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FNA, FASc., FNASc., J.C. BOSE Fellow
Vice Chancellor

प्रोफेसर तलत अहमद
एफएनए, एफएएससी, एफएनएससी, जे.सी. बोस फैलो
कुलपति

پروفیسر طلعت احمد
ایف این اے، ایف اے ایس سی، ایف این اے ایس سی، جے سی بوس فیلو
شیخ الجامعہ

Vice Chancellor's Message

The Faculty of Education brings out its fourth issue of Jamia Journal of Education-An International Biannual Publication which reflects its endeavor to participate in the developments that take place in the field of education round the globe. I am happy to note that the theme taken up for the current issue holds a great significance as education and ICT together can accelerate the pace of progress of any nation. I believe that the articles and research papers included in the journal would definitely pave way for further exploration of the field discussed.

I am sure that the faculty would ensure the wider circulation of the journal in order that more contributors and readers should be associated with the same.

I congratulate all those who put in their efforts in getting it published.

(Prof. Talat Ahamad)

EDITORIAL

The development of education has travelled a long way across the world. However, with the quantitative expansion of education, the education systems are being restructured and overhauled world over lest quality should take a backstage. Hence, the teacher education programmes need to be designed in such a manner where the prospective teachers are provided exposure to the happenings around the world so that they need not struggle when it comes to teaching in a heterogeneous classroom. Research findings suggest that in order to promote diversity, the role of teachers is immense. And therefore, there is a need to introduce more and more innovative practices in the schools which could be possible only when the entire teacher education programmes are restructured. Significantly, to keep pace with the global developments, the NCTE has revised its teacher education programmes to help the teacher education institutions prepare teachers for the 21st century.

In addition, there is a need to establish linkage between education and the Information and Communication Technology (ICT) which can together contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance and administration. Moreover, UNESCO takes a holistic and comprehensive approach to promoting ICT in education. Access, inclusion and quality are among the main challenges they can address.

Taking above developments into cognizance, the members of the Jamia Journal of Education-An International Biannual Publication has therefore decided to keep Education and E-Learning as its theme for its fourth issue.

We are happy that we received a number of both scholarly articles and research papers on the theme from different colleges/Universities across the nation. However, it was not possible to accommodate them all and those which are included in the journal they are there by virtue of their merit.

We believe that we would continue to receive such contributions from teacher educators, educational administrators, policy makers, research scholars and of all those who are engaged in the field of education in different capacities in future as well.

Editors

Effect of Computer Literacy and Access on the Attitudes towards Computer as an Instructional Aid among Rural and Urban Secondary School Teachers

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Backdrop of the Study

Due to population explosion and increase in enrolments since independence, the question on how to handle learning activities and problems of students by few teachers is vital. There are many educationists and psychologists who have been trying to find out ways in which electronic information processing may help the teacher in individual instruction. One of the important and prominent approaches is to use computer as a teaching machine. This approach is referred to as Computer Assisted Instruction abbreviated as CAI.

Various computers that are used to aid instruction include storage of information about learning resources, storage and analysis of data about learners, prescription of lessons based on learner's data, drill and practice, simulation and gaining, computational aid/problem solving tutorial instruction and dialogue. The studies conducted by Totter (1990), Schug (1988), Jorde (1987), Knelles (1975) and also Johnson and Stanne (1986) found that the usage of computers is good for drill, practice, problem solving, learning concepts and attention and individualise instructions. These findings are further supported by Girijesh (1991), Sharma (1979), Sander (1986), Apple (1987), and Hativa's (1988) study.

Rationale for the Study

The introduction of computer literacy or "computeracy" in short, even today, appears to induce a kind of "fear of the unknown" in very many people including students, parents, teachers and educational administrators. To them the announcement, "The computer is coming" amounts to being psychologically pushed into an area where they will have to face with an adversary equipped with the impregnable armory of higher mathematics and electronic wizardry. The introduction of computer in general education in advanced countries has created fear in the teacher community that the use of CAIU in teaching-learning will

relegate the place of the teacher and to some extent eliminate teachers from teaching scene. These views are proved in the research studies of Mc Adoo (1993) and Miller (1993). But the fear is baseless, because as a matter of fact, the CAI may become a powerful tool for the teacher in the instructional process. No doubt, the role of the teacher has changed from his conventional assignment of delivering lectures to a guide and a problem solver. It directly interacts with the students individually and with the teacher. Human teachers have to play their role in CAI. It also increase the efficiency and satisfaction of teacher as a tool. It also proves to be a powerful device for a teacher to compute and evaluate the huge data of student's performance, more accurately, rapidly and promptly. CAI relieves the teacher from more mechanical and routine work. He can devote his time for more creative works like planning, curriculum revision, guidance and human relations. Keeping these advantages and unwanted fears of teachers towards computer, the present investigation was attempted to know the attitudes of rural and urban teachers towards computer as an instructional aid in addition to effect of computer literacy and access to computer.

Objectives

The main objective of this research work is to assess the attitude of rural and urban secondary school teachers towards computer as an instructional aid. It was also planned to investigate the effect of a few biographical variables of teachers on their attitude.

Hypotheses

The hypotheses being tested in this study are as follows:

1. Teachers from different locality (rural/urban) will have different attitude towards computer as an instructional aid.
2. Teachers who have computer literacy and access to computer will have positive attitude towards computer as an instructional aid than those not having computer literacy and access to computer.
3. Biographical factors of teachers will have a bearing on their attitude towards computer as an instructional aid.

Method

Sample: The present study was carried out in schools of Bangalore city and Bangalore rural. Using stratified proportionate random sampling technique, 150 rural and 150 urban secondary school teachers giving representation to sex and type of school management were selected.

Tools

1. An information schedule was developed and used to collect information on levels of computer literacy and access to computer in addition to the information on biographical variables of teachers.
2. Attitude towards Computer Assisted Instruction Scale: This scale was constructed and standardized and was used to measure the attitudes of teachers towards computer as an instructional aid.

Results and Discussion

Tables 1 and 2 indicate the number and percentage of teachers having or not having computer literacy and access to computers. It clearly shows that only 46.67% (N=140) of rural and urban teachers possess computer literacy, though, 66.67% (N=200) have the access to computers. The table also shows that still 53.33% of teachers need to become computer literates and 33.33% of teachers should get access to computers within a distance of 1 Km.

Table 1: Showing the frequency and percentage of Teachers with Computer Literacy and access to Computers

S. No	Variable	Frequency (N)	Percentage	Total %
1,	***Computer Literates***			
	a) Literates	140	46.67	
	b) Non-literates	160	53.33	100
2.	***Access to Computer***			
	a) Access	200	66.67	
	b) Non-access	100	33.33	100

Table 2: Showing level of Computer Literacy and Distance of access to Computer

S. N	Variable	Frequency (N)	Percentage	Total %
1,	***Level of Computer Literacy***	42	30	
	a) High Literacy	46	32.86	100
	b) Moderate Literacy	52	37.14	
	c) Low literacy			
2.	***Distance of computer access***	100	50	
	a) Within school	40	20	100
	b) In immediate			
	c) Surroundings	60	30	
	d) Within a distance of 1 Km			

Table 3 clearly shows that teachers with high SES possess more computer literacy (63.57%) as compared to their counterparts. The table also indicates that science teaching and the teachers with below 40 years of age possess more computer literacy (65.7% and 69.28% respectively) as compared to Arts teachers and teachers with above 40 years of age with regard to sex and educational qualification of teachers, though there is not much difference. Still we can see from the same table 5 that male teachers and teachers with over and above qualification possess more computer literacy (57.14% and 53.57% as against 42.86% and 46.43% respectively) than their counterparts.

Table 3: Showing Frequency and Percentage of Teachers with different background Variables having Computer Literacy

Sl. No.	Variable	Frequency (N)	Percentage	Total Percentage
1.	***SES***			
	a) High	89	63.57	100
	b) Low	51	36.43	
2.	***Subject taught***			
	a) Arts	48	34.28	100
	b) Science	92	65.71	
3.	***Educational Qualification***			
	a) Over and above	80	57.14	
	b) Required	60	42.86	100
4.	***Sex***			
	a) Male	75	53.57	
	b) Female	65	46.43	100
5.	***Age***			
	a) Below 40	97	69.28	
	b) Above 40	43	30.70	100
6.	***Type of School Management***			
	a) Private Aided	49	35.00	
	b) Private unaided	64	45.71	100
	c) Government	27	19.29	

Table 4 shows the computer literacy and access to computer among rural and urban teachers. It can be seen from the table that urban teachers possess more computer literacy (75%) as well as access to computer (70%) as compared to their counterparts in rural schools. From the same table 4, it can also be seen that only 30% of the teachers have access to computer as compared to the urban teachers, who have 70% access to computer at different distances. From this, it can be clearly inferred that access to computer enhances computer literacy.

Table 4: Showing Frequency and Percentage of Rural and Urban Secondary School Teachers having Computer Literacy and Access to Computer within a distance of 1 km.

S. No	Variable	Frequency (N)	Percentage	Total %
1,	***Locality and Computer Literacy*** (N=140 computer literates)			
	a) Rural	35	25.00	
	b) Urban	105	75.00	100
2.	Locality and access to computer (N=200 having access to computer)			
	a) Rural	60	30.00	100
	b) Urban	140	70.00	

The data in Table 5 indicate the attitudes of rural and urban secondary school teachers towards computer as an instructional aid belonging to different background variables.

It can be clearly seen from Table 5 that locality (rural and urban), age, subject taught, and SES have a strong effect on the attitudes of secondary school teachers towards computer as an instructional aid.

Table 5: Attitudes of Rural and Urban Secondary School Teachers with different background variables towards Computer as an Instructional Aid

S. No	Variable	N	X	S.D	't'	Level of significance
1.	***Locality***					
	a) Rural	150	141	17.4		
	b) Urban	150	167	18.4	12.5	P<0.01
2.	***Sex***					
	a) Male	160	159	14.8		
	b) Female	140	156	13.1	1.86	P>0.05
3.	***Age***					
	a) Below 40 years	155	164	16.3		
	b) Above 40 years	145	147	15.78	9.20	P<0.01
4.	***Educational Qualification***					
	a) Over & above qualification	157	155	15.4		
	b) Required Qualification	143	152	16.0	1.65	P>0.05
5.	***Subject Taught***					
	a) Arts	168	153	17.8		

	b) Science	132	171	16.9	8.94	P<0.01
6.	***SES***					
	a) High	147	168	18.5		
	b) Low	153	154	17.3	6.76	P<0.01
7.	***Type of School Management***					
	a) Private Aided	49	158	17.3		
	b) Private Unaided	64	164	18.5	1.78	P>0.05
	a) Private aided	49	158	17.3		
	b) Government	27	146	16.9	2.94	P<0.01
	a) Private unaided	64	164	18.5		
	b) Government	27	146	16.9	4.5	P<0.01

Urban teachers, younger teachers, teachers teaching science subjects and teachers with high socio-economic status were found to possess the positive attitudes towards computer as compared to their counterparts.

It can also be seen from the same table 5 that though sex and educational qualification did not seem to affect the attitudes of teachers towards computer as an instructional aid, but, still male teachers, and teachers with over and above qualification found to have a positive attitude towards computer as an instructional aid, though the results are not significant statistically.

