VCRs. More than 12 talkback terminals were installed in each of the block headquarters of Jhabua district, through which village functionaries asked questions, provided feedback and reported their progress. The programs were made with active participation of local people with downward and upward information flow. Interactive training programs

were conducted every afternoon through the talkback terminals with various village functionaries like teachers, *anganwadi* workers, handpump mechanics and local *Panchayat* members. With the help of local NGOs, district, State and Central Departments Officials significant gains led to the Project being continued till 1999 by DECU.

- **Experiments using Computers**

Commonwealth of Learning Literacy (COLLIT) Project

The Commonwealth of Learning (COL) received support from the British Department of International Development (DFID), to undertake a 3-year pilot project in India and Ghana to explore how literacy programmes could be enhanced by use of ICT. Initiated in July 1999 the 'technology-based community learning centre' model was implemented and managed by community members through community-based learning centres. Aim of COLLIT was to facilitate learning by developing locally relevant learning materials. The staff and facilitators operating the learning centre had no prior exposure to computers and ICTs. At the end of the project there was a sea-change and they emerged as well-respected ICT-trained literacy instructors, experienced and well-versed in using ICTs and developing locally relevant instructional-materials. Additionally COLLIT project also demonstrated that learners used ICTs to not only achieve educational goals but also applied it to other facets of their lives (*Farrell, 2004).*

Tata Computer-based Functional Literacy programme

Launched in 2000 in Village Beeramguda, Medak district of Andhra Pradesh, the Computer-based Functional Literacy (CBFL) program uses delivery of multi-media lessons through computer software, animated graphics, multimedia presentations and flashcards. Based on theories of cognition, language and communication this method primarily focuses on reading, designed to provide basic 300-500 word vocabulary to adults over the course of 40 hours- which is one-third of time taken in a traditional training class comprising of 15-20 adults. CBFL has been field tested in five of India with the help of government and NGOs. According to Tata if implemented properly, CBFL can make 90% of India literate in 3-5 years, thereby transforming the third-world work-force.

TARA Akshar- *Angoothe Se Kalam Tak* **(Translation: From Thumb to Pen)**

TARA Akshar a laptop based functional-literacy programme is TARAhaat Information and Marketing Services Limited ICT initiative

of Development Alternatives (DA) Group[10]. With 100-minute a day 30-days classes, this group trains an illiterates to read and write and do basic mathematical calculations. Till 2016 400 million illiterates and semi-illiterates have become literate[8]. The software uses (i) memory hooks/advanced-memory techniques using animated movies (ii) rapid-fire video gaming concepts for learning reinforcement (iii) using 'Synthetic Phonics,' in which the letter sound teaching is followed by blending sounds to achieve pronunciation of the whole words.

Observations and Recommendations in the use of ICT in Adult Literacy

1. Although India has the largest number of world's illiterates (37%)[6], the problem of adult-illiteracy remains ignored and miniscule has been expended on adult-literacy(0.01% of the total-expenditure on education) (MHRD, 2014).

2. India is a giant in use of Supercomputers and communication technologies, ranking number four after United States, China and Germany[2], it's accomplishments however are not reflected in the arena of adult-education and adult-literacy since use of ICTS have been insignificant, inconsistent, inadequate and limited primarily to the small-level Pilot Projects funded by International and bilateral funding-agencies sporadically from time to time. And once the funding concluded these Projects could not be sustained.

3. It is strongly recommended hence to initiate self-sustaining Programs/projects like the TARA Akshar[10] that keep ground realities in India in mind and hence use indigenous strategies for achieving Adult-literacy through ICTs.

4. India is a land of diversities. Therefore the ICTs used in adult-literacy should skilfully integrate the regional and the linguistic variations.

5. Insofar ICTs in adult-literacy have relied mainly on the medias' like radio and television. It should now integrate use of computers. However computer use is restricted to formal school education and to some extent for adult learners in the higher education recently (Bhattacharya & Sharma, 2007; UGC, 2011).

6. There is hence a dire need to evolve strategies whereby 68% of the rural-illiterate population[4] should be brought in the ambit of adult-literacy through use of ICTS. Infect Prime Minister Narendra Modi's Flagship Program of Digital India "*is not meant for the rich but for those who are poor*" *(GOI, 2016). This program*

should not merely cater to imparting Digital literacy which will be of no consequences if the population is illiterate! So Digital India can form the umbrella that covers the adult-literacy program too for a wide coverage and positive results *rather than merely remaining on-paper, an inconsequential and failed Program for Digital literacy.*

7. A cadre of ICT experts/trainers well-versed and oriented with the literacy program should be drawn from all over India who can counter the lack of foresight in planning, implementation, monitoring and evaluation of ICT Projects under adult-literacy.

8. Inspite of leaps and bounds made by India in Supercomputers and now the Digital India Program, there is still remains a dearth of adequate telecommunication infrastructure/equipments, trained-manpower, proper power supply and transportation facilities that hamper the use of ICTs in adult-literacy.

9. Besides sprucing infrastructure appropriate adult-literacy reading materials should be developed, there should be ease in access and use of ICTs, so that motivation of facilitators as well as adult-learners is sustained.

10. Continuous monitoring and evaluation of the ICT based adult-literacy program should be the norm so that stalk of the achievement of goals is done on continuous basis.

11. The adult-literacy ICT Program implementers/Managers volunteers and facilitators should be provided pre-service/induction-level, in-service and refresher trainings to keep them abreast with the technological changes occurring from time to time.

12. Transparency and accountability of the Project implementers, Managers and even the Government should be made mandatory so that the clear picture should emerge as to how fairly, successfully and diligently are the ICTS being used in adult-literacy.

13. The problem of poor infrastructure is aggravated by lack of Government's foresight, concerted planning, programs and policies that include ICTs in Adult-literacy.

14. The government should not shy and enter into meaningful Private-Public partnerships with those private enterprises that have shown the will, have the spark to use ICTS in adult-literacy effectively.

15. The Indian Governments in power both at the centre as well as state level should have will and conviction to proactively use ICTS in adult-literacy.

Conclusions

Considering the large number of illiterates in our country, ICTS play an important role in adult literacy. These Pilot projects clearly indicate that ICTs cultivate an environment of learning, increase peoples' access to literacy and information, enhance learning capacities, create innovative local-content and lead to professional skill development of facilitators/ teachers. However ICTs can only address the problem of illiteracy when full-fledged meticulously planned projects with political will and commitment are implemented with full involvement of facilitators and stake-holders i,e. the adult learners.

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School Science Education and e-Learning in India: Status and Prospects

Jasim Ahmad

Associate Professor

Department of Teacher Training & Non Formal

Education, Faculty of Education,

Jamia Millia Islamia, New Delhi

Email: jahmad@jmi.ac.in

Abstract

School Science education is positively correlated with the understanding of its teachers and learners with regard to the nature and aspects of Science. Science teaching is more concerned with the inculcation of scientific attitude and Science process skills among its learners rather than transferring scientific facts and figures to the new generation. Whereas former may be considered as the root of Science education, the later is the shoot of it. Till the beginning of the 21st century, there has been pedagogical impediments with teaching-learning of Science at school levels where there was much stress on the later part of it and the former aspect was either missing or was given very less attention to. During the last decade, especially after the implementation of NCF 2005, RTE-2010 and CCE, much attention is being given to the construction of knowledge (constructivism) and holistic development of learners. In the process of transition from behaviourism to constructivism; from rote memorization based exams and evaluation system to Continuous and Comprehensive Evaluation (CCE), the scenario has changed. Now, especially in state run government schools, which covers the maximum school going children of the country, students are neither getting root of Science education nor enjoying its shoot system. They seem to be at the looser ends, as most of the Science classes are transacted using one-way approach of teaching, where Science teachers generally use chalk and talk method.This paper discusses the status of school Science education in Indian and its prospects in the context of e-learning.

Key words*: Science education, e-Content, digitization, NROER, e-Pathshala*

Introduction

Science is characterized as a body of knowledge obtained by scientists through various processes. It comprises of two important aspects – the products of Science and the processes of acquiring them which work as the backbone of further growth and development of the discipline. Science teaching and learning is assumed to be successful and effective if students develop mastery in both-the processes and the products of Science. According to Mukherjee (2007), "Science should emerge as something alive, fallible, and therefore exciting. Such a model will meet the wider aims of Science education, and at the same time is more likely to encourage students who want to study it".

School Science

Science is an integral component of school education and it is a core subject from class VI to class-X and taught as a part of environmental studies from class I to class V. The most important objective of Science teaching at school level is the development of scientific attitude in the learners and training them in scientific method, which prepares them to deal with the problems of daily life in a scientific way. Scientific attitude is a set of attitudes and values possessed by individuals, which make them objective, rational, logical and just in their actions and develop positive attitude towards life. UNESCO has mooted the goal of Science Education as the Scientific and Technological Literacy (STL) for the entire global citizen. Every citizen should be aware of the current trends in Science, cope with technology in everyday life, and should be able to take rational decisions on Science-related issues of social importance like conversion of agricultural lands into Specific Economic Zones, location for a nuclear power plant, development of smart cities, etc. School Science is required to be re-thought radically if STL for all is seen as the primary goal of Science education.

Current Status of School Science Education

Indian policy-making bodies have been expressing great concern for school Science education since independence. Efforts have been made to improve school education in general and Science education in particular. For this purpose several schemes have been launched time to

time and many provisions were made and implemented. But all goes in vain and we failed to improve the quality of Science education. One very good example is Hoshangabad Science Teaching Project (HSTP), a programme for teaching middle school Science through activities and experiments. This programme was started in 1972 as a pilot project in 16 schools situated in Hoshangabad district of Madhya Pradesh. In 2002, it was running in around 1000 schools, when it was abruptly closed due to some reasons. The HSTP was a unique project in a sense that it was a State programme which was running in ordinary Government schools and was supported by a large academic resource groups. It had great influence on the discourse on Science education in India.

NCERT, in its National Curriculum Framework document of 2005, addressed this issue afresh. New curriculum framework came into being which puts less emphasis on facts, tried to weaken disciplinary boundaries and linked school knowledge with outside knowledge. It was assumed that, if not the revolution, at least the condition of school Science education will improve. But eleven years after the implementation of NCF-2005, the situation remained the same. Science is still being taught as it was taught earlier.

In general, two approaches to teaching and learning of Science are applied at school level, namely the teacher-centered approach and the learner-centered approach. The methodology of teaching Science in schools should be such that learners can enjoy. Science is a subject which answers most of the learners' curiosity. Hence, the methodology of teaching Science should be chosen carefully so as to satisfy the curiosity of students on one hand and make them ask questions and find answers on their own, on the other hand.

Science Classes in Action

The data presented in table 1 is based on the random observation of 120 Science classes (elementary and secondary) in state government schools of Delhi (South, Central, and West), Bihar (Jahanabad, Madhubani, Supoul) and U.P. (Lucknow, Basti, Sultanpur).

Table 1Science classes in action (based on data gathered through observation schedule)

Teaching strategies being used	Lecture/ One-way/Chalk and Talk	Discussion/Question-Answer	Discussion & Demonstration	Use of AV Aids	Activity involving students	Use of ICT
Numbers	75 classes	40 classes	5 classes	00	00	00
Percent	62.50%	33.33%	4.16%	00	00	00

Empirical data (table 1) depicts the present scenario of Science teaching at elementary and secondary levels in state-run government schools in above listed three states. The empirical data is always more reliable than the data collected through other sources like questionnaire and interviews. As table 1 reflects, Science is mostly taught through chalk and talk method (62.5%), followed by discussion and question-answer method (33.33%); discussion and demonstration (4.16%). Science teaching should be conducted more by using activity, AV aids, demonstration and discussion; using constructivist approach. Hence there is a need to reverse the present pattern of Science teaching to make it more effective and joyful, unless a day may come when discussion and demonstration will again become an innovative method of Science teaching and unique for teachers as well as students.

ICT and e-Learning in Science

At present, Information and Communication Technology (ICT) has been given great emphasis in all walks of life including school Science education. Particularly, e-learning has gained great popularity now-a-days as potential platform for education. Government of India, through various agencies like NCERT, NIOS, IGNOU, IITs, etc. is engaged in developing e-learning resources for all levels of education, which are disseminated through National Repository of Education Resources (NROER), ePathshala and MOOCs on SWAYAM platform, etc.These e-learning resources should be made available to all school children at all India level. Teachers should be trained in how to access and use these resources for improving their teaching and students learning. Students should also be made aware of all these resources. These days children are techno savvy, they can make better use of these resources, provided that they have access to them.

E-Content is considered as any digitized material which can supplement students' learning and teachers' teaching-learning process. The availability and dissemination of e-Content is made sure by the

means of various Internet based platforms, telecast/broadcast, Mobile Applications, Repositories, Websites and through CDs and DVDs. Improvement in quality of the learning experiences of the stakeholders is the key element in e-Content development.

The following paragraphs showcase various important e-learning resources that can be used by teachers and students in the area of school Science education.

General Web2.0 tools for School Science Education

Wikis: Wikis are one of them which provide social and collaborative platforms to the users for quickly edit and create online content. They do not require special technological skills for users. They run through web browser in order to simplify collaborative content creation, maintenance, and publication in hypertext environments. Contribution of content and collaborative authoring is enabled by wikis. Other useful features in wikis include content navigation, versioning, and searching capabilities. Therefore, wikis may be used by Science teaching and learning at school level by the Science teachers as well as students who have access to the computer and internet. Many researchers have realized the potential of wikis for adding collaborative dimension in online and blended learning environments (Chiu, Wen, & Sheng, 2009; Coutinho & Bottentuit, 2007; Parker & Chao, 2007; Resta&Laferrière, 2007).

Blogs: The blog is a page on the internet where people can write about anything. Anyone can create his own blog; it may be made private or may be shared by some group of people having common interest. Science teachers can create a blog for his class which he or she is teaching. Anything can be written or added into the blog like commentary, reviews, comedy, news articles, Science related stories, history of the invention and discoveries of many things related to subject. Science teacher can give assignment to his class on the blog and students can do the assignment on the same and can give them feedback. This will save time, make Science teaching-learning interesting. Blogs work mainly as personal journal that are accessed online by the writer and anyone who reeds them from the site. One may add text, images, links of other websites, and other media on the blogs. The blogs can also be commented on by the readers and reflected on by the writer.

Podcasts: Podcasts are a type of digital media file. These are designed to educate, entertain, and inform something to others on the web through various syndication feeds. They then can be downloaded to computers or MP3 players and played anytime depending upon user's space and time. It can be used to disseminate scientific information in the form of content, audio files of experiments, scientific process, etc. Visit the websitewww.enpweb.org for further details. This site provides a list of educational podcasts to get an idea of what is available and how do they work.