Table 6 shows the attitudes of teachers towards computer as an instructional aid, with or without computer literacy and access to computer. It can be seen from the same table 6 that teachers with computer literacy and access to computer possess a very high positive attitude towards computer as an instructional aid as compared to non-literates and teachers without access to computers. From the same table 6 it can be clearly inferred that computer literacy and access to computer can develop positive attitudes towards computer as an instructional aid.

Table 6: Showing attitudes of Teachers towards Computer as an Instructional Aid having or not having Computer Literacy and access to Computer

Sl. No.	Variable	N	X	S.D	't'	Level of significance
1.	***Computer Literacy***					
	a) Literates	140	181	16.3		
	b) Non-literates	160	150	17.1	15.80	**
2.	***Access to Computer***					
	Having access	200	164	18.8		
	Not having access	100	153	17.9	4.92	**

** P< 0.01 level.

Educational Implications

We are on the verge of an educational reform that will have pupils learning for themselves because they love what is presented and available to them. Educators at all levels need to review the existing curriculum to determine where and how these "new basis" might be taught and integrated. In this way, we may begin to prepare our students for life in the information age, an age which they will shape and direct and one in which they will ultimately lead us. That is why various machines like calculators, tape-recorders, TVs, videos, and computers have entered even in the field of education and subsequently in schools.

CAI can help in the situation where the teacher is not able to perform his/her duty as competently or where the student derives individual instructions or where immediate solutions are to be presented to students as change of parameters.

It has been rightly observed by NPE (1986): "Computer can play an important role in enhancing the efficiency of the teaching-learning process to make children more creative and provide them with individualized learning environment. The demands of equity would therefore require that computer literacy programmes progressively be integrated with curriculum at lower secondary and elementary level".

CAI proves better than all other aids in several respects. There is not only saving of time but also processes the performance data and determines subsequent activities in learning situations. The dynamic interaction between the student and instructional programme is not possible to be secured in any other medium. It also individualizes the materials completely.

In a vast country like India, where students come from varied backgrounds with varied aptitudes, interests and capacities, should be respected and recognised individually. It is here that a computer can serve as a 'boon' to fulfil our desired aims. In order to enjoy the benefits of computers, our teacher need to change not only their attitude towards computer as a barrier, but also develop computer literacy to meet the demands of the changing society.

Conclusions

A study by Suma George (1995) investigated the attitudes of teachers towards computer assisted instruction in the city of Bangalore found that nearly 75% of teachers were reluctant to use computer as an

instructional aid. Now with the increase in computer literacy and access to computer the attitudes of more or less same teachers are favourable, with only 25% of teachers having unfavorable attitude. This clearly indicates that higher access to computer and computer literacy develops not only positive attitude among teachers towards computer as an instructional aid, but also relieves them from the unwanted fear that computer will relegate their position in education.

Hence, in this age of information technology, every teacher should be computer literate to keep pace with the expansion of knowledge and meet the challenges of society.

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Cloud Computing for Educational Transformations

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Technology makes the world as it has had unprecedented impact on economic growth and social development in India. Everyone uses technology from children and teenagers to adults and elders. Technology influences the people- we stay in contact with, type of information we consume, the way we consume it, and what we do with it. Technology is vital in today's world and makes everything easier.

Technology plays a decisive and beneficial role in advancing the well being of all sections of our society. The nation continues to be firm in its resolve to support science and technology in all its facets. It recognizes its central role in raising the quality of life of the people of the country, particularly of the disadvantaged sections of society, in creating wealth for all, in making India globally competitive, in utilizing natural resources in a sustainable manner, in protecting the environment and ensuring national security.

The department of Science and Technology; Government of India, has wide varieties of activities ranging from promoting high-end basic research and development of cutting edge technologies on one hand to service the technological requirements of the common man through development of appropriate skills and technologies on the other. India, envisions a "Digital India," where ubiquitous high-speed Internet access will empower the entrepreneurs to build software and other technology products that will raise the standard of living in a country. This will initiate the creation of more technological jobs, increase electronic manufacturing, and provide Internet and Internet speed availability to thousands of Indian villages. The vision of Digital India programme is to transform India in to a digitally empowered society and knowledge economy.

Digital Technologies which include Cloud Computing and Mobile Applications have emerged as catalysts for rapid economic growth and citizen empowerment across the globe.

Objective of the Paper:

To analyze the characteristics, application and challenges of cloud computing in the field of Education.

What is Cloud Computing?

The term cloud computing is everywhere. The word 'cloud' is used as a metaphor for the internet so the phrase 'cloud computing' means a type of Internet-based computing, where different services-including servers, storage and applications, are delivered to an organization's computers and devices through the Internet.

In its most simple description, cloud computing is taking services and moving them outside an organizations firewall on shared systems. Applications and services are accessed via the Web, instead of hard drive. For it to be considered cloud computing one need to access the data or programs over the Internet, or at the very least, have that data synchronized with other information over the web.

Meaning of Cloud Computing:

- It is a model for enabling ubiquitous network access to a shared pool of configurable computing resources.
- It stores and access data and programmes over the Internet instead of computer's hard drive.
- It provide the tools and technologies to build data/compute intensive parallel applications with much more affordable prices compared to traditional parallel computing techniques.

The popularization of the term can be traced to the year 2006 when Amazon.com introduced the Elastic Compute Cloud. Cloud computing is the result of evolution and adoption of existing technologies and paradigms. The goal of cloud computing is to allow users to take benefit from all of these technologies, without the need for deep knowledge about or expertise with each one of them.

Microsoft also offers a set of Web apps, now called Office Online, that are online only versions of Word, Excel, PowerPoint, and One Note accessed via Web browser without installing anything. That makes them a version of cloud computing. The main enabling technology for cloud computing is virtualization. Virtualization software separates a physical computing device into one or more virtual devices, each of which can be easily used and managed to perform computing tasks.

Characteristics:

We can find that almost every cloud has the following core characteristics:

- *Virtual nature:* These servers become a massive pool of resources. Divide this pool into multiple virtual servers, and we can create a cloud.
- *Security*: It can improve due to centralization of data, increased security-focused resources, etc.,
- *Flexible:* Since virtual servers aren't physical, they are super flexible, giving you what you need at the moment. Spin up a server in minutes, and take it down just as easily.
- *High Performance*: Performance based on the availability of networks.
- *Affordable*: Maintenance of cloud computing applications is easier, because they do not need to be installed on each user's computer and can be accessed from different places. Its cost saving.
- *Location independence*: enable users to access systems using a web browser regardless of their location or what device they use
- *Reliability:* improves with the use of multiple redundant sites, which makes well-designed cloud computing suitable for business continuity and disaster recovery.
- *Broad network access.* Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).

Types of Cloud Computing

According to Johnson, Levine and Smith, 2009, Cloud computing is a general term for anything that involves delivering hosted services over the internet. Cloud computing services are generally regarded as falling into three separate categories or levels:

i) **Infrastructure as a Service (IaaS):** Its a lowest level of Cloud Computing Service. Here customers can rent basic computing resources such as processors and storage, and use them to run their own operating systems and applications. e.g., Amazon's Elastic Compute Cloud. Organizations can use this infrastructure

to run Linux servers on virtual machines and scale up usage as required.

ii) **Platform as a Service (PaaS):** It is the next level up. This enables customers to install their own applications using a platform specified by the service provider. Google Apps Engine is an example, where developers can write and install applications using the Python language.

iii) **Software as a Service (SaaS):**It is the highest level of cloud computing service. This is currently of most interesting in education. Not only data is stored in the cloud but the application also, with the user requiring only a web browser. The best-known examples are Google Apps for Education and Microsoft Live@edu which provide communication and office applications such as E mail and spreadsheets.

Application of Cloud Computing in Education

The safety, stability, and ease-of-use of cloud computing in education result in widespread adoption in educational institutions of all sizes and types. Examples of schools embracing virtualization and benefitting from using cloud computing in education are many. Schools are exploring ways in which a centralized virtual data centre can further enhance the pupils' experience. The usage of information technology by the universities, colleges and schools for imparting the training programs are gradually increasing.

Educational institutions are also beginning to use lower level cloud services for purposes such as data storage. This may be attractive when data security is of lower concern where video and audio is provided as open educational resources. Another use of cloud computing which is beginning to emerge in education is the hosting of institutional learning management systems (LMSs) in the cloud. Outsourcing the provision of LMSs such as Blackboard or Moodle to a third party makes sense for institutions that cannot justify the costs of purchasing, maintaining and supporting hardware and software themselves.

Cloud services could be a cheaper option for schools that face funding cuts, yet still have to invest in technology to improve learning standards. The info graphic at the bottom of this article gives a good overview of possible cost-savings. If a school that currently stores its software and data locally, moving to the cloud will allow them to spread out IT costs through flexible subscriptions. Such software is a

cheaper alternative to the large costs associated with upfront licenses.

Google and Microsoft's cloud productivity apps allow schools to pay for their cloud programmes on demand. Cloud services nicely complement what research has discovered about the benefits of tablets: how their mobility and flexibility leads to greater collaboration and engagement. With cloud computing, the programmes used to create and share become even more mobile and exponentially increasing the pedagogical benefits.

This lowers barriers to entry, as infrastructure is typically provided by a third party and does not need to be purchased for one-time or infrequent intensive computing tasks. Pricing on a utility computing basis is fine-grained, with usage-based options and fewer IT skills are required for in-house implementation.

Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service. So students can easily access these computing services as authentic resources.

Today's IT professionals in educational institutions need to respond quickly to increasing demands from students and faculty, while coping with fixed or declining budgets and staff. In this challenging environment, cloud-based computing has become an increasingly attractive option for delivering education services more securely, reliably, and economically.

The benefits of cloud computing is being recognized in businesses and institutions across the board, with almost 90 percent of organizations currently using some kind of cloud-based application. The immediate benefits of cloud computing are obvious: cloud-based applications reduce infrastructure and IT costs, increase accessibility, enable collaboration, and allow organizations more flexibility in customizing their products both for their brand and for their audience.

Changes in Education using Cloud Computing:

- **Updated Learning Materials:** Cloud-based materials are easy to update in real time so that students always have access to the most current learning resources.

- **Less Expensive Materials**: The cost of textbooks has outpaced the cost of virtually everything else in education, including tuition. Cloud-based textbooks can solve this problem, as digital content is significantly less expensive than printed content.
- **Less Expensive Hardware:** Cloud-based applications can be run on Internet browsers, but most are compatible with mobile devices as well. Students also don't need to purchase external storage devices as there are plenty of companies, like Google, that offer free cloud-based storage.
- **Low Cost Software:** One of the biggest advantages of cloud-based computing is the software-as-a-service (SaaS) model. Many software programs are now available either free or on a low-cost subscription basis, which substantially lowers the cost of essential applications for students.
- **Beneficial to Diverse Students**: It opens up a world of new possibilities for students especially those who are not served well by traditional education systems. There are many types of students for whom a traditional school environment simply does not work, and these students now have many options for pursuing alternative forms of education.

Cloud Computing-Challenges

Cloud services are delivered via the Internet from high-specification data centres in locations remote from the end user and their institution. The server farms have features such as the latest cooling systems and service optimization techniques which individual educational institutions are unlikely to be able to afford. The data centres are often located near cheap sources of electricity. The user does not necessarily know their locations, though in some cases users require services to be located in specified countries due to data protection legislation.

Data from hundreds or thousands of companies can be stored on large cloud servers, hackers can theoretically gain control of huge stores of information through a single attack - a process called "hyperjacking".

Physical control of the computer equipment i.e private cloud is more secure than having the equipment off site and under someone else's control i.e., public cloud. This delivers great incentive to public cloud computing service providers to prioritize building and maintaining strong management of secure services. Some small businesses that don't have expertise in IT

security could find that it's more secure for them to use a public cloud.

According to the Cloud Security Alliance, the top three threats in the cloud are: Insecure Interfaces and API's, Data Loss and Leakage and Hardware Failure. Recently, another challenge facing by the technology is identity thief. This is when someone steals information and used it for his own benefit without permission. They either take it from sites that have somebody's personal information already or they hack into it. Identity thieves take information such as social security, credit card numbers, names and birthdays.

Conclusion

Cloud computing is the result of evolution and adoption of existing technologies and paradigms. The goal of cloud computing is to allow users to take benefit from all of these technologies, without the need for deep knowledge about or expertise with each one of them. The cloud aims to cut costs, and helps the users focus on their core business instead of being impeded by IT obstacles.

The time is not far that the device has no fixed memory and people are using fulltime internet access for backup their important data. Cloud computing is a tech friendly process in the field of education both for students and teachers. Cloud computing is not only reducing costs, but also creating an environment where all students can have access to high-quality education and resources.

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Training of Pre-service Elementary Teachers through Hands-on-Activities in Science

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Abstract

A set of innovative and creative hands-on activities in science were designed and developed by using Low-Cost, No-Cost and locally available material. For this experimental study pre-test and post-test design was planned. The experimental (N=39) and control groups (N=41) were drawn from among the pre-service teachers trainees of second year of Two year Diploma in Education course in DIETs of Delhi. A test with 35 items was developed on the content of some selected topics from the Class VI-VIII Science Text books published by NCERT, and administered as pre-test and post-test to the both the groups. The training sessions with trainees were organized to see the effectiveness of these activities in developing and enhancing conceptual understanding, reflective thinking and pedagogical skills of Elementary Teachers. The analysis of the responses of teachers in pre-test and post-test indicated that the Hands-On Activities were effective in enhancing the teaching skills of the teachers.

Keywords: *Pre-service Elementary teachers, Hands-on Activities, and Teaching Skills.*

Introduction

Training of The National Curriculum for Teacher Education, 2009 also envisaged an empowering and envisioning role of the training institutions such as DIETs, CTEs, IASEs and SCERTs. All out efforts are to be made to provide quality elementary education to all children without any obstruction. The onus to plan, organize and complete an effective training programme is on the teacher training institutions. A systemically designed of the training programme can help both categories of teachers in developing their repertoire.

A number of pedagogic practices and approaches are being attempted for improving the effectiveness of teachers' preparation all over the world. In addition to the use of ICT and Multimedia in training of teachers, Hands-on activities have their importance to promote amongst

the pupils, the constructivist way of learning. The importance and effectiveness of Hand-on activities is also advocated in the following proverb:

I hear and I forget, I see and I remember, I do and I understand

As indicated above the learning by doing had always been a powerful methodology for permanent learning and development of concepts and thoughts.

A plethora of literature is available on use of the Hands-on Activities in teaching and training of teachers. Piaget stressed the importance of learning by doing, especially in science. According to Piaget, "a sufficient experimental training was believed to have been provided as long as the student had been introduced to the results of past experiments or had been allowed to watch demonstration experiments conducted by his teacher, as though it were possible to sit in rows on a wharf and learn to swim merely by watching grown-up swimmers in the water. It is true that this form of instruction by lecture and demonstration has often been supplemented by laboratory work by the students, but the repetition of past experiments is still a long way from being the best way of exciting the spirit of invention, and even of training students in the necessity for checking for verification" (1986, p. 705).

David and Peter (1994) while arguing about the perspectives of Hands-on Science Teaching mentioned that; 'Teachers who embrace hands-on learning in science seem to recognize certain desirable outcomes and endorse student-centered instructional approaches.'

A number of studies have been mentioned by Brian J. Foley and Cameron McPhee (AERA 2008) in their research paper entitled, 'Students' Attitudes towards Science in Classes Using Hands-On or Textbook Based Curriculum'. They have mentioned researches by Kracjik et al, (1998); Lehrer, Schauble, Carpenter & Penner, (2000); White & Frederiksen, (1998); Young & Lee, (2005) in the area of Hands-on science. In addition, the work of Amaral, Garrison &

Klentschy, (2002) from El Centro Schools showing improvement in the district reading and writing Scores after the adoption of hands-on science curricula has been quoted. On the professional development of teachers a study by Vanosdall, Klentschy, Hedges & Weisbaum,

(2007) has been specifically mentioned. Driver *et. al.* (1994) have also made a study on constructing scientific knowledge in the Classroom.

A lot of literature authored by eminent science educationists has also been surveyed which includes Teaching Science in Elementary Schools by Ediger and Rao, (2003), The Art of Teaching Science by Grandy and Vaille (2006) which is based on their research work on innovative hands-on activities in science, Teaching Science: Developing as a Reflective Secondary Teacher-by Tony et.al., (2010) with an aim to help teachers to learn how to improve their classroom performance and Science and You & Science and Me by Lavakare & Narlikar (2004)- a useful resource material for the science teachers and students in creating interest in science and developing sense of appreciation of science and scientific processes.

In this paper we report the findings of our study conducted with the following objective:

"To study the effectiveness of Low-Cost, No-Cost and locally available material based Hands-on Activities in Science in enhancing conceptual understanding and pedagogical skills of Pre-service Elementary Teacher Trainees."

Hypotheses

There is no significant difference in the level of competence of Pre-service Elementary Level Teachers trained through Hands-on Activities and Lecture Method of Training

Organization of Hands-On Activities in Science with Pre-service Teacher Trainees (PTHA)

Training sessions were organized with an intact experimental group of pre-service Elementary Teacher Trainees by organizing Innovative Hands-on-Activities with the active participation of teachers. The participants were given opportunity to participate, to observe carefully and critically, and to draw conclusions. Probing questions were also posed while organizing the activities and problem-solving processes. They were motivated and guided to arrive at conclusions regarding some observations and experiences that are usually not clear from the content in the text books.

The Hands-on Activities for teaching-learning of 'Separation of Substances (Class VI); Air (Class VI); Water (Class VI); Acids, Bases and Salts (Class VII); Physical and Chemical Changes (Class VII);

Combustion and Flame (Class VIII); and Metals and Non-Metals (Class VIII)', were organized.

The sample consisted of TWO intact groups of Pre-service Elementary Teacher Trainees of DIET Delhi. The control and treatment groups consisted of 41 and 39 participants, respectively.

The control group was also oriented by the investigator on the same topics by the Lecture method by 'Chalk and Talk'.

Analysis of the Data of Pre-Service Teachers

The data collected from control as well experimental group of pre-service teacher trainees was analyzed by applying appropriate statistics and presented as below.

Table 1: Pre-Test Data of Control as well as Experimental Group1 (Treatment with Hands-on Activities) (PTLM vs PTHA)

Statistics	Control Group (N= 41) PTLM	Exp. Group (N = 39) PTHA
Mean	16.10	16.97
SD	3.46	3.74
SEM	0.54	0.60
df	78	
t	1.09	
SED	0.81	
P value (two tailed)	0.28	

PTLM: Pre-service Teachers taught trained through Lecture Method

PTHA: Pre-service Teachers taught trained through Hands-on Activities

The two-tailed P value equals 0.28 and by conventional criteria, this difference is considered to be not statistically significant.

The data in Table 1 above indicate that the mean score of both the group was nearly same. The p value indicates that the performance of the two groups is not statistically significant. The computed't' value is also non-significant at 0.05 level and 0.01 level. Thus the statistical analysis of the pre-test scores of control and experimental groups indicate that both the groups were at equivalent level in the beginning of treatment.

Table 2: Post-Test Data of Control as well as Experimental Group1 of Pre-Service Teachers (PTLM vs PTHA)

Statistics	Control Group (N= 41) PTLM	Exp. Group (N = 39) PTHA
Mean	18.80	23.15
SD	4.02	4.50
SEM	0.63	0.72
df	78	

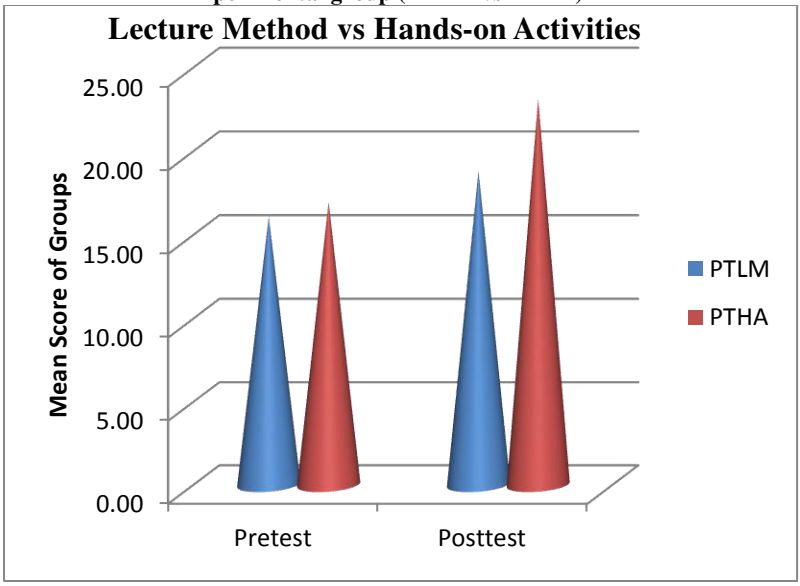
t	4.56
SED	0.95
P value (two tailed)	<.0001

The two-tailed P value is less than 0.0001and by conventional criteria this difference is considered to be extremely statistically significant. The mean of PTLM minus PTHA equals -4.35, which is a substantial difference.

The above data indicate that the mean score of the experimental group was higher than that of control group. The p value indicates that there that the performance of the two groups is extremely statistically significant. The computed *'t'* value is also significant even at 0.001 level which suggest the high effectiveness of the treatment through Hands-on activities over the Lecture method or 'chalk n talk'.

The graphical presentation of the mean scores of pre-test and post-test of control and experimental groups is given below, in Figure 1.

Figure 1: Graphical Presentation of mean Score of Control and Experimental group (PTLM vs PTHA)



As evident from the data, a larger difference in the mean scores of the control as well as experimental groups in the post-test and a higher *'t'* value (4.56) could be attributed to the impact of the treatment given to

the teachers. The data suggest that Hands-on Activities carried out in the training sessions by using low-cost, no-cost material and locally available material were found effective by the group. Thus it could be corroborated that Hands-on Activities (HOA) contributes to a greater extent in enhancing the pedagogical content knowledge, process skills and competence of the teachers.

On the basis of the above analysis and interpretation of the data, the Hypotheses 1 (H 1.: There is no significant difference in the level of competence of Pre-service Elementary Level Teachers trained through Hands-on Activities and Lecture Method of Training), is rejected.

Some of the Comments of the Trainees about the HOA are reproduced as under.

- The activities are very helpful which gives us plenty of knowledge. New concepts and clarity of concepts are formed by these types of activity. - *Trainee-1*
- The activities are really good and interesting Excellent Efforts. – *Trainee-2*
- The presentation of various concepts through activities was very good and interesting. These are helpful to create sensitization and eradicate superstitions. - *Trainee-3*

Some Visuals showing Organization of Activities

Conclusion

The analysis of data indicated that the activities were found effective by the participants which is evident from the significant difference in the pre-test and post-test scores of the prospective teachers forming the control and experimental groups, On the basis of the study and foregoing discussion it could be easily corroborated that Hands-on activities in science are effective in developing the pedagogical skills and competence of the prospective elementary teachers. The findings suggest that the training programmes of prospective teachers should provide them ample opportunity to learn development and use of Hands-on activities.