Vodcasts: Like Podcasts, when a video film or clip is broadcast over the internet, it is given a specific name called as Vodcast. Hence it may be referred to as 'video podcast'. Video podcasts are also used for web television. This is commonly called as Web TV, which is a rapidly growing genre of digital entertainment that uses various forms of new media to deliver to an audience. Science teachers and students may develop video clips of scientific importance and may share among one another. This will make Science teaching and learning interesting.

E-mail groups: A list of e-mail addresses identified by a single name, such asjsssclassixscience@jmi.ac.in. This list contains all the e-mail ids of class IX students of Jamia Senior Secondary School. When an e-mail message is sent to the mailing list name, it is automatically forwarded to all the addresses in the list. The teacher and students may make the best use of this. Any one on the list can share valuable Science related information to others. Teacher may put some mind boggling question on this mailing list which may be a food for thought for all students. In this way it can be used as a strong tool for teaching and learning of Science.

NROER (National Repository of Open Educational Resources)

The National Repository of Open Educational Resources (NROER) is developed by Central Institute of Educational Technology (CIET) in collaboration with Ministry of Human Resources (MHRD), Government of India, to address the challenges faced by school education sector of our country. It provides a single window clearing house on all digital and digitisable resources on school education. It offers resources for all school subjects and grades in multiple Indian languages. It brings together all the digital resources for a school system such as educational videos, concept maps, audio clips, photographs, interactive objects, digital maps, diagrams, charts, images, educational articles, learning objects, talking books, textbook pages and

documents. For more information, visit nroer.gov.in. One can visit this site and filter the required information with regard to any school subject.

YouTube

It can be used for viewing, sharing and uploading audio/ video files. Science teachers can create videos of various activities, experiments and any interesting phenomenon that they observe and feel that it should be shared with the students. You can find a large number of videos related to scientific concepts and phenomena, activities and experiments which are available on the YouTube. Science teachers can use these in the classroom transaction for making the students inclined to observed these phenomena and learn by them. Students may be motivated to create and upload video files of any innovative experiment or project on the YouTube.

Virtual field trips

It is not possible to actually visit all the places relevant for Science teaching and learning due to economic reasons as well as time constraint. The alternative of this is a virtual field trip, which is a real time guided field trip supported by interactive pages on the web. If the live links with experts are available on the site, it gives real time virtual field trip involving the use of video-conferencing and audio-conferencing to permit students in one location to virtually visit and learn about other places, people and culture. To have an idea about

virtual field trips, you may visit
http://campus.fortunecity.com/newton/40/field.html.

E-Pathshala

The e-pathshala is a joint initiative of MHRD-GoI and NCERT for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials. The platform addresses the dual challenge of reaching out to a diverse clientèle and bridging the digital divide (geographical, socio-cultural and linguistic) offering comparable quality of e-contents and ensure its access free at anytime and anywhere. Students, teachers, educators and parents can access e-books through multiple technology platforms i.e. mobile phones, and tablets (as e-pub) and on web through laptops and desktops (as flip books). e-pathshala also allows its users to carry as many books as their device support. Features of these books allow users to select, read, zoom,

bookmark, highlight, navigate, share and make notes digitally. The App can be downloaded from respective stores (Android, iOS, Windows).

Conclusion

The status of Science teaching and learning in schools, especially government schools is miserable and requires proper monitoring, supervision and guidance. Science teachers need to be sensitized to their responsibilities and needed to make them accountable. Prof. D.S.Kothari had rightly said in his report on Science education that "learning Science is doing Science; there is no other way of learning Science". If Science education has to achieve its aims and objectives, it has to be strengthened and the process of strengthening should begin from teachers and educational administration to make them just, devoted, competent and overall a good social thinker and reformer. Using e-learning resources may prove to be of high importance as it gives opportunities for using these as platform for Science learning in virtual form. ICT adds immense value to teaching and learning, but it cannot replace a teacher. ICT can aid a teacher and can surely help make the teacher-student relationship more interactive. In the present era of continuously evolving technology, it is important that various ICT tools are absorbed into everyday teaching to make it more effective.

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Achievement Performance of Students through Computer Aided Learning Programme under SSA in selected Elementary Schools of Uttar Pradesh

M H Quasmi

Assitant Professor,
Department TT&NFE, IASE
Faculty of Education, Jamia Millia Islamia
Email: mhquasmi@gmail.com

Abstract

The present study tries to analyze the success of achievement level of Computer Aided Learning Programme under Sarva Shksha Abhiyan launched in 2002. The aim of the programme was to improve the IT literacy in the rural areas and remove the digital divide in the state by creating interest of students in school studies. The specific objective was to make the Students and Teachers familiar with Computer and to enable the government school student's especially in rural areas to be at par with the urban and advance school students. The study is carried out in 29 sampled schools of 5 districts in Uttar Pradesh namely, Ambedkarnagar, Bahraich, Balrampur, Hardoi and Sultanpur districts. The effort is made to assess the ICT facilities provided in each school, their optimal uses and ascertain whether an objective of the CAL programme is being achieved. Performance achievement of 110 students and their teachers of the concerned schools were measured in terms of application and skill development. The result shows encouraging and progressive development but due to many hindrances all schools have not performed equally well.

Key words*: CAI, ICT, Digital Divide, Multimedia, NKN*

Introduction

The ICT in education online service provides educationists with an informative knowledge base full of useful advice and resources relating to the use of technology across the curriculum. The study aims to search the classroom resources section to find material that can assist in the delivery of the topics or subjects, from interactive quizzes to lesson

plans there should be something for everyone. Learning achievement and creativity of the students are always bracketed with question mark in school curriculum. Especially in the field of Science, Math, Social sciences and languages where a lot of imaginative and creative skills are needed to conceptualize, the ICT method may prove to be better alternative for a better achievement. Sampath (1981) has stated, "The most exciting innovation in the educational technology is Computer-Assisted Instruction (CAI). Though it is still in the experimental stage, the day is not far off when it will revolutionize the whole process of Instruction. It is a fact that children learn a particular subject only because it is included in the syllabus. At the initial stage they do not have any kind of love and interest in studying a particular subject. To motivate them a teacher can create a good learning atmosphere in the classroom, he has to use a variety of teaching methods, techniques and different teaching aids. The role of teacher has changed from 'mere dispenser of knowledge' to that of an 'Information Manager'. Srinivasanhas rightly pointed out that *"Educators have to continue examining new communication and information technologies which can enhance and extend the instructional capacities of the teacher"*.

The Present Scenario

The present scenario of teaching is not very conducive to enhance learning processes; by observing classes of Science, Math and Social Sciences in most of the schools one can easily conclude that some of the objectives of the subject teaching are not fulfilled. Most of the students are not able to grasp the basic principles and cannot apply them in their daily life, because teachers make maximum use of lecture method while teaching. Students become passive listeners instead of active learners; often the doubts of the students remain unanswered. As a result many students develop an aversion to the subject. Today's teaching is topic oriented. Teachers are in a hurry to complete the content of the syllabus in limited time that too before examinations. So teachers usually have to stick to subject matter, to text book content, no extra information is provided to the students. Observing today's classrooms it is also a fact that these classrooms are not homogenous but they are heterogeneous. Students are from different socio-economic background, having difference in level of Intelligence, ability to learn and perform creativity. In short there are individual differences among learners and the teacher must take into consideration these individual differences while teaching a subject. The lesson planning should be

based on the new sophisticated technique i.e. ICT and use of CAI which is the most useful thing for the teachers and interesting for students also. The teachers and students look at the present curriculum as examination oriented. Student's interest is to secure marks in the examination than to understand the subject matter in depth. Wherever the students teacher ratio is more than 40, there is least interactions between teacher and students. In such circumstances, computer technology can serve as the key vehicle for stimulating learning as computers have several features that can help to reduce the shortcomings of regular teaching and make teaching more interesting and effective.

Importance of CAI

Computer assisted instruction (CAI) dates back to the early 1960's. With the introduction of micro-computers in 1980's a new enthusiasm was generated to use it for instructional purposes. The first major pioneering attempt in CAI was made in the U.S.A. in 1961. The second land mark in CAI was in the year 1966 when computerized tutorials in arithmetic and reading for elementary school children were developed by Patrick Suppes of Stanford University. Tondon (1966) applied a computer to teach fifth graders, the elements of binary system, computer vocabulary and the know-how of computer operations. Now the Micro Computers are being used on a regular basis widely at all levels of education from primary to University. As a result, Computer Assisted Instruction (CAI) has become an Integral part of the learning process in the advanced and developed countries of the world.

Sample and method

29 elementary schools selected for study from 5 districts of Uttar Pradesh were given computer along with generator and internet facilities. Observation and questionnaires were used to ascertain the facilities and assess the performance level of students in classes VI, VII and VIII. The questionnaire contained 38 indicators relating to computer infrastructures and content materials. The performance was assessed on the basis of score as good, satisfactory and poor categories. The district wise analysis and findings are given below:

1. Ambedkar Nagar

Computer Aided Learning (CAL) programme in 6 sampled schools as UPS Umrapur and UPS Shukul Bazar in Baskhari block, UPS Songaon and UPS Kalyanpur in Jalalpur block, UPS Chachikpur of Bheeti block

and UPS Harsingpur in Bhion block where CAL programme was going on. All computers were in available in 6 (100%) schools. Computers were available in computer room in 3 (50%) school and in class room in 3 (50%) school Printers were available in 4 (66.67%) schools. UPS were available in 6 (100%) schools. LCD projector was not available in 2 (33.33%) schools. Computer chairs and Computer tables were available in 3 (50%) schools. Generator and computer cum projector trollies were not available in any school. Out of 33 computer in 6 schools only 17 (51.51) Computers were functioning and16 Computers were out of order due to one or the other defects. The internet facility was provided to all but functional in only 3 (50%) school. The teachers used their own data card in 1 (16.16%) school in absence of internet.

Topic wise list of digital material was available in only 1 (16.16%) school. Topic wise list of multimedia was available in 1 (16.16%) school. Science, Math, Social Science, Hindi, Urdu and English multimedia TLM was available in only 1 (16.16%) school for classes VI to VIII. Out of 6 sampled schools no teachers has received CAL training and 3 teachers know content of digital learning, 3 teachers were seen using CD and 1 teachers was seen applying ICT skills.

Performance Achievement

26 students of all the six schools worked on computer out of which 8 (30.76%) were good in operation. They were able search topical material on Google through internet and through CD besides, fundamental operation of opening, closing, creating files and working in MS Words, Excl and paints. 12 (46.15%) students performed satisfactorily but they were not able to search materials while 8 (30.76%) students performance was poor as they were not able to create a file or write a sentence in MS words.

2. Bahraich

Computer aided learning programme was observed in 8 (20%) sampled schools i.e. UPSs in Nawabganj, Kesarganj, Chintora, Mahsi, Rijiya, Jakhal, Tajwapur block and Shivpur blocks where CAL programme was going on.

Computers were available in 4 (50%) schools. Computers were available in computer room in 3 (37.5%) schools and in class room in 4 (50%) schools. Printers were available in 6 (75%) schools. UPS were available in 6 (75%) schools. LCD projector was not available in 2 (25%) schools. Computer chairs were available in 2 (25%) schools and

Computer tables were available in 3 (37.5%) schools. Generator was available in 3 (37.5%) schools. Computer cum projector trolley was not available in any school. Out of 32 computers in 8 schools, only 23 (71.87) were functioning. The internet facility was provided to all but functional in only 2 (37.5%) school. The teachers used their own data card in 2 (37.5%) school in absence of internet.

Topic wise list of digital material was available in only 1 (12.5%) school. Topic wise list of multimedia was available in 1 (12.5%) school. Science, Math, social science, Hindi, Urdu and English multimedia TLM was available for classes VI-VIII in 1 (12.5%) schools. Of 8 sampled schools, no teachers has received CAL training, 7 teachers knew content of digital learning, 3 teachers were seen using CD and 9 teachers were applying ICT skills.

Performance Achievement

Around 30 students of all the 8 schools performed on computer out of which 6 (20%) were good in operation. They were able to search topic related material on Google through internet and through CD besides, fundamental operation of opening, closing, creating files and working in MS Words, Excl and paints. 14 (46.66%) students performed satisfactorily but they were not able to search materials while 10 (33.33%) students performance was poor not able create a file or write a sentence in MS words.

3. Balrampur

Computer aided learning programme was observed in 2 (5%) sampled schools. These are UPSs Balrampur and Tulsipur blocks.

Computers were not available in any school. Computers were available in computer room in 1 (50%) school and in class room in 1 (50%) school. Printers were available in only 1 (50%) schools. UPS were available in 1 (50%) schools. LCD projector was not available in any school. Computer chairs were available in 1 (50%) schools and Computer tables were not available in any school. Generator and Computer cum projector trolley were not available in any school. Out of 3 computers in 2 schools all 3 (100%) Computers were functioning. The internet facility was provided to all and functional in both schools.

Topic wise list of digital material was not available in any school. Topic wise list of multimedia was also not available in any school. Subject wise multimedia TLM were not available in any school for classes VI to VIII. Of 2 sampled schools, no teachers received CAL

training and no teacher was seen using CD or digital material in any of these 2 schools.

Performance Achievement

Only 6 students of the 2 schools performed on computer out of which 2 (33.33%) were good in operation. They were able to search topic related material on Google through internet and through CD besides, fundamental operation of opening, closing, creating files and working in MS Words, Excl and paints. 3 (50%) students performed satisfactorily but they were not able to search materials while 1 (16.66%) student's performance was poor who was not able to create a file or write a sentence in MS words.

4. Hardoi

Computer aided learning programme was observed in 7 (17.5%) sampled schools. These are GUPS Hariyawa in Hariyawa block, JHS Kachauna in Kachauna block, UPS Haibatpur in Bilgram block, UPS Sikandarpur Kallu in Shahabad block, UPS Beniganj in Kothawan block and UPS Satar in Todarpur block, where CAL programme was going on.

Computers were available in 6 (85.7%) schools. Computers were available in computer room in 3 (42.9%) schools and in class rooms in 4 (57.1%) schools. Printer was available in 1 (14.3%) school only. UPS were available in 5 (71.4%) schools. LCD projector was available in 4 (57.1%) schools. Computer chairs were available in 4 (57.1%) schools and Computer tables were available in 3 (42.9%) schools. Generator was available in 1 (14.3%) schools. Computer cum projector trolley was not available in any school. In 7 schools, all computers were functioning in 2 (28.6%) schools. Out of 25 computers in 7 schools only 20 (80%) Computers were functioning. The internet facility was provided to all but functional in 4 (57.1%) school. The teachers used their own data card in 2 (28.6%) school in absence of internet.