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Gender Disparities in Attitude towards Information Technology among Secondary School Teachers

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Introduction

Technological advances and their rapid integration in our life have prompted an increased interest in their potential role in educational systems. Use of technology is on the increase in India, but it seems rather unfortunate that the extent of its adoption, effective integration and utilisation for positive output in education is slow and are becoming issues of major concern to the education stakeholders in the nation. According to Lloyd and Albion (2005), an important factor behind the resistance of the teachers in infusing the information technologies to education despite the facilities available in their schools and classrooms is their negative attitude towards technology. The level of success in its integration in schools is not dependent on quality or sophistication of the technology, but rather on the teachers' support and attitude toward computers (Bitner & Bitner, 2002; Romano, 2003). Jencius and Paez (2003) suggested that understanding attitudes is important because attitudinal barriers can hinder the adoption of new technology. Past history has showed many promising technological innovations here failed to attain their promises due to the negligence of the end-users' attitudes and needs (McCarthy, 1998). Because of their critical role in the implementation process, educators' attitudes toward IT should be the focus of studies at the early stages of technology implementation. Unfortunately, however, the zealous entry of technology into the schools and the subsequent change demands has little considered teachers' attitudes (Harper, 1987). The result has often been obvious in teachers' passivity toward the new machines (Bush & Terry, 1997). Positive disposition towards computers is a prerequisite as well as a catalyst to acquiring a high level of computer literacy and successful pedagogical use of technology (Francis, Katz, & Jones, 2000). Selwyn (1997) argued that attitudes influence not only initial acceptance, but also future behaviours regarding computer

Attitude towards IT of teachers may be determined by several factors that influence their adoption in the education system. Literature demonstrates that some identified factors inhibiting teachers' positive disposition towards computers include computer experience (Garland & Noyes, 2004); locus of control (Rovai & Childress, 2003); age (Pope-Davis & Twing, 1991); and external factors (Norhayati, 2000). Apart from these factors researches also provide evidence for gender as one of the identified factors that might help in prediction of teachers' attitude towards technologies. Gender is of interest to the general populace especially now that females are gradually taking over and dominating the teaching profession at secondary levels of education. With the introduction of IT into education a new dimension of gender inequalities has been created. The orthodox and conventional gender disparities that existed in science related subjects are now being extrapolated into IT. Society views computers as highly technical and part of a male domain. Gefen and Straub (1997), Venkatesh and Morris (2000) and Wang and Wang (2010) investigated the effect of gender on technology acceptance and determined that gender significantly moderated the effects of perceived usefulness and perceived ease of use towards behavioural intention.

In the present context, there is a pressing need to contribute to a better understanding of the current status of male and female secondary school teachers' attitude towards information technology in the Indian scenario. The study also examines how gender differences may change based on various demographic factors such as marital status, training, location and medium of instruction.

Materials and Methods

Target population of the study comprised secondary school teachers from Aligarh city of Uttar Pradesh, India. A sample of 285 teachers including 145 (50.88%) males and 140 (49.12%) females working in 30 different secondary schools was drawn from the target population by purposive convenient sampling technique. The age of the participants ranged from 22 to 60 years. The participants had 1 to 38 years of teaching experience in schools.

The variable of attitude was determined by Likert based five-point (strongly disagree, disagree, no idea, agree, and strongly agree) self-rating Attitude towards Information Technology Scale (ATIT) developed by Nasrin and Islahi (2011). The questionnaire ATIT contained 30 items aimed to evaluate teachers' attitude toward

information technology in the areas of (i) significance in life, (ii) usefulness for students, (iii) productivity for teaching, and (iv) teacher's interest and acceptance. English as well as Hindi versions of the Scale were administered along with a covering letter explaining the purpose of the survey and detailed instructions to fill up the scale.

Each item was assigned a weightage ranging from 5 (strongly agree) to 1 (strongly disagree) for favourable items. In case of negative items the scoring was reversed. The range of scores is from 30 to 150 with the higher score indicating more positive attitude and vice versa. The raw scores were reorganized and subjected to appropriate statistical analysis using SPSS version 12.0. Cronbach's alpha of 0.894 was obtained for ATIT Scale.

Results

Overall attitude scores of male and female teachers were subjected to student's t-test (Table 1). Though male participants recorded slightly higher mean scores than females, there was no significant difference (p>0.05) between attitude of male and female teachers.

Table 1. Difference in Attitude of Male and Female Teachers

Gender	N	Mean	Std. Deviation	Std. Error Mean	df	t	Significance
Male	25	101.4800	22.70413	2.03072	243	1.438	Not Significant
Female	20	97.3583	22.13776	2.02089			

Attitude towards IT was measured in terms of (i) significance in life, (ii) usefulness for students, (iii) productivity for teaching, and (iv) teacher's interest and acceptance.

Table 2 presents the participants' mean scores. The overall computer attitude is well above the mid-point of the scale and indicates that participants hold somewhat positive attitude towards IT. The results, when analysed gender wise, showed that female teachers were more sceptical across all the domains than male teachers, however, the t values established that the obvious differences in the means were insignificant.

Table 2. Difference in Attitude of Male and Female Teachers with respect to Sub-Domains

S.No.	Factors	Overall mean	Male mean	Female mean	t	Significance
1	Significance in	3.34	3.42	3.25	1.549	Not

	life					Significant
2	Usefulness for students	3.38	3.45	3.31	1.188	Not Significant
3	Productivity for teaching	3.32	3.43	3.21	1.818	Not Significant
4	Interest and Acceptance	3.22	3.25	3.19	0.558	Not Significant

One-way ANOVA of the average attitude scores of male and female teachers with respect to their location (rural/urban) revealed that there were no significant differences ($F_{(3,241)} = 0.834$; $p>0.05$) in the attitude of the groups: rural male, urban male, rural female and urban female teachers.

Similarly, ANOVA of the attitude scores of male and female teachers with respect to their training (trained/untrained) revealed that the ATIT scores of different category teachers (untrained male, untrained female, trained male and trained female) were insignificantly different ($F_{(3,241)} = 0.794$; $p>0.05$) from each other.

Average attitude scores of male and female teachers with respect to their medium of instruction (Hindi/English) were found to be significantly ($p>0.05$) different (Table 3). Highest ATIT values were observed for English medium male teachers which was comparable ($p>0.05$) to those obtained for English medium female teachers. However, the attitude scores of both these groups were significantly ($p<0.05$) different from the other two groups viz., Hindi medium male teachers and Hindi medium female teachers. Moreover, the latter two groups were insignificantly ($p>0.05$) different from each other.

Table 3. Attitude of Teachers with respect to their Medium of Instruction

Factors	**N**	***Subset of Means for alpha = .05**	
		1	**2**
Hindi Medium Female	49	90.78	
Hindi Medium Male	42	91.17	
English Medium Female	71		101.90
English Medium Male	83		106.70

*Means in the same column are insignificantly different from each other.

One-way ANOVA of the average attitude scores of male and female teachers with respect to their marital status (married/unmarried) revealed that there were significant differences ($p<0.05$) in ATIT scores

of the four groups (Table 4). Lowest ATIT values observed for married female teachers were comparable (p>0.05) to those obtained for married male teachers but significantly (p<0.05) different from unmarried male and unmarried female teachers. Highest ATIT values observed for unmarried female teachers were comparable (p>0.05) to those obtained for unmarried male teachers.

Table 4. Effectiveness of Teachers with respect to their Marital Status

Factors	N	*Subset of Means for alpha = .05	
		1	2
Married Female	83	92.51	
Married Male	74	97.97	
Unmarried Male	51		106.57
Unmarried Female	37		108.24

*Means in the same column are insignificantly different from each other.

Discussion

No significant difference between attitude of male and female teachers was found. This finding is in contrast with the earlier studies wherein females were reported to have more negative views and perceptions towards the use of computers than males (Koohang, 1987; Dupagne, & Krendi, 1992; Kay, 1992). However, lack of differences in attitude towards IT between genders in this study is consistent with researches that report no differences in teacher attitudes on the basis of gender (Wong and Hanafi, 2007; Bardakci et al., 2010; Yusuf, 2011; Rajpoot and Rajpoot, 2011; Gujjar et al., 2013; Khan, 2013). The difference in the use of computers can be presumed to be basically because earlier males had greater exposure to computers both in formal instructional settings and informal settings. But with more and more technological resources becoming prevalent, this may have the effect of equalising difference between males and females. The contemporary male teachers may not have an edge over their female counterpart in their attitude to IT use. Kirkpatrick and Cuban (1998) noted that the gender gap was narrowed when both genders were exposed to the same amounts and types of experiences when using computers. This opinion is also supported by Koh, Chai and Tsai, (2010). The current trend of no significant differences in attitude levels based on gender, as opposed to the eighties and nineties may be attributed to equal interaction of

both the sexes with technology. Therefore it can be stated that whatever the differences arising from the new technology related attitude and usage conditions are caused by the social gender roles and the early chance of men to have more experience in these technologies rather than by the inherent gender characteristics.

When different demographic factors were taken into consideration, similar outcome was observed for geographical location (rural and urban) and training (B.Ed. / Non B.Ed.) with IT attitudes. This finding is in agreement with the finding of Khan (2013) that no significant difference was found on the basis of location. This could be attributed to the same reason of wide availability and accessibility of technological resources and experience with it that has lead teachers to gain competence and confidence in using IT resources and developing a positive attitude irrespective of the factors. This is in line with the old theory of Zajonc (1968) that the more a person is exposed to an object or a person, the more he or she responds positively to that object or person. Hence, the teachers from rural area and untrained teachers have analogous attitudes towards IT as teachers of urban area and trained teachers.

However attitude towards IT was found to be significantly influenced by medium of instruction and marital status but still they could not influence the attitude to the extent to produce gender specific differences which suggests that irrespective of their gender teachers of English medium schools had a significantly more positive attitude towards IT than teachers of Hindi medium schools. This may be due to the fact that technological resources and softwares in "Hindi" may not be easily accessible so Hindi medium school teachers are not as positive in their attitude as English medium school teaches. However, this trend is in contrast with previous studies (Sharma, 2013; Khan, 2013) that reported no significant differences.

Similarly, unmarried teachers irrespective of their gender had a more positive outlook towards IT than married ones. On the contrary Rajpoot & Rajpoot (2011) reported no significant differences between the married and unmarried teachers. The result of this study may be explained by assuming that married teachers were older than unmarried teachers, the average age of unmarried teachers being (32.88) and that of married teachers being (42.20) years. Since technology uptake has been more among the younger generation so the attitude of unmarried teachers were more positive than married teachers. In this context

Jennings and Onwuegbuzie (2001) observed that younger teaching staff was found to have more positive attitudes towards the use of ICT. Similarly, Hernes et al., (2000) concluded that the teaching staff that showed a good command of the use of the Internet are negatively correlated with age. Moreover, the result may also be accredited to the work-family conflict where an individual after marriage has to balance their duties at home and at work dividing their time and energy between the two. The conflict resulting because of simultaneous pressures from work and family roles seem to be mutually incompatible. Such conflicting demand is likely to threaten the peace of mind, quality of work and eventually leaves little time for them to go for technological innovation and have a positive attitude towards it.

Conclusion

According to Bandura (1999), the socio cognitive theory recognizes the influence of environment and observational learning on human adaptation and change. Assuming gender as an important predictor of abilities, skills and interests of an individual is erroneous. Such ways of categorizing gender often lead to gender hierarchies and injustices for whole groups as well as individuals (Connell, 2002). While there may be broad gender trends, these are trends only; they should not be interpreted as generalised rules. Any differences exhibited should be regarded as some cultural, societal or situational influences and experiences of the genders which should be further investigated and used to improve professional service. It seems clear that in future effective use of technology in classrooms would be expected from all teachers irrespective of their gender.

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Visual Literacy: Its Role in Teaching Learning Process

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Abstract

Children are surrounded by all sorts of visual media now and according to Mary Alice White, researcher at Columbia Teachers' College:' Young people learn more than half of what they know from visual information, but few schools have an explicit curriculum to show students how to think critically about visual data.' This paper briefly discusses the history of visual literacy and its significance for class room teaching and techniques for developing visual literacy among the learners

The term "Visual Literacy" was first coined in 1969 by John Debes, one of the most important figures in the history of IVLA.(International Visual Literacy Association) Debes' offered (1969b, 27) the following definition of the term: "Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication." There are many more definitions of the term. In fact, each visual literacist has produced his/her own definition! The coexistence of so many disciplines that lie at the foundation of the concept of Visual Literacy, emphasize the eclectic nature of it, which is the major obstacle towards a unanimously agreed definition of the term.

Wileman (1993) defines visual literacy as "the ability to 'read,' interpret and understand information presented in pictorial or graphic images" (p. 114). Associated with visual literacy is visual thinking, described as "the ability to turn information of all types into pictures,

graphics, or forms that help communicate the information" (Wileman, p. 114). A similar definition for Visual literacy is "the learned ability to interpret visual messages accurately and to create such messages" (Heinich, Molenda, Russell, & Smaldino, 1999, p. 64).) For example, when traveling; we see various signs on the road; a visually literate traveler can derive meaning from these signs/symbols.

Only after the printing press was invented illustrations and type were separated, with illustrations often falling by the wayside, recent history shows a reversal in this separation with greater reliance on visually oriented approaches for the presentation of information. Academics have a long history of claiming and defending the superiority of verbal over visual for representing knowledge. By dismissing imagery as mere decoration, they have upheld the sanctity of print for academic discourse. However, in the last decade, digital technologies have broken down the barriers between words and pictures, and many of these same academics are now willing to acknowledge that blending text with image helps in constructing meaning, and some may even go so far as to admit that images are communication devices and can stand on their own. The results are leading to a visualization movement in modern computing whereby complex computations are presented graphically, allowing for deeper understanding of concepts and data. Leonardo da Vinci, in recognizing the impossibility of recording volumes of data, translated words into drawings.

According to the poet Simonides, "Words are the images of things" (as cited in Benson, p. 141); Similarly, Aristotle stated that, "without image, thinking is impossible" (as Cited in Benson, p. 141). Characters in alphabets began as pictures with meaning (West, 1997).The use of visual literacy ideas and strategies to enhance verbal learning is important (Flattley, 1998; Sinatra, 1986). Because visual literacy precedes verbal literacy in human development, Berger (1972) explains, "Seeing comes before words. The child looks and recognizes before it can speak" (p. 7). The Dale Cone of Experience model is based on the concept that learning evolves from concrete to abstract. Visual symbols are nonverbal representations, preceding verbal symbols (Sinatra, 1986). Pictures or illustrations are analogs of experience and are only one step removed from actual events, these visual representations capture and communicate concrete experience in various ways. "A good picture is equivalent to a good deed" (Van Gogh, as cited in http://quoteworld.eilc.org/search.cgi*).* . One picture is

worth a thousand words? When a visual aid supports a verbal message, a speaker has added dramatic impact to his or her presentation. Visuals can be a valuable tool in both getting a point across and adding interest to a presentation. As history repeats itself, we may find that a great deal of information is better presented visually rather than verbally. The burgeoning use of pictorial representation has implications for science and technology education. The capacities to both understand and generate technical pictures are fundamental to scientific and technological literacy for students at many levels, from school to university. We could describe these capacities as a form of visual literacy that involve reading and writing of technical pictures. It is just as important for students to develop this visual aspect of scientific and technological literacy as it is for them to develop the general literacy.

As more visual elements are incorporated to achieve an optimal balance between verbal and visual cues in education, Kellner (1998) Proposes multiple literacy's which he thinks is necessary to meet the challenges of today's society literacy's that include print literacy, visual literacy, aural literacy, media literacy, computer literacy, cultural literacy, social literacy, and eco-literacy. To interpret the pictures properly, the viewer must know about these conventions and be skilled in decoding them in an appropriate manner. If visual literacy is regarded as a language, then there is a need to know how to communicate using this language, which includes being alert to visual messages and critically reading them. Visual literacy, like Language literacy, is culturally specific although there are universal symbols or visual images that are globally understood. The statement that visual literacy is a learned skill, not an intuitive one is supported by many different researchers' studies. In "Visual "Literacy": Image, Minds, and Reality", Messaris concludes that visual literacy ``does not come naturally to most people [and]... appear[s] to rest on exceptional experience or on explicit training". (Messaris, 1996) visual literacy should be seen as a slow developing set of skills and understandings and it progress unevenly, each step building on earlier ones, each dependent on certain kinds of exposure and instruction (Yenawine, 1997). For developing Visual Literacy teachers must develop among students' capacities to under-stand and properly interpret specialized technical visuals. Teaching of the necessary knowledge and skills should begin when children are quite young, even before they begin formal studies of science and technology

Kellner (1998) Proposes multiple literacy's which he thinks is necessary to meet the challenges of today's society literacy's that include print literacy, visual literacy, aural literacy, media literacy, computer literacy, cultural literacy, social literacy, and eco-literacy Visual images are fast becoming the most predominant form of communication. Two major approaches have been suggested for developing visual literacy skills (HeinichEt al. 1999). First is to help learners read or decode visuals through practicing analysis techniques. Decoding involves interpreting and creating meaning from visual stimuli. The Second is to help learners write or encode visuals as a tool for communication. Students develop Visual abilities through use. Science learning materials rely heavily on visuals to communicate important information to students trying to understand complicated ideas and solve difficult problems. Line drawings, diagrams and photographs can elaborate, clarify, and make memorable the text that they accompany. Such visuals are called iconic because the spatial relations depicted in these two-dimensional visuals represent many of the actual spatial realities of concrete three dimensional things, for example, a physical object's position, orientation, shape, and size. A second useful type of illustration is called schematic. Schematic visuals function as summarizers of information, whereby essential concepts are presented in a quickly read formal. For example, diagrams can be a powerful tool for summarizing the relationships between photosynthesis and respiration. These two related concepts contain numerous difficult-to-learn biochemical cycles--information that students must disentangle, segregate, group and compare. Research and classroom experience suggest that students who learn such cycles from diagrams rather than from prose do better on some school tests. (Benson, 1997; Branton, 1999; Dwyer, (1999)

Visual Literacy across the Curriculum

Several 21st century scholars, including Courtney Cazden, Allan Luke, and others advocate for the importance of both linguistic and visual literacies for comprehension. Implications, then, for classroom would be to incorporate the written word with visual information to provide a rich teaching and learning environment. For example, one might give kids a picture and asking them to write a caption. Many scientific concepts are more clearly grasped when visualized as a visual text, such as a cross section (for example to explain how we breathe) or flow chart (to show an animal's life cycle).Relationships in nature can also

be summarized as a web diagram (such as a food web) or flow chart (such as the water cycle).Step-by-step procedures ("how to...") can be followed more easily when arranged as a flow chart, storyboard, or timeline. In Social studies Social relationships can be understood quickly through web diagram (sometimes called a Sociogram) or a tree diagram. Flow charts are useful in explaining topics such as recycling, habitats, interdependence and responsibilities. For History timelines are used to summarize sequences of events, Flow maps (maps with arrows showing journeys) help children to visualize exploration and migration themes, Changes over time, causes of key events, and sequencing of events can be shown clearly using flow charts, Line graphs help visualize economic and other changes over time . In Geography graphs (line, bar, and pie) help students to grasp concepts such as climate, population change, and public opinion, Flow charts help visualize topics such as the water cycle, climate change, globalization, and Earth processes, Maps can be used to visualize political states, climate, vegetation, wealth and poverty, trade, war, and so on. In Mathematics Young children can benefit from visualizing operations on addition, subtraction, multiplication , division, fractions, decimals etc Spatial concepts are best shown in maps and diagrams., Some children can interpret problems more successfully if they are encouraged to visualize the key elements in a map or diagram., Graphing assists work in measurement and recording of data. In terms of learning tools, one visual tool used in teaching environment is PowerPoint, intended to present information visually. One expert on visual literacy, Edward Tufte, a Yale professor and an expert on the presentation of information graphics, offers us a challenge: Do the slides communicate? His interest focuses on the efficacy of the tool rather than simply the happy opportunity to have the tool. Thus, visual literacy not only refers to learning through the visual experience but learning useful, helpful, and usable information! It is easier for a student to make meaning when not only information is provided but information that a child can use to make meaning of her or his world.

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Pedagogy in Civil Engineering Education

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Abstract

One major aspect of Civil Engineering education is the presentation of the behaviors of physical systems or models of systems. This paper deals with the major changes occurring in teaching of civil engineering attributes for students to succeed in the field and institutions. The old and newly emerging approaches to civil engineering education are described herein. Literature survey reveals that the changing approaches are improving retention of knowledge, producing better analytical skills and creating awareness of the soft skills advantages to the civil engineering profession. The new approaches are found fast and more effective in transferring the knowledge to the civil engineering students.

***Keywords**: Civil, Engineering, Teaching, Visual, Online*

Introduction

One major aspect of Civil Engineering education is the presentation of the behaviors of physical systems or models of systems. The principles of these systems are repeatedly demonstrated through a wide variety of problem applications. Learning is enhanced through modern techniques. Pedagogical aids provide a help to the teacher in producing new problems for practice, home assignments, and examination tests. The various components which comprise the pedagogical aid, its use, and the computer environment in which it is used are described herein. Students access the pedagogical aid through personal computers with a high resolution graphics display and graphical input devices. Newell et.al.,(1983) This computing environment provides new opportunities in the area of computer based civil engineering education.

Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals,

dams, barrages, bridges and buildings (History and Heritage of Civil Engineering. ASCE. Retrieved 8 August, 2007).

Civil engineering is the second-oldest engineering discipline after military engineering, and it defined to distinguish non-military engineering from military engineering (Canadian Society for Civil Engineering, 2007). Is traditionally divided into several sub-disciplines including architectural engineering, environment engineering, geotechnical engineering, structural engineering, earthquake engineering, materials engineering, wastewater engineering, offshore engineering, quantity surveying, coastal engineering, surveying and construction engineering (Encyclopedia Britannica 2007). Civil Engineering takes place in the public sector from municipal and development authorities through to state and national governments and in the private sector from individual homeowners to national and international companies. In this paper the new learning aids are described which are currently used in civil engineering education. The use of visualization techniques, videos and animations are highlighted which are very effective in current scenario.