Topic wise list of digital material was available in only 2 (28.6%) school. Topic wise list of multimedia was available in 2 (28.6%) school. Science, Math Hindi and Enlish multimedia TLM was available for classes VI-VIII in 2 (28.6%) schools. Urdu multimedia TLM was available in 1 (14.3%) school for classes VI to VIII. Out of 7 sampled schools teachers of 2 (28.6%) schools have received CAL training and 6 teachers knew content of digital learning, 6 teachers were seen using CD and 5 teachers were applying ICT skills.

Performance Achievement

28 students of all the seven schools performed on computer out of which 12 (42.85%) were good in operation. They were able to search topic related material on Google through internet and through CD besides, fundamental operation of opening, closing, creating files and working in MS Words, Excl and paints. 10 (35.71%) students performed satisfactorily but they were not able to search materials while 6 (21.42%) students performance was poor and they were not able to create a file or write a sentence in MS words.

5. Sultanpur

Computer aided learning programme was observed in 6 sampled schools. UPSs Sarangpur,Tehansa, Kurebhar, Chhetra, Jaisinghpur and Bhadeya blocks.

Computers were available in 4 (66.7%) schools. Computers were available in computer room in 3 (50%) school and in class room in 4 (66.7%) school. Printers were available in 1 (16.7%) schools and not available in 5 (83.3%) school. UPS were available in 5 (83.3%) schools. LCD projector was available in 1 (16.7%) schools. Computer chairs were available in 3 (50%) schools and Computer tables were available in 3 (50%) schools. Generator was not available in any school. Computer cum projector trolley was also not available in any school. Out of 6 schools, all computers were functioning in 2 (33.3%) schools. Out of 20 computers in 6 schools only 12 (60%) Computers were functioning. 8 Computers were not functioning. The internet facility was provided to all but functional in only 3 (50%) school. The teachers used their own data card in 1 (16.7%) school in absence of internet.

Topic wise list of digital material was available in only 2 (33.3%) school. Topic wise list of multimedia was available in 1 (16.7%) school. Science, Math, Social Science and English multimedia TLM was available for classes VI-VIII in 2 (33.3%) schools. Urdu multimedia TLM was available in 1 (16.7%) school for classes VI to VIII.

Out of 6 in the sampled schools 4 teachers received CAL training and 4 teachers knew content of digital learning, 4 teachers were seen using CD and 4 teachers were applying ICT skills.

Performance Achievement

20 students of all the six schools performed on computer out of which 5 (25%) were good in operation. They were able to search topic related material on Google through internet and through CD besides, fundamental operation of opening, closing, creating files and working in MS Words, Excl and paints. 9 (45%) students performed satisfactorily but they were not able to search materials while 6 (30%) students performance was poor they were not able to create a file or write a sentence in MS words.

Statistical analysis of Students' performance

A performance analysis of 110 students of all districts and their respective activities are shown below in table No. 1 to 3.

Class		opening/ closing	Computer Function	MS word
VI –VIII	N	110	110	110
	Mean	1.00	.77	1.00
	Std. Deviation	.000	.430	.000

Table 1: Mean performance in operating computer

Class		cut/paste	Ms Excl	MS paint	internet surfing	e-mail
VI-VIII	N	110	110	110	110	110
	Mean	.63	.83	.87	.71	.68
	Std. Deviation	.490	.379	.346	.431	.442

Table 2: Mean performance in other activities

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
cut/paste	9.258	109	.000	.646	.51	.79
Ms Excl	15.330	109	.000	.833	.72	.94

MS paint	18.138	109	.000	.875	.78	.97
MS Word	12.573	109	.000	.771	.65	.89
internet surfing	14.271	109	.000	.813	.70	.93
e-mail	6.856	109	.000	.500	.35	.65

Table 3 One sample t-test

The tables itself is self explanatory of students' performance and significant at 95% level of confidence. It means if all students are provided CAL, their performance will be high.

Problems faced by schools, Teachers and Students

1. Computers were provided from the period 2002 to 2005 by some private companies and now their contract is over. Hence, problem of repair and maintenance of computers remains at prime level.
2. There is no separate fund for computer maintenance.
3. Most of the schools do not have CD or content materials.
4. Electricity failure is a major problem in conducting CAL classes.
5. Generators are old age always showing one or the other defects.
6. In some schools computers are locked.
7. Students do not find space in computer room. It is not possible to hold a class in computer rooms.
8. Teachers have not been trained in CAI in most schools. The old trained teachers have been transferred to other schools.
9. Teaching – learning materials for subjects in the form of CDs are not available in most of the schools.
10. Internet connections are fussy; do not get connected at class time.

Conclusion

From the above discussion it is clear that the infrastructure provided for CAL programme at the beginning was thought to be sufficient but with the passage of time no renovation has taken place. The result can be seen from the performance achievement of the students which is high in the category of satisfactory and poor. The achievement in good category ranges from 42.85% in Hardoi to 30.76% in Ambedkarnagar. It shows that students can do better both in understanding subject concept and application of technology with appropriate help and guidance by the teachers. The objective of CAL programme can fully

be attained when above mentioned problems are addressed in the effective manner. There is enthusiasm for CAL both among students and teachers. The result shows encouraging; however, due to many hindrances all schools have not performed equally well.

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Teachers' Attitude towards E-Learning

Vijayshri Bhati,

Associate Professor,

RDKM, Noida

Email: vijayshri.bhati@gmail.com

Abstract

"Instruction ends in school room, but lifelong learning continues throughout life". In recent years, there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. Now E-learning plays a significant role in the education sector. This article tries to find out as to what extent teacher, attitude towards E-learning helps in improving the quality of education.

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Introduction

ICT has emerged as a tool for extending educational opportunities both formal and non-formal. Web based instruction greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems. Online learning and virtual learning enables the new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from a teacher centered pedagogy – in its worst form characterized by memorization and rote learning – to one that is learner – centered E-learning supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning. In the 21st Century, a teacher is not the only source of knowledge or information because of globalization. The advances in technology are changing the whole nature and philosophy of education and by this it is forcing us to get reformed thoroughly. With the emergence of World Wide Web (WWW), the world of teaching and learning has adopted it as one of its main innovations. However, in spite of extensive use of the web in education, a variety of terminologies are used to depict this new field of knowledge. Most of

the advanced countries have already adapted these kinds of learning methods. Some of the terms mostly used interchangeably such as: Web-based instruction, Virtual learning, E-learning and online learning.

Keywords

Web-based instruction – It is a 'hypermedia based instructional program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported".

Virtual learning – The educational process of learning over the Internet without having face-to-face contact is known as virtual learning.

E-learning – "The term e-learning covers a wide set of applications and processes including computer – based learning, web-based learning, virtual classroom and digital collaboration".

Online learning – It is synonymous with web-based learning where learning is fostered via the WWW only, in an Internet or intranet.

Need and Significance

Introduction of computer education in schools is a major step in the direction of ICT in preparing the next generation workers. ICT is the most significant challenge now confronting teachers, schools and teacher education. A teacher being a pivot in the process of teaching and learning, knowledge of ICT and skills to use ICT in teaching learning has gained immense importance for today's Teacher Education Institutions (TEIs).

In the new technology era the role of classroom teaching is directed toward technology linked instruction. For the effective use of www the teachers should have positive attitude towards the technology and be aware of information overload in the Internet. This study analyzes the attitude of high school teachers and higher secondary school teachers towards E-learning at school level.

Statement of the Problem

"Teachers attitude towards E-learning".

Objectives of the Study

- To study the significant difference in the attitude of male and female teachers towards E-learning.

- To study the significant difference in the attitude of aided and government schoolteachers onwards E-learning.
- To study the significant difference in the attitude of aided and unaided schoolteachers towards E-learning
- To study the significant difference in the attitude of unaided and government schoolteachers towards E-learning.
- To study the significant difference in the attitude of unaided and government schoolteachers towards E-learning.
- To study the significant difference in the attitude of teachers having an experience of five years and above five years towards E-learning.
- To study the significant difference in the attitude of teachers handling high school and higher secondary classes towards E-learning.
- **Hypotheses**
- There is no significant difference in the attitude of male and female teachers towards E-learning.
- There is no significant difference in the attitude of aided and government schoolteachers towards E-learning.
- There is no significant difference in the attitude of aided and unaided schoolteachers towards E-learning.
- There is no significant difference in the attitude of government and unaided schoolteachers towards E-learning.
- There is no significant difference in the attitude of Arts Subject and Science subject qualified teachers towards E-learning.
- There is no significant difference in the attitude of teachers having an experience of five years and above five years towards E-learning.
- There is no significant difference in the attitude of teachers handling high school and higher secondary classes towards E-learning.

Sample

A sample of 100 secondary and higher secondary school teachers constituted the sample for the present study.

Methodology

In order to realize the above said objectives, Normative Survey Method was employed.

Tools Used

The investigator used an attitude scale as a research tool. The questionnaire consisted of 33 statements. Each item provided three responses. The responses were expressed on a three point scale, agree, undecided, disagree and weights of 3, 2, 1 were given in that order for the favorable statements and the unfavorable statements.

Statistical Techniques Used

For the analysis of data, the researcher has used simple statistical technique such as Mean, Standard Deviation and t-test.

Analysis and Interpretation

Table-1: Showing the Significant Difference between Male and Female Teachers towards E-learning

Gender	N	Mean	S.D.	t-value	Remark
Male	40	72.88	9.82	0.35	Not significant
Female	60	73.57	9.82		

Table 1 shows that the calculated 't' value 0.35 is less than the table value 1.96 at 0.05 level. So the null hypothesis is accepted. Hence there is no significant difference in the attitude of male and female teachers towards E-learning.

Table-2: Showing the Significant Difference between Government and Aided School teachers towards E-learning

Types of Management	N	Mean	S.D.	t-value	Remark
Govt.	26	74.62	11	2.34	Significant
Aided	38	68.79	7.7		

Table 2 shows that the calculated 't' value 2.34 is greater than the table value 1.96 at 005 levels. So the null hypothesis is rejected. Hence there is significant difference in the attitude Government and Aided schoolteachers towards E-learning.

Table-3:Showing the Significant Difference between the Aided and Unaided School teachers regarding E-learning

Types of Management	N	Mean	S.D.	t-value	Remark
Aided	38	68.79	7.7	4.21	Significant
Unaided	36	77.08	9.12		

Table 3 shows that the calculated 't' value 4.21 is greater than the table value 1.96 at 0.05 levels. So the null hypothesis is rejected. Hence there is significant difference in the attitude of Aided and Unaided schoolteachers towards E-learning.

Table-4: Showing the Significant Difference between Government and Unaided Schoolteachers towards E-learning.

Types of Management	N	Mean	S.D.	t-value	Remark
Aided	26	74.62	11	0.93	Not Significant
Unaided	36	77.08	9.12		

Table 4 shows that the calculated 't' value 0.93 is less than the table value 1.96 at 005 levels. So the null hypothesis is accepted. Hence there is no significant difference in the attitude of Govt. and Unaided School teachers towards E-learning.

Table-5:   Showing the Significant Difference between High School and Higher Secondary School teachers towards E-learning

Types of Management	N	Mean	S.D.	t-value	Remark
High School	38	74.47	9.78	0.95	Not Significant
Higher Sec.	62	72.56	9.79		

Table 5 shows that the calculated t value 0.95 is less than the table value 1.96 at 0.05 level. So the null hypothesis is accepted. Hence there is no significant difference among the high school and higher secondary schoolteachers towards E-learning.

Table-6: Showing the Attitude of Arts Subject and Science Subject Qualified Teachers towards E-learning

Subject	N	Mean	S.D.	t-value	Remark
Arts	57	74.61	9.8	1.58	Not Significant
Science	43	71.53	9.57		

Table 6 shows that the calculated 't' value 1.58 is less than the table value 1.96 at 0.05 level. So the null hypothesis is accepted. Hence there is no significant difference among the Arts subject and Science subject qualified teachers towards E-learning.

Table-7: **Showing the Significant Difference between the Teachers having an Experience of Below Five Years and More than**

Five Years towards E-learning

Experience	N	Mean	S.D.	t-value	Remark
Below 5 Yrs	52	73.94	9.63	0.69	Not Significant
More than 5 Yrs	48	72.58	9.99		

Table 7 shows that the calculated 't' value 0.69 is less than the table value 1.96 at 0.05 level. So the null hypothesis is accepted. Hence there is no significant difference between the teachers having an experience of below five years and more than five years towards E-learning.

Findings of the Study

E-learning is a modern trend in the field of education. It provides as much information and knowledge based upon the teachers ability and students strength. E-learning is a new pedagogical outlook in the mental map of a classroom teacher. The E-learning resources provide all kinds of knowledge to the classroom teaching for the effective use of E-learning inside the classroom the role of the teacher is of vital importance.

The present study reveals that both male and female teachers have a positive attitude towards E-learning. This may be due to the large awareness of modern technologies and Internet usage of teachers in educational system. This finding is similar to that of the study made by Maya George (2006) who found that both male and female teachers have favorable attitude towards learning through computer. But this study is contrary to that of the study done by Rajasekhar S (2003) who observed that male B Ed students show more favorable attitude than their counterparts.

The government and unaided schoolteachers have more favorable attitude than aided schoolteachers. The government schoolteachers utilize the training programs related to IT orientation and update their knowledge in the field of ICT. Unaided schools have better technological equipments to attract students towards their school. So

the teachers working in unaided schools are acquainted with modern technologies for effective teaching.

By E-learning the teachers can continuously seek new ways to capture the attention of students and create active learning environment, where minds are engaged and interest nurtured. Hence the teachers having below five years of experience and above five years of experience do not vary significantly in their attitude towards E-learning,

Educational Implications of the Study

Since technology had crept into our classrooms many years ago in the form of using improvised teaching aids with further advancement in technology and advent of e-learning, so it is implied that the boundaries of our classrooms have to be dissolved and the teacher and the students have to become more and more techno savvy. The teachers will have to deliver content via all electronic media, including the intranets, extranets, satellite broadcasts, videos, interactive TV and CD-ROM. The future classrooms will be more and more virtual as online learning is fast replacing face to face on campus learning. E-learning suits to the somato-sensory needs of human brain, keeping the learner attentive by significantly enhancing perception, increasing level of participation and interaction, helping to stop, reflect, repeat and integrate the learning, thereby speeding up learning and enhancing retention.