History of Civil Engineering Profession

Engineering has been an aspect of life since the beginnings of human existence. The earliest practice of civil engineering may have commenced between 4000 and 2000 BC in Ancient Egypt, the Indus Valley Civilization, and Mesopotamia (Ancient Iraq) when humans started to abandon nomadic existence, creating a need for the construction of shelter. During this time, transportation became increasingly important leading to the development of the wheel and sailing. and the stupas constructed in ancient Sri Lanka

Until modern times there was no clear distinction between civil engineering and architecture, and the term engineer and architect were mainly geographical variations referring to the same occupation, and often used interchangeably. The construction of pyramids in Egypt (circa 2700–2500 BC) were some of the first instances of large structure constructions. Other ancient historic civil engineering constructions include the Qanat water management system (the oldest is older than 3000 years and longer than 71 km, the Great Wall of China by General Meng T'ien under orders from Ch'in Emperor Shih Huang Ti (c.i, 220 BC). The Romans developed civil structures throughout their empire, including especially aqueducts, insulae, harbors, bridges, dams and roads. In 1818 the Institution of Civil

Engineers was founded in London. The Mughal dynasty was established after the victory of Babur at Panipat in 1526. During his five-year reign, Babur took considerable interest in erecting buildings. His grandson Akbar built widely, and the style developed vigorously during his reign. Among his accomplishments were Humayun's Tomb (for his father), Agra Fort, the fort-city of Fatehpur Sikri, and the Buland Darwaza. Akbar's son Jahangir commissioned the Shalimar Gardens in Kashmir. Mughal architecture reached its zenith during the reign of Shah Jahan, who constructed the Jama Masjid, the Red Fort, the Shalimar Gardens in Lahore, and the most famous Mughal monument, the Taj Mahal, as well as many other fine examples of the style. While Shah Jahan's son Aurangzeb commissioned buildings such as the Badshahi Masjid in Lahore. Jamuna canal was constructed during the reign of Firoz Shah. Gardens, palaces, and sarais in the delhi area were served by smaller canals.

History of Civil Engineering Education

Modern cult of technical/civil engineering education began in India with the establishment of "Survey School" at Madras (Now Chennai) by the English traders in 1794. Besides assisting the British surveyors, the School provided training to Indian personal in modern land survey(3.) Later on, technical education spread to other parts of the country and was transferred from generation to generation.

Civil engineering is the application of physical and scientific principles for solving the problems of society, and its history is intricately linked to advances in understanding of physics and mathematics throughout history. Because civil engineering is a wide ranging profession, including several separate specialized sub-disciplines, its history is linked to knowledge of structures, materials science, geography, geology, soils, hydrology, environment, mechanics and other fields.

During the years 1902 and 1921**,** Indian Education Policy (1902) advocated a speedy growth of technical education2. During this period, the government of India did not pay any attention towards technical and professional education. However, the recommendations of Indian Education Commission were accepted and technical and vocational subjects were included in the curricula of high schools in different provinces3.

On 30th November, 1945, the All India Council for Technical Education (AICTE) was set up by a resolution of the Government of

India on the recommendation made by Central Advisory Board of Education (CABE). The government of India appointed a commission in November, 1948 under the chairmanship of Dr. S. Radhakrishnan, In 1964, Education Commission popularly known as Kothari Commission was appointed under the chairmanship of Prof. D.S. Kothari. The first engineering college was established in the Uttar Pradesh in 1847 for the training of Civil Engineers at Roorkee, Thomason College (which later become IIT Roorkee) which made use of the large workshops and public buildings there that were erected for the Upper Ganges Canal.

Education and Licensure

Civil engineers typically possess an academic degree in civil engineering. The length of study is three to five years, and the completed degree is designated as a bachelor of engineering, or a bachelor of science. The curriculum generally includes classes in physics, mathematics, project management, design and specific topics in civil engineering. After taking basic courses in most sub-disciplines of civil engineering, they move onto specialize in one or more sub-disciplines at advanced levels. While an undergraduate degree (BEng/BSc) normally provides successful students with industry-accredited qualification, some academic institutions offer post-graduate degrees (MEng/MSc), which allow students to further specialize in their particular area of interest.

In general, civil engineering is concerned with the overall interface of human created fixed projects with the greater world. General civil engineers work closely with surveyors and specialized civil engineers to design buildings, drainage, pavement, water supply, sewer system, dams,. General civil engineering is also referred to as site engineering, a branch of civil engineering that primarily focuses on converting a piece of land from one usage to another. Site engineers spend time visiting project sites, meeting with stakeholders, and preparing construction plans. Civil engineers apply the principles of geotechnical engineering, structural engineering, environmental engineering, transportation engineering and construction engineering to residential, commercial, industrial and public works projects of all sizes and levels of construction.

Teaching with Visualizations

Visualization cannot be achieved in a textbook and a traditional lecturing environment. This task can be accomplished using computer

Software, in which a new method of teaching, named 'learning with visualizations' is designed to assist students in deeply understanding and effectively mastering subjects. In civil engineering, students learning about analysis and design typically experience such complex aspects that they usually require additional illustrative animations, simulations, or further explanations with visualizations. For example, when learning construction technology, students need to visualize materials and sequences of construction process, i.e., how all components of a facility are assembled at the construction site. Indeed, visual simulations or visualizations cannot be achieved using just a textbook and a traditional lecturing environment. The need to integrate advanced education technology tools such as interactive simulations and visualizations into the curriculum. It has been recognized by accrediting bodies that these tools enhance student learning and improve quality of engineering education (Atkins, et al., 2003; Bouchlaghem & Beacham, 2000; Messner & Horman, 2003). In effect, studies on the benefits of technology-based education demonstrate that interactive multimedia units provide motivation, increase learning rate, contribute to retention, and even help effectively manage large classes while supporting the teacher as facilitator (Atkins, et al., 2003; Iskander, 2002; Kurtis, 2003).

Use of Visual Simulations in Civil Engineering Education:

Visual engineering education has gained progress in recent years. Visual simulation gives realistic picture of the phenomena involved in the behaviour of structures under the action of loads. For example, the failure of a bridge constructed across a river can be visualised in computer aided laboratory on a computer using a visual simulation computer software.

When teachers incorporate visual simulations of real-life scenarios into their classroom activities, students participate more and have a more satisfying learning experience (Duran, et al., 2007). Visual simulations are particularly effective at deepening understanding of subjects (Iskander, 2002). Likewise, 3-D animation and walkthrough computer models demonstrate construction processes. it is felt that today's students are more attuned to computer and video technologies and are likely to learn better if they are provided with computer-based modules (Kurtis, 2003).

The assessment of an engineering course with respect to student expectations or learning objectives is a necessary activity for enhancing the course quality. The assessment methods such as homework, quizzes, tests, exams, lab reports, oral presentations, and projects can be used as evidences of the overall student performance with respect to the learning objectives of the course where the proposed visualization-based teaching is implemented. In addition to the student works used as the assessment methods, a survey questionnaire can be used to assess the effectiveness of the visual teaching.

In old system, engineering education was based on application of technique, laboratory problems concerning practical problems in mind However, later it was felt taht the students should be taught the underlying physics in technique. as a result focus became more on theoretical aspect of science courses. Enhanced teaching method can help teachers to create new and more powerful form of teaching. However, it does not mean the teacher is poor in teaching, but rather than method of teaching may not be the best to engage the students in the learning process.

Smart Class Rooms

Recently the class rooms are differentiated as simple class rooms and smart class rooms. A well furnished big size room equipped with air conditioners, a personal computer, an LCD projector and a mike system is designated as smart class room. The lectures are given by power point presentation. As the number of students is more, the presentation is done by mike. The smart class room is similar to a conference hall. In addition to this, a white screen and marker are also provided for writing/drawing the sketches. particularly in the eventuality of power failure.

Traditional method of teaching (Chalk and black board system) becomes difficult specially when complicated drawings are involved in teaching. In a period of I hour, even drawing of the object may not be completed. In these circumstances, drawings can be displayed in the power point to save the time for discussion on the subject of drawing.

The field phenomena involved in civil engineering cannot be explained properly by expression alone in the class room. For example, the behaviour of flow of water over the hydraulic structures like dams, barrages, canal falls, water flow regulators etc. can be explained with their videos showing actual flow behavior. The erosion of sediment in channels can be shown in videos to understand the flow mechanism.

Better learning of real occurrence of cyclone, floods, tsunami waves generating in the ocean, the structural failures of building, bridges etc. during earthquake is possible by videos. It can be concluded that sitting in the class room, the students can experience the gravity of field problems, otherwise, which could be possible only by taking the students at the site, which is impossible in some situations like flood. The modern technologies like remote sensing can be explained by showing the imageries (map obtained using remote sensing technique).

Use of Application Software in Civil Engineering

In the past decades, the calculations were made by slide rules. Later, simple calculators were developed for calculations. Using these computing aids, the process of calculation was extremely slow. Micro computers were then developed for computations. It was an improvement over the old computing devices. The development of fast computing computers has now taken place using which the large calculations are possible in very short time. The availability of computer softwares has made the task rather simple and fast. The softwares are built in computer programmes which can be run using the manuals., MIKE-11, Fluent, HEC-RAS, MATLAB are few examples of softwares available. Civil engineering aspects like weather forecasting and flood forecasting, is done on the basis of the softwares.

Online Computer Based Education Systems

Most recently, online system of education has gained momentum. Without going to the class room, the courses are running online. In this system the learning material (class notes, tutorials etc.) are sent to the students by e-mail. The lectures are arranged by video conferencing on Skype on computer systems. After certain duration of course taught online, tests/exams are conducted on line. The students sit on personal computer. A password is allotted to each student. The students operate the computer using the password and user name. The question paper is displayed on computer screen. The student solves the question paper on computer. Certain time is allocated for the completion of the exam. As this time passes, the connectivity of the students with the computer is disconnected automatically. This system of learning has more advantage than the disadvantage. At present in most of the institutions/organisations, the entrance examination for admission to a course or a competition for jobs has become online. This system has saved time and money in completing the application process.

Conclusions

Following conclusions are drawn from this study:

Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, barrages, bridges and buildings. Civil engineering is the application of physical and scientific principles for solving the problems of society. General civil engineering is also referred to as site engineering, a branch of civil engineering

Visualization cannot be achieved in a textbook and a traditional lecturing environment. This task can be accomplished using computer Software, in which a new method of teaching, named 'learning with visualizations' Visual engineering education has gained progress in recent years. Visual simulation gives realistic picture of the phenomena involved in the behaviour of structures under the action of loads

Students are more attuned to computer and video technologies and are likely to learn better if they are provided with computer-based learning process. Recently the class rooms are differentiated as simple class rooms and smart class rooms Traditional method of teaching (Chalk and black board system) becomes difficult specially when complicated drawings are involved in teaching. Video mode education is very effective as sitting in the class room, the students can experience the gravity of field problems Use of softwares has made the transference of knowledge very fast. Online system of education has made the learning of courses in civil engineering very easy and fast.

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E-Learning through Software Applications in the Design Studio

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Abstract

This paper discusses the possibilities that open up due to e-learning in the design studio with the inclusion of digital and web based applications in the design studio based pedagogy. Digital tools have lately evolved as an integral component in the design studios

Keywords**:** *Architecture Pedagogy, E-Learning, Architecture Education, Digital Design Studio, Virtual Design Studio*

Background

Educational software is essential in any learning environment to maximize the efficiency of the teaching learning process. Architecture is a discipline where all professional and pedagogical practices are directly related and influenced by the technological advancements whether these developments are in construction technologies or software based advancements.