Conclusion

The E-learning method will definitely help teachers in harnessing technology to make teaching – learning program more effective and meaningful. A more aware teacher can move a step further to remove the repercussions of e-learning by blending it with traditional teaching optimally especially for Indian Classroom.

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Pre-service Science Teachers' use of Information and Communication Tools in Science Classrooms: Issues and Prospects

Garima Bansal

Assistant Professor

Lady Irwin College, University of Delhi

Emil: Garima1agg@gmail.com

Abstract

This study examines the perceptions of pre-service teachers in using ICT resources in science classrooms. Contextual factors existent in an ICT-rich school environment are identified that may facilitate or impede the usage of ICT resources and its' relation to teachers' pedagogical planning is examined using qualitative research methods. It emerged that technical, managerial and language issues offered barriers to successful integration of available ICT tools in science teaching-learning. Implications from the study argue for the development of teachers' technological pedagogical content knowledge and provision of support by school to facilitate the easy usage of ICT rich resources in science classrooms.

Keywords: *science, ICT, pre-service teachers. Perceptions, factors*

Introduction

Information Communication and Technology (ICT)-rich environment may act as a catalyst for change in pedagogy (Hawkridge,1990). Research reports a considerable use of ICT in science learning and teaching; for example, Bell and Bell (2003) produced a bibliography of over 50 articles between 1994 and 2003 relating to ICT use in K-12 science teaching. Types of ICT tools useful for science teaching-learning include using World Wide Web as an information source, emails for communication, simulations, modeling software, data logging, multimedia –editing software etc. (Cox & Webb, 2004).

ICT tools have been used to arrive at conceptual change in sciences, for example, use of simulations to promote students' understanding of physical phenomena involving interacting variables (Hinton 1978, White lock et al., 1991); using combination of physical and virtual

modeling to support the development of conceptual understanding of organic compounds (Dori & Barak, 2001).

The Cognitive Acceleration in Science Education (CASE) methodology (Adey, 1999) employs a series of carefully structured problem-solving tasks, supported by guidance from teacher or a more able peer, to provide a general stimulation to the students' cognitive processing mechanism. Huppert et al. (1998) suggested that computer-based simulations enable learners to investigate three independent variables in an experiment, justify hypothesis, and apply ideas form one simulation to another population.

Research into pedagogical innovations associated with formative assessment lays an impetus on teachers designing questions that could evoke discussion involving many students in the class (Black et al., 2002). In Computer as Learning Partner (CLP) project (Linn & His, 2000), the ICT-rich environment performed the function of keeping track of learners' progress and provided necessary scaffolding, thus, enabling teachers to focus on the development of questions that could evoke classroom interactions. ICT-rich environment manages students' assessment data using data logging software which helps teachers to derive meaningful inferences about students' progress.

It can be suggested that ICT-rich environment benefits science learning by promoting cognitive development by providing wider range of experiences so that students can relate science to their daily lives, increases meta cognitive skills among students and supports data collection and presentation (Webb, 2005). She further observed "the crucial component in the use of ICT in learning and teaching is the teacher and their pedagogical approaches" (p. 705) as a strong relationship between the ways of using ICT by the teachers and student outcomes has been identified.

Keeping this into consideration, the study aims to examine pre-service teachers' experiential zone, perceptions, and hence their evolution in usage of affordances provided by ICT-rich school environment.

Research Questions

Following research questions guided the study:

1. What are the perceptions of pre-service science teachers about the use of ICT?
2. What contextual factors impact the usage of available ICT resources for science teaching-learning?

3. How do these contextual factors relate to pre-service teachers' pedagogical planning in science classrooms?

Method

Research Design

This study is located in qualitative research traditions (Holliday, 2007). This research paradigm seems to be best suited to the study as an in-depth exploration of issues was sought after.

Context and Participants

A cohort of six pre-service science teachers, enrolled in Bachelor of Education (B.Ed) program of University of Delhi, India was chosen for this study. B.Ed. is a two year teacher education program. Along with other theory papers, students study Pedagogy of Science and usage of Information-Communication Technology in the first year of B.Ed. program. It is followed by six month school internship in the second year of the program. This is a qualifying degree program to become a school teacher as per National Council of Teacher Education norms in the country.

The cohort of teachers chosen for the study were placed in a private co-educational school located in the urban locale of the city for their internship which is called as School Experience Program. They were teaching middle grades science. This study took place in the academic session of 2016-17 by the author herself who was positioned as a regular school supervisor in the school. All the participants had a Bachelors degree in Home Sciences. All the participants were female.

School had high quality infrastructure and offered ICT-rich environment. It had smart boards installed in all its classrooms. All the smart boards had pre-installed simulations relating to the scientific content of different grades. Ports for usage of pen-drive, speakers and other necessary hardware were available. Also, smart boards had internet access.

Data Collection

-   Following tools were used for collecting data for the study:
-   Semi-structured interviews with pre-service teachers on their perceptions of use of ICT in science, challenges in its' use and benefits to students' science learning (total of 6 hours- one hour with each teacher) ;

- Field notes gathered from classroom observations (total of 12 hours- 2 hours in each teacher's classroom)
- Anecdotal records of pre-service teachers.
- Pseudonyms are used for the names of the participants to maintain confidentiality and anonymity.

Data Analysis

This paper adopts thematic analysis (Cohen, Manion, & Morriosn, 2011) as an approach for identifying categories under which the discussion is made in the next section.

Findings

Data collected from the study indicated that all the participants believed in the benefits of ICT for teaching-learning. Their lesson plan diaries demonstrated a continuous effort in integrating ICT resources in their pedagogical planning. However, it was identified that several context-embedded issues impeded the full utilization of affordances that were being offered by ICT-rich school environment which are discussed in detail underneath.

Technical Skills

Teachers in the study observed faced problems in usage of smart-boards and other technological innovations in their classrooms due to inadequate knowledge and skills. When questioned about their coursework regarding ICT usage in the first year of B.Ed. program, it was observed

It was more of theory….We had only two sessions on using smart boards……and that too were demonstrations……I mean, I have never held stylus in my own hand before coming to the school….(Rakhi)

This view suggests that coursework in pre-service teacher training requires rigorous practical work and hands-on experimentation.

Managerial issue

Pre-service teachers who persisted in using the available technology, owing to school administration's requirements, faced technical hitches. These issues ranged from slow internet connections, cursor taking time to respond; pen drives not being supported due to virus, faulty error messages disturbing writing on smart board etc. All the more positioning of smart boards offered some hurdles in their usage as it was observed that at times due to sun glare things written on board were not visible to a section of the classroom. These issues created

classroom management issues eventually discouraging pre-service teachers from using ICT resources available to them.

Teachers observed that classroom teaching is a spontaneous process and time spent in responding to these issues lead to loss of class control with students' attention getting digressed on to off-task issues.

What happened that day….when I had to teach the topic Adaption in animals, for this topic, I wanted to show some images of different animals to students …but suddenly (emphasis in tone) I came to know that their smart board key has been lost ….. I was not able to use smart board at that time (Nima).

My sixth grade science class was on the chapter structure and function of living organisms, I was teaching plants' root system. For this topic, I wanted to show the images of tap root and fibrous root ….. I wanted to start my class with the pictures of both type of root systems but the smart board didn't work. It started refreshing the window …. I mean, I was confused as in I had planned that way……..But, I took courage and responded by drawing the pictures of these roots on the black board. Though the pictures were not as clear as it could have been on the smart board yet the session continued……... (Gritha)

Both these teachers planned to use ICT resources at specific points of time in their pedagogical approaches. Problems emerging at those particular points lead them to re-plan spontaneously which was challenging for pre-service teachers.

Language barriers

Teachers observed that large amount of resources were available to them but it took time and preparation to sift and select the appropriate material for the lesson. Also, language in which the ICT resource was being played was of critical importance. This is so as resources having "foreign accent were hardly understandable" (Shivani) by the students. They make fun of the resource as it could not engage them appropriately.

Conclusion and Implications

Through this study, it was observed that pre-service teachers require mentoring in pursuing amidst of challenges offered by technical glitches and its' impact on their pedagogical planning. Schools can also provide adequate support by providing quick solutions to the technical issues arising in the system which could smoothen the process of

utilizing ICT resources. Further, it seems crucial that teachers require time to sift and select appropriate resources for their subjects and group of students.

However, even providing all the resources will not suffice unless and until teachers have advanced Technological Pedagogical Content Knowledge TPCK). The onus of its' development goes on to the teacher education programs who apart from providing theoretical knowledge should provide pre-service teachers with lots of practical skills in using ICT resources in classrooms.

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Use of Blended Learning in Pre Service Teacher Education

Shalini Yadava

Assistant Professor
School of Education, GGSIP University, New Delhi
Email: shaliniy21@yahoo.com

Abstract

This paper explores the use of blended learning in the pre service teacher education programme. It explains how different types of technologies may be integrated in the traditional classroom discourse effectively. The paper further gives specific examples how technology inputs can be used in different course components of the B.Ed. programme such as the School Experience Programme, Foundation Papers, Pedagogical Subjects strengthening the case for Blended learning

Keyword*s*: *Blended Learning, B.Ed. Programme ,e learning*

Introduction

All around the world in the field of teacher education academicians and administrators are found to be repeatedly debating on the ways and means to create a teaching -learning environment which ensures satisfactory learner achievement. The creation of an enriched teaching learning environment depends largely on the efficiency and effectiveness of the teacher in command of the class. Now the crucial question is how do we ensure that the teacher is competent enough to do so? The answer appears to be the obvious i.e to equip the future teachers with the necessary knowledge, skills and attitudes in the Pre Service Teacher Education programme itself .One such critical domain in which we need to make the student-teachers proficient is the Use of ICT. One common dilemma trainers encounter in teaching teachers is the fear that ICT shall replace them in the classrooms which is totally unfounded.ICT can never be a substitute for face to face mode of classroom teaching but it can complement and supplement the efforts of the teacher by being used as an aid .With the privatization of education taking shape in the form of mushrooming of the global schools or world schools there is stiff competition in the market .The

teachers have no option but to embrace ICT with a positive attitude and make optimal use of it in teaching-learning processes in the classroom and beyond .For this it is imperative that the pre-service teacher education programmes itself embrace ICT use on a day to day basis for enriching the classroom discourse. The best approach which may be adopted is to use Blended Learning to transact the curriculum of the service teacher education programme such as the B.Ed. course which has a huge number of stakeholders. Let us first therefore begin with understanding the essence of Blended learning.

The Concept of Blending Learning: The term Blended Learning as the name suggests is the use of different types of learning approaches using a variety of delivery mechanisms. The point is why did we need blended learning? It was found that using only the e learning mode especially in the case of distance education programmes did not prove to be fruitful as often the students felt the need to interact with their mentors ,teachers or teacher educators in a face to face mode too. On one hand we have e learning which does provide the platform wherein a large number of multimedia resources such as audio clips, videos ,PowerPoint presentations, films etc are available at the click of the mouse and on the other hand we have a traditional classroom setting which is predominated by lectures and textbooks .All we need to do is integrate the two effectively such that the experience which the learners are provided is more interesting, engaging, challenging and joyful. Blended Learning offers a variety of choices to the educators by the use of e learning in asynchronous and synchronous learning environments apart from the classroom.

Let us understand through specific examples the application and use of Blended learning in the Pre Service Teacher Education Curriculum at B.Ed. level.

Examples of the Use of Blended learning in the B.Ed. Curriculum

a)School Experience Programme (SEP): The most crucial aspect for a B.Ed. curriculum to be successfully implemented is the rich field experiences the student-teacher participates in during what is commonly known as the Practice Teaching Component. Now that the B.Ed. course is a course of two years duration and the student-teacher is required to be placed in the school for a period of 16 weeks, the need for mentorship is even higher .It is a common practice that every week the student-teachers meet their faculty mentors once or twice to get their lesson plans approved and seek guidance with reference to the

problems they face in the field .However many of them struggle on account of no interaction with faculty mentors on a day to day basis given the fact that all the schools in which the student-teachers are placed for the SEP are not in close vicinity of their respective colleges or universities. In order to support these struggling future teachers ,apart from the face to face discussion possible once a week we must encourage faculty mentors to find time each day to engage in live chats with the students at a fixed time ,answer their queries on email and brainstorm with them on online forums such as the discussion boards. This shall go a long way in boosting the morale of these budding teachers who are often lost due to a wide gap between what they learn in theory and what is expected of them in schools .Another change is many of the reports which they are required to submit such as the Case Study must be submitted as e portfolios including the submission of a multimedia lesson plan which hone the skills of the student teachers in integrating ICT in their teaching –learning endeavors.

b)Teaching of Foundation Papers : Whether it is the teaching of Philosophical Foundation of Education, Sociological Perspective on Education, Psychology of Teaching and Learning, Curriculum Studies, Assessment of Learning etc the most popular method employed in the classroom discourse is the lecture method .One way of improving the Philosophical discourse on Education would be to ask the students to view the online videos on the famous world philosophers such as the famous speech of Swami Vivekananda in the World Religion Congress in Chicago, Paulo Freire's Ideas on the banking type of Education, Henry Giroux on Critical Pedagogy ,Sri Aurobindo's thought on Integral Education or Dr Zakir Hussain's ideas on Basic Education. The students may be asked to browse through these videos on one hand and this must be supplemented with reflecting on original writings of Philosophers on Education on the other hand. This must be followed by a face to face discussion in the classroom on the ideas assimilated by the students in the process culling out the contemporary relevance of the thoughts of these great thinkers. This exercise shall enable the development of critical thinking in the students by the churning of diverse ideas during discussions.

In the teaching of Sociology and Psychology of Education apart from the classroom lectures we may provide online self study modules for the students to move at their own pace .The teacher educator may ask students to watch online presentations on the works of famous

sociologists and psychologists such as Jean Paul Piaget, Bandura, Margaret Mead, Ausubel, August Comte etc .They should also be shown films such as Water ,I am Kalam, Matrubhumi etc to be sensitized to the diverse issues in the Indian Society .Films may be used as a powerful media to introduce them to the concept of multiculturalism too. In Curriculum studies students may be asked to compare and contrast the curricula of different schools across the world giving them an understanding as to what kind of learning experiences are common across the board and how they differ .For the paper on Assessment of Learning students must be made to learn the skill of construction of online tests and online evaluation formats.

c) Teaching the Pedagogies of Different Subjects: In order to facilitate the student-teachers in mastering the techniques of different teaching methods apart from demonstrating the same the student-teachers must be shown videos of each teaching skill to understand the fine nuances involved. The performance of the student-teachers while they are engaged in simulated teaching must be recorded over a period of time to gauge the improvement .The language students must be introduced to the use of online language games ,quizzes ,interactive exercises to improve vocabulary and pronunciation. Another use of technology enabled teaching is in the language laboratories wherein students through the use of language DVDs be taught the nuances of the spoken language. This shall enable student-teachers to increase their proficiency in terms of pronunciation; vocabulary and understanding the correct syntactical structures of sentences .For this we need to procure and access the vast repertoire of online resources available through our language laboratories.

Conclusion

Blended learning no doubt has the potential to offer a us a plethora of opportunities such that students not only learn but learn meaningfully such that learning is transferred from one context to another .We have the internet technology, the mobile technology and the wireless technology which have made access to resources very easy.

However a major problem is that the teachers and teacher educators are still not ready to come out of their comfort zones of traditional methods of teaching. There is hardly any evidence which suggests that teachers are ready to explore different technologies to enhance student achievement. For Blended learning to be successful we need to equip our teachers and teacher educators with the use of graphics, animation,

videos, blogs, online assessment, discussion boards, social networking sites etc in order to optimize their teaching. Once this is done Blended learning shall emerge as an option in a big way.

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Social Networking in Teacher Education

Bharti Sharma[1]&Alka Singh[2]

[1]Assistant Professor & [2]Research Associate

[1]IASE, Faculty of Education, Jamia Millia Islamia, Delhi

[2]Commonwealth Education Media Centre for Asia, Delhi

Email: drbhartisharma261@gmail.com & edu.alkasingh@gmail.com

Abstract

India has become a global country for the internet generation with increasing number of internet user is marked out to strengthen various fields including economy, health, social welfare and education as well. Hence, education cannot be far away from internet's responsive nature, whether it be benefits or challenges. Social networking sites (SNSs) are an important part of the internet which allows the user to collaborate and communicate with the world around through various features of these sites. Thus, we need to search out the scope of using these social networking sites in teacher education as the teachers are the rope and hope of the internet generation, they should use it with superlative experiences. But there are many challenges also to look for. The present study aimed to understand the perception and experiences of integrating social networking sites in teacher education as per the explicit experiences of teacher educators cum educational technology experts. An interview schedule was developed for collecting data from 15 teacher educator cum educational technology experts from India and abroad. Data analysis was done by using data analysis software Dedoose. Findings of the study indicated that teacher educators cum educational technology experts have positive perception towards using SNSs in pre-service teacher education. They also indicated some challenges to be kept in mind for integrating these sites in teacher education.

Keywords: *Social Networking Sites (SNSs), Technology, Qualitative study*

Introduction

Internet penetration in India is so huge that it is showing the high growth rate of users of social networking sites day by day. In the

Global ICT Index which measures the level of ICT access, India has been ranked a low 131 out of 167 nations. The report further shows that the accessibility of internet and computer has been increased in households in our country over the last five years. Hence, India is focusing on to become internet friendly and provide services through e-platforms for widening access and availability.

Most of the research on social networking sites and education revealed that there is a massive list of positive upshots but some other research have also discussed the unwilling factors about using these sites. Some of the positive factors include the enhancement of teaching and learning experiences by networking and social communication capabilities which can benefit both the instructor and the student by tapping into a greater number of learning styles, providing an alternative to the traditional lecture format, creating an online classroom community, and increasing teacher-student and student-student interaction (Ryan, Magro & Sharp, 2011; Munoz & Towner, 2009; Mazer et al., 2007). Recent studies proclaimed 'that social networking was helpful for communication, information gathering', and curriculum-based interactions among students (Kitsantas, Dabbagh, Chirinos & Fake, 2016; Hamid, Waycott, Kurnia, & Chang, (2015) and educational activities are valuable for developing students' collaborative skills through social networking (Tay & Allen, 2011). Hamid et. al. (2015) in their study showed the other aspect of better engagement between course content and students who use these sites, and, it revealed the development of the higher level of understanding and mastery of the topics and foster student–content interactions. Although there are many positive outcomes through using social networking sites for educational purposes, some other research also exposed the challenges of using them. A recent study by Manca & Ranieri (2016) presented the challenges and explained that that Social Media use is still rather limited and restricted and that academics are not much inclined to integrate these devices into their practices for several reasons, such as cultural resistance, pedagogical issues or institutional constraints. On the same line, the actual use by faculty was set out to be at a minimal level (Sobaih, Moustafa, Ghandforoush, & Khan, 2016; Roblyer et.al. 2010). In addition, Ryan, Magro & Sharp (2011) argue that social networking facilitates educational activities and knowledge exchange, helps in alleviating apprehension and enabling socialization for building community.

To strengthen the power of social networking sites, we need to incorporate it in education and should make effort to harness its value and despite its potential, there are very few research available especially in Indian context while India is the biggest space for social networking users, So it's essential to understand the way experts of educational technology who are also practicing the task of preparation of teachers think about these sites in educational context and to review their experiences about using these networking sites for educational purposes. It is the need of time to explore the potential of social networking sites in teacher education whether that may be positive or negative, millions of Indians are on their Smartphone and other devices with 24x7 access.

The aim of the present study was to understand the perception and experiences of teacher educator cum educational technology experts towards integrating social networking sites in teacher education further to assess the need for integrating these sites in teacher education.

Methodology

To study the experts' experiences and perception, a semi-structured interview schedule was developed by the researcher on the basis of review of related literature. Further, the experts of research and educational technology were consulted for validation of the tool. The experts have given their in-depth contribution to best suit the tool for the predefined objectives. Thus, the 20 to 30 minutes duration semi-structured interview schedule with different dimensions was finalized. For collecting data, almost 80 requests were made through social networking sites, mail and in person, among them 15 were voluntarily accepted the request for being interviewed. The sample was selected on the voluntary basis from the experts having experience (teacher education & educational technology) of minimum ten years. Thus, 15 teacher educators cum educational technology experts were interviewed on voluntary basis.

For qualitative data, the *thematic content analysis* process was used to analyze the transcripts. For interpretation of the transcripts, themes were identified and collected together under themes and sub-themes. "Regardless of whether data are analysed by hand or using computer software, the process of thematic content analysis involves identifying themes and categories that 'emerge from the data' which involves discovering themes in the interview transcripts and attempting to verify, confirm and qualify them by searching through the data and

repeating the process to identify further themes and categories" (Burnard, Gill, Stewart, Treasure & Chadwick, 2008). However, qualitative data analysis software, dedoose, has been used to analyse the transcripts. Dedoose is an online platform especially for qualitative data with 'powerful, feature-rich, collaborative, inexpensive web-based applications for researchers of all sorts' (http://www.dedoose.com).

Findings& Discussion

As the data was collected through the semi – structured interview schedule, the in-depth understanding is the purpose of the study. Thus, the comprehensive qualitative data was inserted in Dedoose software to make themes and further develop the coding system around those themes. Thus, the whole thematic content analysis was placed around five themes, and coding system was developed to interpret the findings of the study. The major themes generated by the analysis of the transcripts are discussed below:

Use and Experiences of SNSs in Teaching Learning Process

Most of the responses by experts regarding their experiences of using SNSs in teaching learning process were mixed with positive as well as negative practices. Additionally, they were also concerned about some issues which they experienced while implementing social networking approach to their traditional teaching.

The major barrier as experienced by the experts was the gap between have or have not or the digital divide. With this, infrastructural barrier was the major concern of experts. On the other hand, they have also shown concern about lack of institutional support and its rigidity in using these sites for educational purposes. Sometimes, these sites create distraction with the traditional teaching and learning process. Thus, digital divide, institutional and infrastructural were the most responded negative experiences by experts. An expert stated:

"...we are very advanced, but there is digital division of society which hinder the use of social media with students who come from various socio-economic background"

However, experts were highly positive as these sites decrease the gap between teachers and students and create a friendly learning environment. It helps to boost students to interact and engage with other students with flexible time. They highlighted that facebook, twitter, slidesshare, edmodo, YouTube and other sites are convenient

and easy to use to interact with students and get famous globally by sharing on social networking platform. They expressed:

"Incorporating use of social networking sites in teaching learning process helps students understand the concept better, use their own knowledge of technology in the learning process, increases students' participation, helps provide more resources, facilitates and eases out the content explanation, enhances learning…"

"Students are excited and love to work together using social media sites, it also offers them more flexibility as it may not be practically possible to work and meet physically…"

Advantages of integrating Social Networking Sites in Teacher Education

Majority of experts indicated that there are many advantages of integrating different social networking sites in teacher education. They mentioned some the preferred sites such as Facebook, blog, slide share, edmodo, twitter, Google+, YouTube, LinkedIn and classroom 2.0. As one of the expert said:

"…there are plenty of sites which we use to engage with our students. Most of them use Facebook in their daily routine, even they forget everything, they don't forget to post their status on facebook…"

Hence, most of the interviewer agreed that Facebook is the highly used and popular networking site among others, although they also pointed out the major challengers of using facebook in teaching & learning process. One expert reflected:

"…facebook is one medium where I stay in touch with my students, it gives me more comfort to know them at a human level and interact with them as a friend and not just in an official capacity…"

The experts considered social networking as a platform to connect with the global knowledge and to get the guidance from best experts in the field so personalized learning is emphasized to ensure the better teaching and learning experiences. Moreover, the others inclined their position towards ease of access with anytime anywhere availability through cost-effective infrastructure. Another advantage was to provide a platform for self-expression and reflective critical thinking which emerged by posting the stakeholders views on any of such site. Students used to like and comment on the posts which further upgrade the profession development of prospective teachers and the teacher

educators as well. In addition, social networking also facilitates synchronous and asynchronous communication to share knowledge among students or on a global platform.

Some of the experts specifically described the use of these sites when the face-to-face class was not in regular mode, as when the pre-service teachers go for practice teaching. The teachers can share their experiences and challenges in dealing with school students and with that peer-to-peer interaction, they can get immediate solutions and appreciation. They make more friends to undertake the problems in academics and career as well.

Potential of Social Networking Sites in forthcoming years

The experts discussed about the potential of social networking sites which revealed from some direct and indirect questions of the interview schedule. Most of them recognized that these sites will give a new and innovative learning environment not the separate phenomena from the traditional classroom, but to supplement our present education system. Some emphasized that teachers will be more frank with their students which will eventually change the whole traditional teaching learning scenario and replace it with a more supportive and flexible learning environment. The digital divide will be weakened with the promising approach of government and organizational support which will assure 24X7 access of internet. It will be more convenient for the students to connect with teachers or other experts for a real time solution of any academic problem. In spite of the above potentials, employment opportunities, smart learning, popularity, critical thinking and global citizenship are other possible aspects which will develop in coming years to strengthen the teaching-learning process. On the other hand, some experts expressed their concerns of extreme use of these sites which is elaborated in challenges. One of the expert explained:

"the future looks very positive. In the coming years, I foresee technology and social networking sites in education as evolving, state of the art, need of the hour- totally inclusive, a part of the curriculum, with hands on approach mandatory for all age groups."

Strategies for Successful Integration of Social Networking sites in Teacher Education

Underlining their experiences, the experts were asked to express the progressive strategies for integrating social networking sites in teacher education successfully. They emphasized that teachers role should be

changed to construct a student-centered and student friendly environment where students and teachers should feel free to interact with each other. Even, this will open the door for global connections to enhance the overall experiences of teaching & learning.

The most important strategy should be to prepare the teachers and students for the upcoming era of internet generation. So, some training and workshops should be organized to train the stakeholders and make them aware of the major issues such as cyber bullying, privacy and digital awareness. Thus the strategy should be integrated and context oriented to fulfill the potential of these sites. Some experts say:

"...By making them a part of habit, and teaching students the aspects of digital safety and plagiarism. Making them aware of digital avatars, security, etiquettes, duties and digital rights and responsibilities…"

"Provide authentic classroom scenarios to facilitate implementation of innovative pedagogical strategies, assign several field based projects that include usage of social media provide in depth knowledge of online tools available, provide opportunities to share best practices with peers, recognize the various sources at hand…"

Challenges of Integrating SNSs in teacher education

In addition, it is also important to understand the challenges of using social networking sites by the students and teachers. According to the majority of the experts, the main challenges of using social networking in education is its restriction in their colleges or institutions and they do not get proper responses for their educational updates.

On the other hand, cyber bullying issue was also expressed as important challenge; others are the infrastructural challenges and lack of feedback control. Thus, experts are very positive to use social networking sites as an encouraging platform with highlighting the challenges at the same time.

Conclusion

The whole story rotated around the five themes uncovered about the experts' perspective on social networking facilitation in teacher education. The experts are well experienced of using social networking with the concerning issues of incorporating it with their students. Along with positive aspects, they discussed about the age old mindset of teachers who are still living in 20th century classrooms. They need to think beyond and teach the way students need to be taught in the

21stcentury. We cannot step back in this digitized era; it is the need of time to accelerate the speed of acknowledging innovative technologies with supportive strategies to cope up with new undefined academic and psychological challenges.

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Awareness and Usage of E-Resources in Research and Academic Activities: A Study of MANUU Students

Indrajeet Dutta & Neeti Dutta

Assistant Professors

Maulana Azad National Urdu University,

College of Teacher Education, Bhopal

Email: indraneet@gmail.com

Abstract

E-resources are a vital aspect of knowledge building in the contemporary society. Many organizations are working over it to build a gamut of e-resources which will help both our learners and our workers. Government and international organizations are also spending millions of dollars to design, develop by and disseminate quality e-learning material which could be accessed by openly and freely to people anytime and anywhere. The present research is a small study conducted on post graduate students of MANUU to find out awareness and usage of e-resources for academic and research activities. Twenty nine students participated in the research. The result showed that students had awareness about e-resources but its usage is still limited to few databases e-resources. Wikipedia is the most popular e-resources for students.

Introduction

Khan Academy, Udacity, EduX, MIT courseware are some of the best known sources of e-resources which are now extensively being used globally both at school and higher education levels. Khan Academy started its journey in 2006 to provide free world class education to anyone and anywhere by developing e-resources in almost all the school subjects using audio, video and animations and thus helping millions of children to get access to quality educational resource material for school education. Similarly, MIT free and open courseware started in 2001 to offer educational materials on web based platforms for engineering undergraduate and postgraduate students for different courses is one of the most sought after e-resources available in higher education. These educational materials have actually changed the

paradigm of educational resources from printed to web based resources. Similarly Udacity and EduX are also such giants in the field of e-resources that they offer online courses not only in computer sciences but in other fields of engineering. The question arises what prompted them to offer such courses or subjects online or develop materials and make them available online? The answer would be the benefits that are associated with e-resources. One of the biggest benefits is that it is available and accessible to people anytime and everywhere. Moreover, it is cost effective, easy to store, interactive, easy to retrieve and transit and has durability. That's why almost every government and educational institution after realizing the potential of e-resources has started designing and developing e-resources for its learners. Many of the bigger universities and organizations are now making their educational material available in the digital format on their web platform. The best part of e-resources is that it is not only available in textual form but also being supported by audio, video and animated form.