Different theoretical orientations to teaching and learning have shaped the development of a spectrum of educational software packages (Stoddart & Niederhauser, 1993). Use of software applications like CAD and later BIM has been present in the Architecture profession and its teaching since 1980s. Lately the evolution from digital to internet based technologies has resulted in new experiments involving blended learning by incorporating a combination of manual, digital and internet based technologies in various proportions.

While use of CAD and BIM based applications have been researched in the profession as well as academics, this paper deals with potential sources which are being or can be incorporated in the design studio with the inclusion of web in educational and professional software applications.

Evolution of Design based Technologies

Initially architectural practices were carried out manually from scratch i.e. from conceptual development to final design proposal presentations. But in present scenario architectural practices involve a large number of technological advancement to deliver a design proposal. Technological developments are changing how buildings are designed.

Figure 1: Evolution of Design tools

The architectural profession has evolved to advanced tools that allow multiple designers to work on a central building model that contains key data to help teams design and construct a higher quality and more cost effective building, computer programs that use algorithms to link geometry with data to address specific problems which provides opportunities to design higher quality buildings and optimize efficiency and creativity.

Evolution of Design Studios

Since inception of the design studio in *École des Beaux Arts in 1863* and further innovation in Bauhaus advocating innovation and newness through experiments in the fusion of technology and culture, it has undergone numerous transformations. Several versions of a Design studio exist today. Design studios have therefore been the experimental ground for many new ideas and innovations that have shaped the course of design based pedagogy. As such, design studios as case studies for educational research are an accepted form of scholarly inquiry(Armstrong, 1999). While design studios globally reflect a common work culture and language where words like Desk crits, pin-up reviews, criticism etc. are a commonly acceptable and advocated feature, they have evolved basically into four distinct typologies in the contemporary times on the basis of use of technology, namely:

a) **Traditional Design Studio:** which is being used since the birth of the Architectural studio inEcole in France and still provides an effective environment for creating and understanding design by manually doing it on drawing sheet.

b) **Digital Design Studio (Paperless Design Studio):** which has evolved lately in the 80s and showcased Architecture which evolved due to exploration of digital computation in design

c) **Digital cum Manual Design Studio:** where design is performed partly digitally and partly manually and both parts are synthesized to obtain the final product, such as digitally rendering a handmade sketch at the concept design phase, or combining digital building rendering with handmade environment to create a matte painting of a 3d-view.

d) **Virtual Design Studio (VDS):** It is a term used to denote virtual classrooms for teaching design through sharing and collaboration. First VDS was initiated in 1992 entitled 'Distanced Collaboration' by the University of British Columbia and Harvard University. It extends the boundaries of the design studio to have a global outreach and accommodate students, teachers, stakeholders and people involved in participatory process etc. in one design studio. This has also resulted in new dimensions such as collaborative design studio. VDS can be further classified as closed and open studios. A few renowned examples include OIKODOMOS Virtual Campus of European schools of architecture and urban planning, Design Studio 2.0developed by Pak &Verbeke, Experiments in Motion (EiM) a collaborative project between Columbia GSAPP students and Audi Urban Future Initiative, Social Network Virtual Design Studio (SNVDS) developed by Marc and Jeremy.

Digital Technology in Design Studio based Pedagogy

Various studios provide varying degree of possibilities for learning and are therefore suited to various conditions of teaching learning environment. With the inclusion of internet based tools in the design studio the possibility of sharing and communication expands manifold which results in a collaborative learning environment.

Table 1: Blended technologies for Collaborative Learning in Design Studios

S. No	Type of Design Studio	Resources Required	Learning Possibilities		
			One to one	One to many	Many to many
1	Traditional design studio	Drafting tools and aids	✓		
2	Digital design Studio	Digital lab	✓	✓	

3	Digital cum manual design studio	Traditional studio with Digital lab	✓	✓	
4	Virtual design studio	Internet enabled digital design studio, applications for synchronous and asynchronous modes	✓	✓	✓

With major leaps in technology which is still continuing, digital design studios have undergone major transformations in their infrastructure and the way they are used but a well-organized pedagogy of teaching through software is not being defined or framed. Thus for architectural educators, a challenge of teaching digital design is maintaining a relevant curriculum amidst an increasing array of constantly evolving software and tools (Senske, 2011). Present knowledge of these technologies can be classified as follows:

- Concept based
- CAD based
- BIM based
- Energy Simulation
- Object oriented programming

With the integration of these technologies with the Internet Cloud and further mobile based applications, they pose new opportunities of sharing, collaboration and team work making management of work more effective. These new collaborative properties may define a new dimension in the design studio based pedagogy where work is shared and performed across the globe with the help of different teams of students, teachers etc. at different locations. As such, collaborative work which was performed through specially designed softwares can now be performed through a globally accepted CAD or BIM technology having a wider reach and making data sharing and work easy.

Table 2: Softwares and web based utilities available for design

Digital tools	**Softwares**	**Software Utility in Learning**	**Web based Utility**
Conceptual	Google Sketch up	Conception Visualization Drawing	
CAD	AutoCAD	Drawing	AutoCAD 360

		Visualization Animation	
BIM	Autodesk Revit	Visualization Drawing Simulation Construction Fabrication Decision making Management	BIM 360™ Field
Energy simulation	Equest	Light, Heat, ventilation based Simulation	Weather files
Architectural Computation	Rhinoceros with Grasshopper	Computation based modelling Simulation	
Mapping		Geographical mapping	Google Earth Google Maps

Conclusion

CAD & BIM has certainly revolutionized the approach to design in practice and academia. This change is further set to happen with the web based tools evolving in design and its pedagogy.Thus these new methods of collaboration and social media technologies need to be exploited to blend learning environments for greater reach and efficiency.

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Personality Profiles of Children of Working and Non-Working Mothers – A Comparative Study

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Abstract

The present study explored the difference between children of working and non-working mothers on personality profiles. A sample of 800 students of working and non-working mothers (400 children of working mothers and 400 children of non-working mothers) were randomly selected from the elementary schools of two districts Srinagar and Shopian of Kashmir valley. The sample subjects comprised 8th class students within an age range of 13 -14 years.Catell's high school personality questionnaire (HSPQ) was used to measure the personality profiles of children of working and non-working mothers. The data were analyzed by using mean, S.D. and t-value. The result indicated that children of working mothers were found as out-going, emotionally less stable, over-active, assertive, happy go-lucky, have low superego strength, adventurous, tough minded, internally restrained, insecure, self-sufficient, un-controlled, tense and reverse is true for children of non-working mothers.

Keywords: *Personality profile, Children, Mothers, Working and Non-working*

Introduction

Adolescence is regarded as the most important stage of life, in which many psychological changes occur. It needs intensive care and guidance from the part of parents, especially mothers. Maternal employment puts psychological effect on mothers, who find it difficult to engage supportive interaction with children. It is generally assumed that working mothers are unable to provide full time child care to their children. Besides taking care of the daily needs, working mothers have to perform the job and spend their most of the time as employees of any institute or company. These mothers are required to play a dual role, one as mother and housewife and other as an employee. This dual role

of working mother diverts their attention from the children which in turn may affect the personality profiles of these children.

The researchers like Sharma(2013),laxmi (2007), Andrabi (1997), Mittel (1997), Grossburg (1992), Smith (1981), Moore (1975), Miller (1975), Nelson(1971), Hoffman (1963), Roy (1963), studied the self-concept, social adjustment, academic achievement, scholastic achievement, achievement motivation, stress, personality adjustment, aggression, socialization, social maturity, cognitive development, emotional adjustment etc. of children of working and non-working mothers. Therefore, these studies highlight the **research gap** in the area of children of working and non-working mothers and signify the need to study the personality profiles of children of working and non-working mothers. Very few studies have been conducted on personality profiles of children of working and non-working mothers till date and no study has been conducted in this regard in Kashmir. Thus, it is hoped that this study may contribute to the literature on personality patterns of children of working and non-working mothers.

As personality of children of working and non-working mothers is one of the most important variables that needs to be investigated intensively and purposefully and hence it acted as a great motivating force to the investigators to conduct research in this area.

Objectives

- To identify the children of working and non-working mothers.
- To study the personality profiles of children of working and non-working mothers.

Hypothesis

- There is significant difference in personality profiles of children of working and non-working mothers.

Operational Definitions of the Terms Used

Personality Profiles:

The personality profiles in the present study referred to scores obtained by the sample subjects on High School Personality Questionnaire (HSPQ), of Cattell (1969).

Working Women: Working women in the present study referred to educated women with educational qualification as graduation and above and are engaged in any government or private salaried job.

Non-Working Women: Non-working women in the present study referred to educated women with educational qualification as graduation and above, but are not engaged in any government, semi-government or private job.

Plan and Procedure

The sample for the present study comprised 800 children of working and non-working mothers, in which 400 were children of working mothers and 400 were children of non-working mothers. They were randomly selected from the elementary schools of two districts Srinagar and Shopian of Kashmir valley. The sample subjects comprised 8th class students within an age range of 13 -14 years. Cattell's high school personality questionnaire (HSPQ) was administered to all the 800 sample subjects, after building rapport with the subjects and the concerned teachers and headmasters of respective schools. High school personality questionnaire (HSPQ) of Cattell was used to measure the personality profiles of children of working and non- working mothers. It consists of fourteen factors.

Analysis of Data

The test was administered as per the instructions provided in the test manual. The collected data was analyzed through statistical techniques viz, mean, S.D and t- test. The analysis is given in table I.

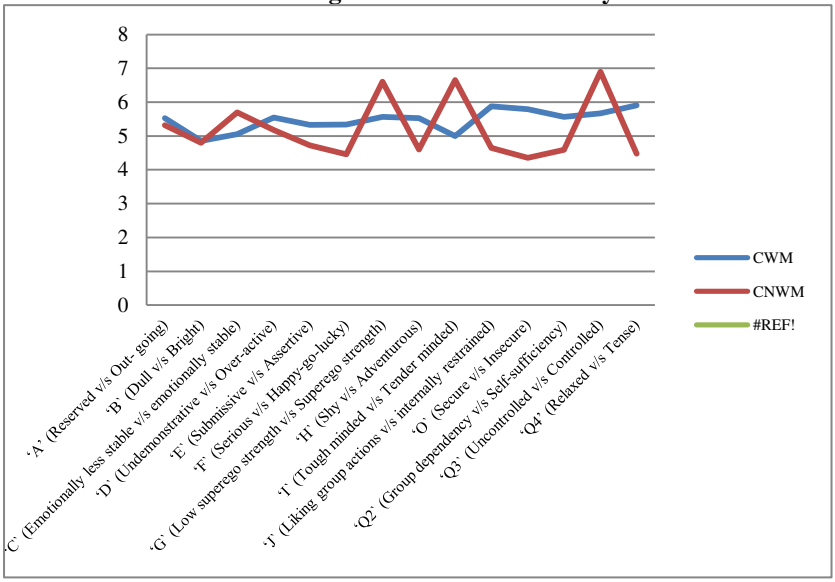
Table I: Significance of the mean difference between Children of working and non-working Mothers (N=400 on each) on Personality.