As a result it is easier to comprehend than the printed textual material. These e-resources have enhanced the knowledge domain of the learners. Indian institutions and government realizing the potential have started several initiatives to develop e-resources databases. These include e-sakshat, national repository of educational resources, vidaynidhi, shodhganga, national science digital library, pg-pathshala, consortium of educational content etc covering almost all the disciplines. It is available on the different web platforms developed and maintained by various governmental educational agencies. With these e-resources, learners can have access to these educational materials free of cost. Realizing its usefulness, teacher and students community are making good use of it for teaching, research and other academic activities.

Justification of Research: E-resources are designed and developed by the educational institutions with the objective of providing quality educational material to teachers and learners for enhancing their level of knowledge and use it effectively in their academic and research endeavour. Moreover, in India many of educational institutions are deprived of quality teachers. So, e-resources would be a help to those learners to get access to get at least quality educational material that too free of cost at any point of time and anywhere. Moreover, sometimes teachers found it difficult to make students understand some concepts.

In such cases, these e-resources come as a help to these teachers to explain more effectively their students. The biggest challenge in contemporary world is the amount of knowledge being generated and made available to learners without checking its originality, usability, along with its reliability and validity. So, it is important that dissemination of knowledge should be done in a systematic and organized manner so that learners get right set of knowledge which will help them in immediate and future world of work. Hence, it is necessary learners should be aware of various governmental and non-governmental agencies developing e-resources for the authentic material. Present research was carried out by the investigators to find out the awareness about e-resources and their databases (Indian) and their usage for their academic and research endeavour.

Objectives of the Study: The main objectives of the study were:

i) To find out the level of awareness among pupil teachers towards e-resources and their databases.

ii) To find out extent of usage of e-resources in their academic and research activities.

Methodology:

Sample: Students pursuing their post graduate degree in education and were in third semester were selected as sample for the research. The reason behind selecting the third semester students were as they had studied emerging technologies(ICT) in the second semester where they got exposed to sources of various types of databases and they were presently using it for the research and academic activities. Of the 44 students, only 29 students were willing to participate in the research. Since the sample was very small, any generalization from the study would not be feasible.

Research Design: It was descriptive research wherein researchers intended to find out the level of awareness and usage of e-resources in their academic and research endeavour.

Tool Used: The researchers reviewed the existing studies done on e-resources and thus constructed a structured questionnaire comprising three sections: (1) demographic information; (2) awareness about e-resources (3) knowledge and use of electronic resources; Questions related to awareness was on e-resources and their databases whereas for usage questions related to type of e-resources used and their frequency of usage in academic and research activities were constructed.

Results and Analysis:

1. **Demographic Details of Students:** The sample of 29 students consisted of 86.20% male and 14.80% female students. It was found that 75.86% of students belonged to the families with an annual income of less than a lakh each whereas 24.14% of the students belonged to the family with an income ranging between 1 lakh to 2.5 lakhs. It means that most of the students belonged to economically weaker sections of the society as per the norms of the government of India. As far as category of the students is concerned 55.17% belonged to the general category whereas rest 44.83% belonged to the Other Backward Class (OBC). In regard to the age of the students, 62.05% were in the age group of 21-25 years and 37.96% students were in the age group of 26-30 years.

2. **Awareness about E-resources:** All the sample students were aware about e-resources, but when asked about the concept of e-resources only 62.06% of sampled students gave the correct responses that e-resources are available on both offline and online mode and 37.93% of the sampled students reported that e-resources are available only on online mode. This indicates that large percentage of students were not only aware of the e-resources but also knew about the concept of e-resources.

(i) Another question asked was related to the awareness about different sources of database of e-resources, it was found that all the sampled students considered search engine, e-newspaper and email were database of e-resources. Out of the total sample, 96.55% students considered that e-books, websites, e-learning courses, e-research reports were sources of database of e-resources. Around 89.65% of the total students considered e-thesis and e-magazines were sources of databases. More than 80% students considered e-journals, e-libraries, and bibliographic database were sources of e-resources. E-manuscripts and e-data archives are only two e-resources where almost 50% of students considered it as database of e-resources whereas almost 51.73% and 48.28% were unaware that these two were database of e-resource. Hence, from the result it was clear that a high percentage of students (more than 80%) considered 13 out of 15 sources as database of e-resources.

Table No.1: Students Response on Items Related to Awareness

| S.No	Item	Yes	No
1	Awareness about E-resources	100%	0
Awareness about databases of e-Resources		**Yes**	**No**
1	e-books	96.55%	3.45%
2	e-journals	86.20%	13.80%
3	e-manuscripts	48.27%	51.73%
4	e-Data archives	51.72%	48.28%
5	e-magazines	89.65%	10.35%
6	e-thesis	89.65%	10.35%
7	e-learning (courses)	96.55%	3.45%
8	e-dictionaries	93.10%	6.90%
9	Websites	96.55%	3.45%
10	search engines	100%	0
11	e-libraries	82.75%	18.25%
12	e-newspaper	100%	0
13	e-mail	100%	0
14	e-research reports	96.55%	3.45%
`15	Bibliographic database	82.75%	18.25%
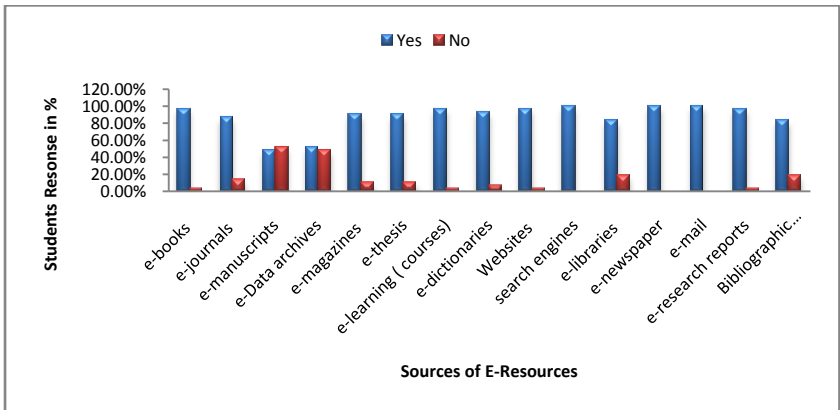
Graph No. 1: Bars Showing Awareness of Students about E-Resources

3. **Usage of E-resources:** In regard to question related to ease of access of e-resources, it was found that 41.37% students reported that they accessed e-resources very easily, 51.72% reported that they did it easily wheras only 6.89% reported that they found it diificult to access the e-resources.

Table No. 2: **Response of Students on Ease of Access of E-Resources**

| Item	Very Easily	Easily	Difficulty	With Great Difficulty
Ease of access to e-resources from data bases	41.37%	51.72%	6.89%	0.0%
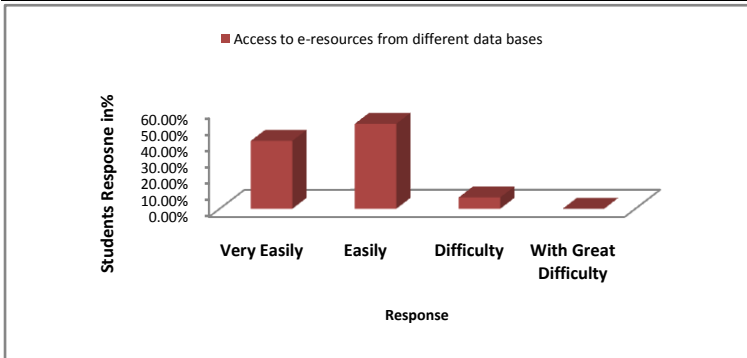
Graph No. 2: Bars Representing Ease of Access to E-Resources

(ii) In regard to the question on length of time using e-resources, 34.48% students reported that they had been using it for more than four years, 27.58% for last two-four years and 17.24% reported they had been using it for less than 1 year but more than six months . Only 3.44% students reported that they had been using e-resources for last six months or less.

Table No. 3: **Students Response on Length of Time of Using E-Resources**

| S.No	Item	< 6 months	6 mths.-1 Yr.	1-2 Yrs.	2-4 Yrs.	> 4 Yrs.
1	Length of using E-Resources	3.44%	17.24%	17.24%	27.58%	34.48%
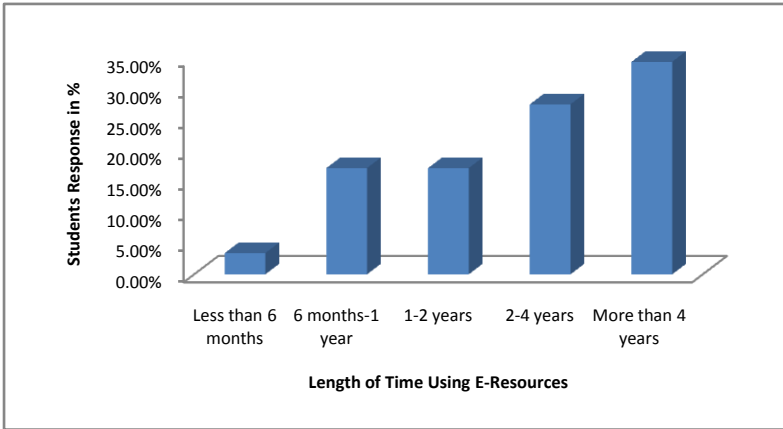
Graph No. 3: Bars Showing Lenghth of Time Using E-Resources

(iii) On the questions related to the usage of e-resources for academic and research activities, 51.72% i.e. more than half of the sampled students reported that they sometimes used e-resources for academic and research activities, 41.37% rarely used it for academic and research and only 6.89% used it often in the academic and research activities. Surprisingly, the post graduate students did not use e-resources regularly for their research and academic activities which means potential sources of getting e-resources were unknown to them.

Table No. 3:   Students Response on Length of Time of Using E-Resources

| Item	Rarely	Sometimes	Often	Regularly
Use e-resources for your Research & Academic activities	41.37%	51.72%	6.89%	0.0%
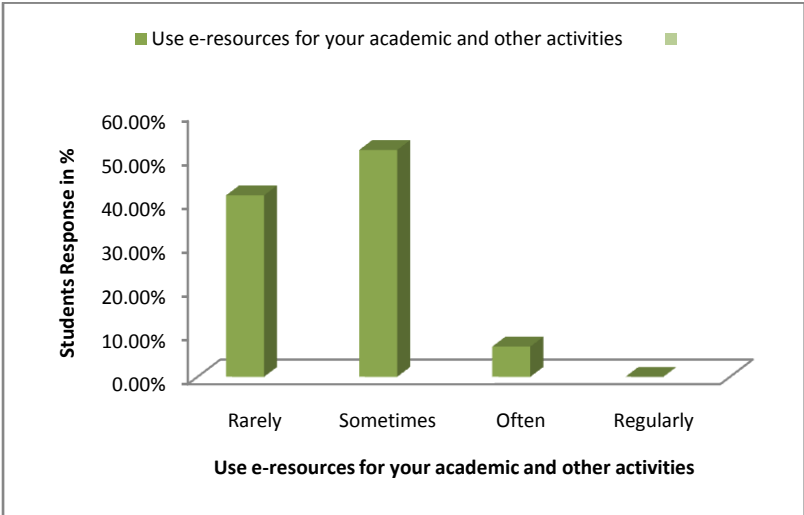
Graph No. 4: Bars Showing Use of E-Resources Research & Academic Activities

(iv) Regarding the number of hours spent per week to find and use e-resources, it has been reported that almost 31.03 % students invested 2-5 hours per week, 17.24% each students invested either 7-9 hours or greater twenty hours per week for usage of e-resources. 10.34% students each invests either 1 hour per week or 10-20 hours per week for the usage of e-resources.

Table No. 4: Students Response on No. of Hours/Week on Internet Using E-Resources

| Item	<1 hr/ Wk	2-5 hrs/ Wk	5-7hrs/ Wk	7-9 hrs /Wk	10-20 hrs /Wk	> 20 hrs /Wk
No. of Hours Spend/ Week To Use E-Resources	10.34%	31.03%	13.7%	17.24%	10.34%	17.24%
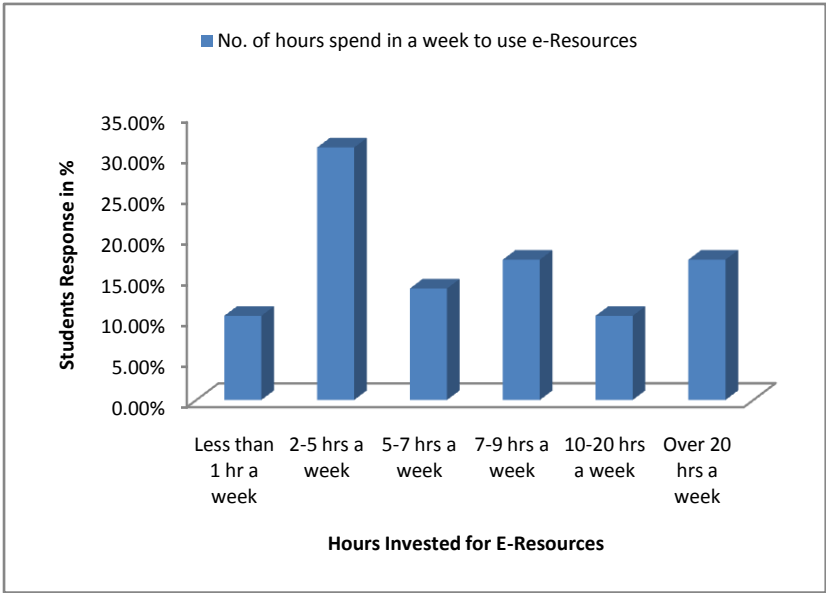
Graph No. 5: Bars Showing No. of Hours/Week Invested to Use E-Resources

(v)   While asking question on getting information about sources or databases of e-resources, 65.51% students reported that they browse search engines to access the databases of e-resources while 34.48% students reported that they type web address to get the databases of e-resources and only 6.89% students reported that they had subscribed e-resources for their academic and research activities.

Table No. 4: Students Response on Browsing on Internet for E-Resources

| Item	Accessing Web Address of e-resources	Search Engines	Subscribed e-Resources
Browsing the required information from the e-Resources	34.48%	65.51%	6.89%
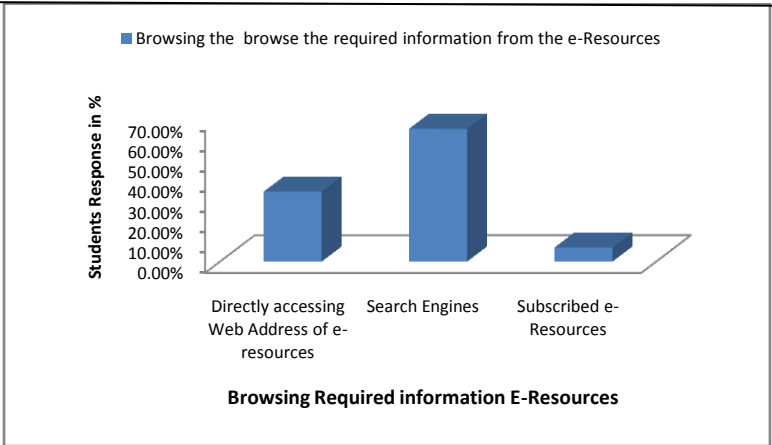
Graph No. 5: Bars Showing Browsing on the Internet for E-resources

(vi). The last question related to usage of database of e-resources from the given list of sources. For this question mean score was calculated. The average mean score for each of the e-resources is 2.5 and any score less than that indicates low usage whereas any score higher than 2.5 indicates high usage. It has been reported that Wikipedia is the only e-resource which had a mean score of 3.06 higher than the average score which indicate that Wikipedia is extensively used as e-resource by the students for research and academic activities. The next source which is being used by the students was shodhganga-a site for e-thesis which was having a mean score of almost 2.5. Almost eleven e-resources were there whose mean score obtained lies in between 1-2 which indicates that student seldom used these e-resources for their academic or research activities. Also it was found that eight e-resources whose mean score lies in between 0-1, which means they were rarely being used by the students. It is wonder to note that e-resources whose score lies between 0-1 are the ones which are very directly connected to education discipline.

Table No. 5: Students Response on Usage of Databases for E-Resources

Sources of Databases of E-Resources	Mean Score
PG pathshala	0.7586
Shodhganga	2.4827
DOAJ	1.62061

Shodh Sindhu(N List)	1.1379
e-gyankosh	0.862
e-Sakshat	0.8275
UGC-INFLIBNET	1.4827
UGC Infonet	1.5172
ERIC	0.5517
NROER	0.3448
UG Pathshala	0.7931
ERNET	0.7931
CEC	1.3103
Future Learn	1.2068
Vidyanidhi	0.931
NSDL	1.0689
NKRC	1.0344
NISCAIR	0.2758
Wikipedia	3.0689
Creative Commons	1.3103
OPAC	1.3448
DELNET	1.3793
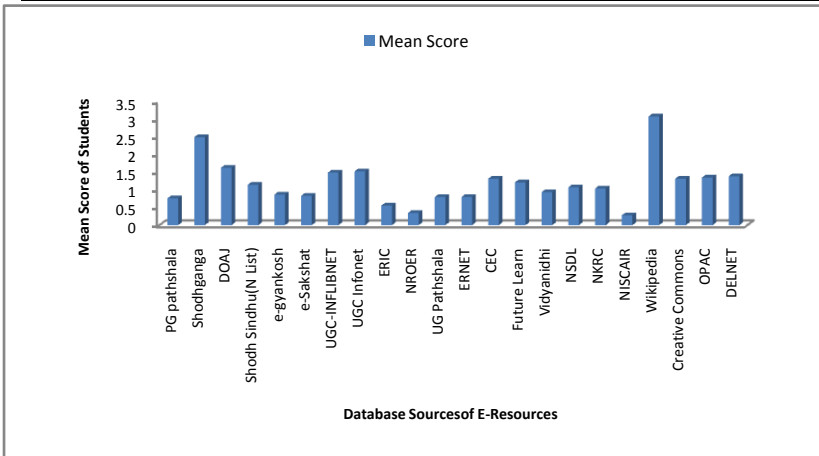
Graph No. 6: Bars Showing Usage of Databases for E-resources

It had been infered from the study that students have good level of awareness about e-resources anmd they spend good amount of time on internet world but but they were not well acquianted about the various sources of e-resources and their databses.

Conclusion

E-resources have been a boon to present generation teachers and students who can utilize the existing databases of e-resources and enhance their knowledge in their own disciplines as well as across discipline. The present research, though small in nature revealed that though students were aware of the e-resources and their concept, they were not very much aqcauanited with its usage it in their own academic and research life. The resaon may stem out that the students of MANUU were not well acquainted with different databses of e-resources available on the internet world. Hence, it is nercessary to utilize these e-resources to the full. It is also imperative that students should be oriented through programmes and workshop which will help them to a great extent for future academic endeavour.

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A Study of Factors Associated with Utilization of Open Course Ware as perceived by Students of Higher Learning Institutions

Narayan Patidar[1] & Akhilesh Kumar Singh[2]

Lecturer [1] & Director[2]

Educational Multimedia Research Centre, DAVV, Indore

Email: narayanpatidar@gmail.com

Abstract

With open course ware (OCW), anyone can access any course at any place in any language via internet. It may become a powerful tool to support e-learning as well as traditional classroom based learning. OCW was started by MIT as open educational resources. OCW is now expanded to many countries of world like China, Japan, Indonesia and India as well. Countries run open course ware either by translating MIT's course ware to their languages or by producing their own. NPTEL started it in India in engineering, science and humanities streams. MHRD also started production and distribution of open course wares in India under National Mission on Education through ICT (NME-ICT) which can be accessed through Sakshat portal. The major objective of this study is to assess the factors associated with utilization of OCW as perceived by the students. Keeping in mind this objective, the investigator decided to survey students of higher learning institutions.

The present study was survey in nature. The sample of the study comprised 418 undergraduate and postgraduate students belonging to urban, semi-urban and rural areas. This study identified three factors namely user-flexibility, choice-based access and content delivery associated with the utilization of the OCW.

Background of the study

Every nation has various types of educational system for their students from classroom based learning to open and distance learning. Classroom learning has their benefits over learning but competition is increased day-by-day and students want to gain more and more knowledge. But there are so many barriers like communication, finance

etc. which pool back them from various source of learning. Open course ware could solve these problems because it is free and open to all; anyone can access any type of course available at any time. So it will be a tool which gives access to knowledge. People are accessing internet for informational and educational content which has increased rapidly. Open courseware websites provide educational contents based on syllabus and it is already run in India and some countries in collaboration of OCW Consortium and MIT Open Course Ware. Open Course Ware is a type of e-learning model which is delivered via internet and run by the universities or institutions. Open Course Ware provide education free of cost to all learners. There is no fee for any type of course. It does not provide any degree or certificate but provides self-learning course material to learners. Open Course Ware or OCW is a term applied to course materials created by the universities and shared freely with the world using internet.

According to OCW consortium "An Open Course Ware (OCW) is a free and open digital publication of high quality university evel educational materials. These materials are organized as courses, and often include course planning materials and evaluation tools as well as thematic content. Open CourseWare is free and openly licensed, accessible to anyone, anytime via the internet". Open CourseWare started at MIT (Massachusetts Institute of Technology) with the launch of MIT Open Course Ware website in October 2002. MIT published many of its university courses on OCW website. The MIT OCW has currently published 2260 courses on its website.

After MIT many universities of various countries launched OCW websites and published their courses on these websites for their students. Currently, more than 250 other universities and associated organizations around the world have joined MIT, and have been publishing their course materials freely and openly for more than 13,000 courses in 20 languages (Avineni and Pusapati, 2012). Open course ware initiatives in India are multidisciplinary in nature. They provide various kinds of documents useful for education. Some open course ware initiatives like NPTEL and UNESCO-SALIS are subject

specific (Bherwani, 2012). NPTEL is India's first attempt to create open course ware and open educational resources for the benefit of undergraduate students in engineering and technology disciplines in engineering, science and humanities streams (Das, 2014). This is an Open Course ware initiative by seven Indian Institute of Technology (IIT) and the Indian Institute of Science (IISc). It is funded by the Ministry of Human Resource Development (MHRD), Government of India (Majumder and Sharma, 2010). Currently NPTEL has produced more than 860 courses. According to the highlights given on NPTEL's website more than 860 courses are available on Feb. 2015 and its website recorded more than 200 Million page views.

Another open course wares are eGyankosh from Indira Gandhi National Open University (IGNOU), Consortium for Educational Communication popularly known as CEC, NCERT online textbooks, e-PG Pathshala and Sakshat web portal. Students and self-learners access these contents to gain knowledge, preparing their presentations and assignments. Faculties and working professionals also access it as an addition. It can be accessed any time anywhere without any barrier. OCW provides students an open space to learn without any traditional classroom environment. It supports and enhances teaching – learning process of self-learners those who want to get more and more knowledge. Anyone can learn any subject without any barrier. The objective of open course ware website is to provide free access to course material without any fee and it does not guaranty any course degree. Regular degree course has their importance and cannot be replaced by OCW. It provides supports to these degree courses.

Rationale of the Study

In future with open courseware the globalization of education will occur. "21st century is a century of Global Competition also in Higher Education" Makoshi (2006). Anyone can access any course in any language via internet through open courseware. In future it will be work as a powerful tool to support education not to replace classroom based education. "OCW is not meant to replace degree-granting higher education or for-credit courses. Rather, the goal is to provide the

content that supports an education" Kirkpatrick (2006). It will help people by providing knowledge which they are getting from the current education means. Huijser, Bedford, and Bull (2008) concluded in their paper that the provision by educational institutions of OCW has the potential to play an important role in assisting people to become (or to remain) socially included, productive members of wider society, by providing them with resources they need to participate in lifelong learning.

127 million visits to OCW content from an estimated 90 million visitors as of Oct 2011 (MIT Open Course Ware Program Evaluation Findings Summary, 2011). This report also highlighted the effective utilization of OCW website by the educators, students and self-learners for wide range of purposes.

The impact of online learning on learning has been significantly high in accordance to many research findings.

Many research studies explored OCW in terms of its origin, development, access to OCW websites and utilization but focuses majorly on MIT open course ware and its adaptation done by other universities (Gomez at al., 2012). Terrell and Caudill introduced the open course ware movement, its scope, and also how the materials may be applied to traditional educational environments (2012). Some of them presented scenario of the open course ware initiatives in India and in the world (Avineni and Pusapati, 2012). Çakmak, Özel and Yılmaz evaluated the Turkish Open Course Ware (OCW) initiative and revealed that how universities, lecturers/academics and other institutions contribute to this initiative (2013). Some studies highlighted various types of benefits and barriers of the open course ware. Although recent studies are focusing on MOOCs (Massive Open Online Courses), its origin, development, access in terms of enrolment and course completion, evaluation and grading system. However OCW provider organizations are now become big MOOCs provider like MIT, Coursera, NPTEL etc.

From the past studies, many aspects of OCW came into focus and also some aspects have emerged for further research like structure,

distribution format and effective utilization of open course wares by the learners. Therefore researcher decided to identify the factors associated with the utilization the open course ware by the students.

Objective

To study the factors associated with the utilization of open course ware as perceived by students of Higher Learning Institutions.

Sample

Total 418 students were selected randomly as sample. The sample comprised undergraduate and postgraduate students and belonging to urban, semi-urban and rural areas. Out of 418 students, 60.5% were male and 39.5% were female. 56% students were below 21 years of age whereas 44% were from above 21 years age. In the present sample, 21.8% were from rural area, 22.7% were from semi-urban area whereas 55.5% were from urban area. In terms of educational qualification, 60.5% were undergraduates whereas 39.5% were postgraduates.

Research Tool

To study the factors associated with the utilization of open course ware amongst the students **utilization scale** was developed by the investigator. First draft of scale prepared by the investigator contained 24 items, which was given to the experts of the field for the assessment. Experts suggested deletion of 6 items and alteration in some items of scale. After incorporating experts' suggestions second draft of the tool contained 18 items. Item analysis was done with the help of item total correlation. After item analysis six items were removed from the scale. Hence, final draft contained 18 items of utilization towards open course ware. These 18 items represents attributes of utilization of OCW. The items which were deleted were not directly associated with the attributes of the utilization.

Each statement of the scale was rated on a five point scale from Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD) and the score ranged from 5 to 1.

The standardization of tools were done by item analysis, reliability and validity. Split half was found to be 0.805. Content validity was established.

Procedure OF Data Collection

The data were collected by adopting random sampling technique. The research tool developed by the investigator was given to 418 randomly selected students. The students were surveyed using online and offline mode. For the online mode, tool was created using Google Docs technology and a web link was provided by the Google Docs to access and fill the responses online. This web link was mailed to randomly selected sample. While offline mode, printouts of research tool was distributed amongst randomly selected sample and collected back their responses.

Analysis

The collected data were analyzed with the help of factor analysis.

Results

Factors associated with Utilization of Open Course Ware

Table 1.1: Rotation Sums of Squared Loadings, Percent of Variance and Cumulative Percent of extracted three factors for Utilization of OCW

Rotation Sums of Squared Loadings		
Total	**% of Variance**	**Cumulative %**
4.075	22.640	22.640
3.160	17.555	40.195
2.827	15.706	55.901

From the above table it is clear that first factor has 22.64 percentage of variance, second factor has 17.555 percentage of variance and third factor has 15.706 percentage of variance. The total percentage of variance for these three factors is 55.901. Factor wise loading is given in following tables:

Table 1.2: Factor Loading for First Factor of Utilization of OCW

S. No.	Name of the Variable	Factor Loading
1.	I access it any time as per my convenience.	.772
2.	I access difficult topics again and again as to deeply understand them.	.771
3.	I access topics/subjects of my choice/interest.	.749
4.	I learn it to improve my knowledge or skills.	.649
5.	I access it free of cost, no registration/subscription required.	.646
6.	I access it from any place as per my convenience.	.619
7.	I access it at my preferred pace.	.618
8.	I enrich my knowledge towards my course.	.503

First factor loaded by eight variables of utilization of OCW like access OCW as per convenience of time and place, according to choice and learning pace and to gain knowledge of topic of subject. It contains factor loading from minimum 0.503 to maximum 0.772.

Table 1.3: Factor Loading for Second Factor of Utilization of OCW

S. No.	Name of the Variable	Factor Loading
1.	I generally access it in my language as well as English.	.718
2.	I also access it on new media devices like smart phone, tab. etc.	.685
3.	I access it for doing research.	.680
4.	It helps me in preparing assignments & projects.	.652
5.	I frequently download its content.	.640

6.	I also access those subjects which are not available in my curriculum.	.582

Second factor loaded by six variables of utilization of OCW like access OCW in regional language as well as in English, on new media devices, for doing research and preparing assignments and download its content. It contains factor loading from minimum 0.582 to maximum 0.718.

Table 1.4: Factor Loading for Third Factor of Utilization of OCW

S. No.	Name of the Variable	Factor Loading
1.	I access it in audio-visual mode.	.764
2.	I access its graphics & animation utility.	.761
3.	I easily search & access any topic.	.698
4.	I easily understand the content because they are self-explanatory.	.640

Third factor loaded by four variables of utilization of OCW like access OCW in audio-visual mode with graphics & animation utility, easy search & access of any topic and easy to understand self-explanatory content. It contains factor loading from minimum 0.640 to maximum 0.764.

On the basis of commonness in items the following names were given to the factors:

Table 1.6: Names of Factors Associated with Utilization of OCW

S. No.	Name of the Factors
1.	User-flexibility
2.	Choice-based Access
3.	Content Delivery

Conclusion

The three utilization factors of open course ware namely **user-flexibility, choice-based access and content delivery** were created on the basis of students' perception. This is obvious because all these factors are the characteristics of open course ware or any e-learning system. OCW provides user to access it as per their convenience, anytime, anywhere, as per their choice and without any cost. Arendt and Shelton (2009) indicated these factors as benefits in their review. Tarhini, Hone, and Liu (2013) constructed five factors - perceived usefulness, perceived ease of use, subjective norm, perceived quality of work life and behavioral intention which affect students' acceptance of e-learning environments. First two factors perceived usefulness and perceived ease of use are closely related to the utilization factors of this study. Selim (2007) also measured four Critical Success Factors (CSFs) of e-learning from student perceptions, technology infrastructure factor is one of them which is closely related to findings of the current study.

The three factors of utilization of open course ware namely User-flexibility, Choice-based Access and Content Delivery were identified. These factors actually show the strength of the OCW. OCW is a learner centric model where learner has freedom to access as per their choice and convenience.

Implications of the Study

The three utilization factors namely user-flexibility, choice-based access and content delivery of open course ware are helpful in understanding the courseware because these factors shows that content and its delivery should be user centric. Findings of this study will be helpful for subject experts, OCW providers, OCW developers, and researchers. Content provided by the expert should be new and presented in small steps so that it can create interest and encourage flexibility in learning. Every learner can study OCW by his/her own. OCW providers and developers should focus on user friendly model so that learner can access OCW with ease. This involves use of technology in delivery, use of graphics and animation in presentation and simple user interface. Researchers in the field of OCW can further

study these factors individually towards utilization as well as they can study utilization of available OCW content in relation to these three factors.

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Technology as Cultural Capital: Students Negotiating Access and Use of Technology in a Private School

Nitika Bose

Research Scholar, Delhi University

Email: bosenitikajmi@gmail.com

Abstract

The current research draws from Bourdieu's conceptualization of cultural capital to understand the ways in which lack of access to and knowledge of use of technology causes school disadvantage for students belonging to economically weaker sections. The present study highlights the ways in which the absence of technological knowhow can be detrimental to everyday teaching learning within a private school in Delhi thereby necessitating the need to bridge technological gaps.

Introduction

Equality of educational opportunities has been one of the major goals within the educational policies in India. Right to Education Act, 2009 mandates that every child from 6-14 years has a fundamental right to education. To ensure that no child is left behind the act includes modalities that facilitate sending all children to schools. The current policy also mandates 25 per cent reservations for children belonging to economically weaker sections in private unaided schools. This attempt has been significant to bring to a culmination the prevalent school-created divide ensuing from children of economically well off sections attending private schools and children of families belonging to economically weaker sections attending government schools. The act therefore is committed to end disadvantages related to unequal access and opportunities within the education system. Crucial to this endeavor

is taking adequate measures to upgrade teaching-learning wherein the difference between the ethos of child's home and school can be mediated through effective teaching adopting methodologies that enables meaningful inclusion without distorting child's self-esteem and preventing a sense of lack related to one's family background. Besides proper training of teachers, it is important to address the 'digital divide' among different social classes within schools. Throughout my stay as a teacher-volunteer in a private school, I was directly able to observe the inequalities related to access and use of information and communication technology around which a major portion of the curriculum was structured during everyday teaching learning. The present research explores the disparities in technology access and knowledge existing within private schools now admitting students from economically weaker sections mandated by the RTE Act, 2009. The present research reveals that digitization of education serves as a cultural capital detrimental to the meaningful inclusion of students from economically weaker sections in private schools.

Theoretical Background

The concept of cultural capital was developed by Pierre Bourdieu to highlight the ways in which social advantage is reproduced through schools despite the fact that centralized state education system was committed to ensure equality of educational opportunities to all. Bourdieu's theory thus challenged the prior assumption that social position is based on natural talent or intelligence as a basis of social advantage earlier thought to be genetically transmitted. Bourdieu and Passeron (1979) point that children of upper class parents and middle class parents in France have much higher chances of entering tertiary education than children of agricultural laborers and workers. According to Bourdieu, the distribution of capital among classes determines chances of success within practices. While 'economic capital' is directly convertible into money 'cultural capital' can be transformed into economic capital through cultural manifestations such as acquiring educational qualifications for the betterment of life chances (Bourdieu 1986:243). The present school system according to

Bourdieu recognizes and rewards the cultural manifestations of upper classes within society thus reproducing educational inequalities which undermines the cultural symbols of economically weaker sections. Cultural capital is thus differently formed based on experiences and conditions of existence of diverse social classes. Bourdieu further uses the term 'habitus' to define, a '*system of durable, transposable dispositions'* (Bourdieu 1977: 72) which produces a world-view and ways of operating in the world creating commonalities among members of a certain class and differences with members of other classes. Within school systems cultural differences are reproduces wherein the school recognizes, appreciates and rewards certain kinds of attitudes and abilities, and disfavors others (Bourdieu and Passeron 1990). The cultural capital formed due to experiences within ones habitus accrue to differences in the ways in which children learn and the kinds of knowledge acquired by them building cultural and cognitive capabilities ensuring scholastic success or failure. The criteria of acceptance and success within the school system identifies itself with the cognitive and cultural abilities of middle classes and hence school success is not based on an innate ability *by itself,* but greater success rates is ensured to classes whose habitus constructs experiences valued within the school system (Bourdieu and Passeron 1979).

The broad definition of cultural capital has been further expanded by scholars to study the relationship between cultural capital and technology. Scholars have further studied how the distribution of access and use of technology among different social classes known as 'digital divide' creates experiences that favor or disfavor school success.

Emmison and Frow (1998) argue that familiarity with the use of technology can act as an added advantage for families who possess the knowledge of the same serving as cultural capital acting as an advantage to the upper classes. They pointed those computers as machines which serve as objectified cultural capital and ability to use them form embodied cultural capital providing additional advantage to

families having positive disposition towards bourgeoisie technology during the information age.

Warschauer (2003) applied the theory of cultural capital to assert that physical access to technology cannot end digital divide between social classes. Rather, he points that both access to and knowledge of how to use technology will bring about meaningful social inclusion. Therefore he suggests that not merely access to but the ability to be able to use technology adequately can bring about social inclusion.

Cushman and Klecun (2006) study the non-users of information and communication technologies to understand their needs and demands and suggest strategies to address their needs. Their research suggests that there is a close link between personal circumstances such as parenthood, age and income and computer ownership and use. The research also shows that many non-users within families were also women. The study points to the limits of the techno-rational discourse of ICT which mandates its use as a necessary route for an efficient future. Their research rather document a fear for computers, apprehensions about inability to use and control it and anxieties related to being left behind of feeling like an illiterate in the near future governed predominantly by ICT. The research points that exclusion related to use of ICTs can end with better curricula and classrooms but the most effected by digital exclusion are least likely to come forward for such ventures.

Mattei (2012)points that lack of economic and social resources contributes to creation of a 'digital divide' between different social classes within the university. She points that the lack of physical access and knowledge related to the use of technology creates disadvantage in schools and impediments in access to college and careers. She suggests that schools must work proactively to end this digital divide for equaling educational opportunities.

Methodology

The method of participant observation was used for conducting the research followed by informal interviewing which helped understand

the ways in which technology access and use within schools leads to perpetuation of inequality and the ways in which technology serve as cultural capital for access to school-related opportunities.

As a post graduate student in sociology, my interest in the phenomena of private-schooling emerging from the 25 per cent reservation for the economically weaker sections mandated by the Right to Education Act, 2009 made me volunteer as a teacher in one of the private schools located in Delhi for a period of eight months. My emphasis soon became focused on the use of technology by the students within the organization. During my stay within the school, I took part in all the processes related to teaching-learning, organization of co-curricular activities and administrative responsibilities within the school. This gave me an opportunity to closely interact with students, other fellow teachers and observe the ways in which everyday negotiations take place within the school premises. Throughout my stay, I worked closely with seven students (5 girls and 2 boys) belonging to economically weaker sections from classes VIII to X.

The present study helped me to immerse myself within the culture of the organization and understand its associated problems. The chosen sample has been kept small to study in depth the ways in which technology influences the experiences of students. As I was working with a small number of students within a limited environment, the study does not claim to make any generalizations. Nevertheless the identified themes within the study provide valuable insights providing scope for further research in this area.

Findings

The data collection process brought to light many significant themes related to technology operating as cultural capital within the private school premises.

The first recurrent theme was **lack of physical access to technology at home** relevant for everyday teaching-learning within schools. Students within the study reported that a lot of school work was expected to be shared among teachers and fellow students through Google

Classrooms. A regular trend within the school was to upload urgent and important information on Google Classrooms through which students' accessed notes and shared information related to home tasks and doubts were taken into consideration.

EWS student: One day we came to school and saw that all other students had lots of information related to Mughal Empire and its demise. All of them knew what they were supposed to do in class. They came to know about the task assigned through EDMODO. I was blank as the photocopy machine in school went bad. Teacher then asked us to help others in class.

Students from economically weaker sections often reported bothering within classrooms. The use of terms like 'us' and 'them' represents perception related to those who had easy access to technology at home and those who did not. It was found that students belonging to economically weaker sections remained aloof of school's attempt to teach and learn through technology. EWS students were often given photocopies unlike the others who could easily access technology at homes. Thus information related to class work and important notes reached them much later than their fellow students.

The second theme that emerged was **lack of confidence** experienced by students from economically weaker sections related to the use of technology within classrooms. Within the school, Mac-books were issued for students through which classroom teaching took place on a day to day basis. It was found that students belonging to economically weaker sections experiences discomfort and relied on help from others for completion of assigned tasks. It was observed that boys fared better than girls in such endeavors.

EWS student (boy): Using Mac book is fun. If I don't know, I can ask my friends. Earlier I hesitated but I know there is no point. I must learn to do well in future.

EWS student (girl): Some students in classroom know everything. They keep talking about this app and that app. I am an introvert, I know what I know and I do not show off.

EWS Students acknowledged lack of awareness related to technology and stated that they felt more confident when classroom activities were not directly related to technology. Students stated that other classmates from well off sections owned personal smart phones which made them adept to the use of Mac-books and tabs provided within schools for everyday teaching learning. Students also experienced difficulty in accessing EDMODO, a programme used for sharing school and class related information.

The third theme that emerged was **unequal opportunities** available to students from economically weaker sections fostered by the use of technology as an integral part of school curriculum. The process of Formative Assessment within the schools often mandated the use of internet providing an added advantage to students from economically well off sections. In a discussion organized in one of the classes, it was seen that students from the well off sections presented much better arguments gaining insights from researches available on the internet.

EWS Student: The Varna system had four castes: Brahmin, kshatriyas, vaishyas and shudras. Untouchables remained outside the caste system and they were exploited by others. Untouchability was abolished by Article 17 of the Indian constitution.

Economically well off student: Traditionally there were four castes in India and numerous jatis or sub castes. Modern day Dalits were earlier considered untouchables and their shadow polluted the upper castes. A recent internet survey shows that caste system exists even today as people choose to marry within their own caste. World over Indians, behave according to caste for personal and religious purposes.

Examples from contexts other than the prescribed texts used by students from economically well off sections during the presentation reveals a worldview beyond the immediate environment. Students from economically weaker sections stated that they preferred resources other than technological ones such as libraries. Students realized that work could be done efficiently and in lesser time through the internet, but they could not rely much on a single computer period in a week for the same.

Students also stated that they experienced **financial burdens** associated with home tasks and co-curricular activities that required the use of technology on a regular basis.

EWS student: Last night my father came home and went back again to his work place to get print outs for my science project. Chakrapani sir is helpful but you cannot keep on asking all the time for small small favors.

EWS student: I knew I would score less. Stuti used Prezi for her science presentation. As her father works in a multi-national, she can access the software easily. Prezi made it look good automatically.

Student stated that they had to rely on cyber cafes for print outs required in projects, sharing documents and researching for assignments. Some students stated that for getting information related to group-pages created on the internet and for sharing school related material and knowledge; they often relied for support on their parents who worked for middle class employees.

The last theme that emerged was an **experience of sense of exclusion and doubt** that students from economically weaker sections reported. Students stated that although teachers tried their best to create a technologically inclusive ethos, a sense of exclusion, however, occurred latently when they always came to know about assigned work later than their counter parts due to inaccessibility to computers. Some students stated that their school believed that the use of technology reduced wastage of paper was appropriate in principle, however they felt discouraged and in self-doubt when print outs were distributed for EWS students unlike other fellow students who could access computers at home.

EWS student: I hate it when others get to know everything through gadgets and we are given photocopies. It makes me feel out-dated. We sometimes feel we belong to the Mughal era.

EWS student: I am waiting for the day my father buys a computer. Photocopies are a waste of paper and we must save paper.

EWS students reported a sense of discrimination as they stood out during classroom processes related to technology. EWS students also stated that technology-neutral classrooms represented medieval mindset. Moreover students felt bad about not being able to contribute to causes that they supported unlike their well off counterparts. Most students realized that use of technology prepared them for a better future but pointed that schools should provide more facilities and conduct workshops related to technological-literacy.

The current research shows that technological knowhow serves as cultural capital for students belonging to well off sections in private school. Bourdieu concept of cultural capital serving as disadvantage to the working classes was clearly evident in this research wherein students' lack of access and knowledge related to use of technology manifest in unequal educational opportunities and inhibit quality education. The study therefore points that technological gaps can be abridged provided policy makers take measures suitable to all.

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FACULTY OF EDUCATION
JAMIA MILLIA ISLAMIA
NEW DELHI-110025
seat.educationfaculty@jmi.ac.in