Personality (Factors)	Group	N	Mean	Std. Deviation	t-test	Level of Sig.
'A' (Reserved v/s Out- going)	CWM	400	5.53	1.423	2.28	Sig. at 0.05 level
	CNWM	400	5.32	1.149		
'B` (Dull v/s Bright)	CWM	400	4.86	0.86	0.99	Insignificant
	CNWM	400	4.80	0.90		
'C` (Emotionally less stable v/s emotionally stable)	CWM	400	5.05	1.107	7.89	Sig. at 0.01 level
	CNWM	400	5.70	1.111		
'D` (Undemonstrative v/s Over-active)	CWM	400	5.55	1.350	4.31	Sig. at 0.01 level
	CNWM	400	5.18	1.076		
'E` (Submissive v/s Assertive)	CWM	400	5.33	1.234	7.57	Sig. at 0.01 level
	CNWM	400	4.72	1.089		
'F` (Serious v/s Happy-go-lucky)	CWM	400	5.34	1.352	10.12	Sig. at 0.01 level
	CNWM	400	4.46	1.105		
'G` (Low superego strength	CWM	400	5.57	1.113	13.7	Sig. at 0.01

v/s High Superego strength)	CNWM	400	6.61	1.128	6	level
'H` (Shy v/s Adventurous)	CWM	400	5.53	1.38	10.91	Sig. at 0.01 level
	CNWM	400	4.60	0.98		
'I` (Tough minded v/s Tender minded)	CWM	400	5.00	1.234	17.98	Sig. at 0.01 level
	CNWM	400	6.65	1.335		
'J` (Liking group actions v/s internally restrained)	CWM	400	5.88	1.083	16.80	Sig. at 0.01 level
	CNWM	400	4.65	1.035		
'O` (Secure v/s Insecure)	CWM	400	5.79	0.96	19.80	Sig. at 0.01 level
	CNWM	400	4.35	1.034		
'Q_2` (Group dependency v/s Self-sufficiency)	CWM	400	5.57	1.269	11.46	Sig. at 0.01 level
	CNWM	400	4.59	1.125		
'Q_3` (Uncontrolled v/s Controlled)	CWM	400	5.67	1.143	14.63	Sig. at 0.01 level
	CNWM	400	6.90	1.336		
'Q_4' (Relaxed v/s Tense)	CWM	400	5.91	.982	20.07	Sig. at 0.01 level
	CNWM	400	4.48	.971		

CWM= Children of Working Mothers; CNWM= Children of Non-Working Mothers

Fig. I: **Showing the mean comparison between Children of working and non-working Mothers on Personality.**



Interpretation and Discussion

It is obvious from the table I that children of working and non-working mothers differ significantly on factor 'A'(Reserved v/s Out-going)of

personality at 0.05 level which indicates that children of working mothers are warmhearted, outgoing, easygoing and participating as compared to children of non-working mothers who were found as reserved, cool, precise, aloof, skeptical and rigid.

The results seem to be justified on the ground that the children of working mothers get opportunities to be outside with their friends and often do their assignments independently. They find less interference or dictations from their mothers. They do not bother to show any seriousness towards their different assignments. On the other hand, children of non- working mothers do find their mothers at their homes often inspecting and enquiring about their assignments and hence they become responsible and objective in their dealings. This responsibility and objectivity on their part helps them to be critical and rigid in their approach.

The table I reveals that there is no significant mean difference between children of working and non-working mother son factor 'B' (Dull v/s bright) of personality, hence no conclusion can be drawn.

The perusal of table I makes it clear that there is a significant mean difference between children of working and non-working mothers on factor 'C' (emotionally less stable v/s emotionally stable) of personality at 0.01level, which indicates that children of working mothers are emotionally less stable as compared to children of non-working mothers who were found as emotionally stable. The results infer that children of working mothers are easily upset, perturbed and worrying. On the other hand, children of non- working mothers are calm, faces reality, are stable and constant in interests. Since working mothers do not get ample time to spend with their children to give them love, care and support. Such children face hindrances in making different adjustments in their lives. This lack of adjustment frustrates them and they feel insecure, worrying and perturbed. On the other hand, children of non-working mothers are calm, getting warmth and supportive environment at their homes. These children do not face any type of emotional disturbances while making different adjustments in their lives. They are not easily upset and hence are mature enough to face the realities of different situations objectively.

The perusal of table I makes it clear that there is a significant mean difference between children of working and non-working mothers on factor 'D' (undemonstrative v/s over-active) of personality at 0.01level, which indicates that children of working mothers are demanding, over-

active and excitable. Since they don't get dictations from their mothers at their homes, they are often demanding and un-restrained. On the other hand, children of non-working mothers do not get ample chance of doing things separately. The interference from their mothers makes them inactive, slow and sluggish in their approach.

The table I reveals that, children of working and non-working mothers differ significantly on factor 'E' (submissive v/s assertive) of personality at 0.01level, which indicates that children of working mothers are assertive, self-assured and independent minded. Since they do not find any helping hand at their homes, they rely upon their own efforts and initiatives. Hence they are not confined to the conventional approach of solving their different problems they face in their routine lives. On the other hand, children of non-working mothers are submissive and dependent. They do act upon the suggestions and advices given to them by their mothers. Their behaviour is characterized by submissiveness.

The perusal of table I makes it clear that there is a significant mean difference between children of working and non-working mothers on factor 'F' (serious v/s happy-go-lucky) of personality at 0.01level, which indicates that children of working mothers are happy-go-lucky, carefree, heedless and careless. Since these children do not face any interference from their mothers, they develop the happy-go-lucky attitude in the atmosphere of their homes. Contrary to it children of non-working mothers are serious, introspective and reflective. They do develop such traits in their home environment where their mothers put certain standards to be observed by these children.

The table I makes it obvious that there is a significant mean difference between children of working and non-working mothers on factor 'G' (low super ego strength v/s superego strength) of personality at 0.01level, which indicates that children of non-working mothers are emotionally disciplined, conscientious and dominated by the sense of duty. They are very much concerned about the moral standards and rules. They often try to abide by the set standards of the society. Contrary to it children of working mothers are undependable and they disregard the rules and norms of the society. Their obtained low score depicts that they are having less regard for the moral standards. The reason can be non-availability of mothers in their home where they are free to do what they like, due to her prolonged absence from the home.

The table I makes it obvious that there is a significant mean difference between children of working and non-working mothers on factor 'H' (shy v/s adventurous) of personality at 0.01level. The result indicates that children of working mothers are adventurous. It can be inferred that children of working mothers get exposed to different problems of their lives and they themselves make efforts to solve them by using their own abilities. By confronting different situations and handling them separately makes them socially bold. On the other hand, children of non-working mothers do not get any exposure to solve their problems by making their own efforts. They often seek help from their mothers who are readily available for them. This dependence on their part makes them shy.

It is obvious from the table I that there is a significant mean difference between children of working and non-working mothers on factor 'I' (tough minded v/s tender minded) of personality at 0.01level, which indicates that children of non-working mothers are tender minded often seeking help and sympathy from others. Since they are not practical in their dealings, they often expect attention and favours from their mothers, who are present to provide the same. On the other hand children of working mothers are tough minded and self-reliant, they take their own responsibilities for the accomplishment of different tasks.

It is clear from the table I that there is significant mean difference between children of working and non-working mother son factor 'J' (liking group actions v/s internally restrained) of personality at 0.01level, which indicates that children of working mothers are internally restrained. It can be inferred that children of working mothers often do things out of their own initiatives and do not rely upon any external care and support. They are very much reflective and evaluative in their approach of solving their own problems. On the other hand children of non- working mothers are habitual to depend on the help and support of their mothers. They don't care for doing things out of their own efforts and 'liking group action' goes a personality trait with them.

It is obvious from the table I that there is significant mean difference between children of working and non-working mother son factor 'O' (secure v/s insecure) of personality at 0.01level.The result indicates that children of working mothers are insecure as compared to children of non-working mothers who were found as secure. The result seems to be

justified on the ground that when the child is deprived from healthy family care, his emotional development is hampered. The most important role in family towards children is played by his/her mother. It is the mother who provides the child love, care, affection, acceptance and security. Since children of working mother are deprived of this care and affection, they develop a sense of insecurity. On the other hand non- working mothers satisfy the emotional needs of their children by providing them love, care and support. So these children feel a sense of security.

It is clear from the table I that there is significant mean difference between children of working and non-working mothersonfactor'Q_2' (group dependency v/s self-sufficiency)of personality at 0.01level, which indicates that children of working mothers are self-sufficient as compared to children of non-working mothers who were found as group dependent. The results signify that children of working mothers do get ample chances of solving their problems by their own efforts and take their own initiatives in solving their own problems, i.e. why these children feel a sense of self sufficiency. On the other hand children of non-working mothers always find a helping hand from their mothers, who take care of their assignments and other issues. They rely more on their mothers. This makes them somehow lethargic and sluggish, and hence they are group dependent.

It is obvious from the table I that there is significant mean difference between children of working and non-working mother son factor 'Q_3' (uncontrolled v/s controlled) of personality at 0.01level, which indicates that children of working mothers are un-controlled. The analysis seems to be justified on the ground that children of working mothers do not have much interference on the part of their mothers. These children usually do their daily tasks by their own efforts. They try to solve their own problems by making any attempt. The unchecked attempt on the part of their mother makes them uncontrolled, careless of social values and has low self- sentiment. On the other hand children of non-working mothers find their mothers readily available, who checks and prevents them from doing wrong things. Their mother's interference makes them aware about social norms and values that is why these children are controlled, have high strength of self-sentiment and are socially precise and compulsive.

It is obvious from the table I that there is significant mean difference between children of working and non-working mother son factor 'Q_4'

(relaxed v/s tense)of personality at 0.01level, which indicates that children of working mothers are tense. It can be inferred that children of working mothers feel a sense of isolation, on the basis that they do not find their mothers providing the needed love, care and affection and this negligence on their part disturbs and frustrates them. Non availability of mothers develops in them a sense of loneliness and thus they remain under stress. On the other hand, children of non-working mothers do not feel any such disturbances because, their mothers are there to encourage their efforts and they cooperate in solving their different issues relating to their different adjustments of their lives. This conducive environment helps them to be relaxed and do not face any kind of frustration.

The result presented in table I are substantiated by figure I. The results interpreted and discussed above are in line with: Miller (1975), Collins (1975), Burke & Weir (1977), Ribble (1979), Sharma (1986), Mody and Murthy (1988), Vijay (1990), Vandell & Ramanan (1991), Sroufe et al (1993), Koschanska (2001), Ora, Einaya&, Ehlas (2006) and Singh & Kiran (2014)

Miller (1975) reveals that daughters of working mothers were found to be more aggressive and less passive than daughters of non-working mothers. Collins (1975) found that low income families from various racial and ethnic groups showed poorer personality and adjustment among children of part time working mothers than children of non-working or full time working mothers. Burke & Weir (1977) found the daughters of working mothers described more feelings of loneliness and isolation, more resultant stress and slightly poorer personality adjustments than daughters of non-working mothers.

Ribble (1979) has found that children who were not fortunate enough to have the loving, caring and constancy of their mother during their earlier years reacted with negativism, hypertension and emotional imbalance. Sharma (1986) has revealed that the children of non-working mothers were found to be more tender-hearted, sensitive, dependent and more protective. Mody and Murthy (1988) have revealed that the children of employed mothers were found to be careless and slightly emotionally unstable in the early years compared to the children of non-employed mothers. Vijay (1990) has revealed that significant difference was found in the personality of the male / female children of working &non-working mothers. Vandell & Ramanan (1991) have found that children with latch key experience

have more behavior problems and are emotionally weak. Sroufe, et al (1993) have found that insecurely attached infants by contrast often have later problems, inhibitions and negative emotions in toddler hood, hostility towards other and dependency during the school years. Koschanska (2001) has found that insecurely attached toddlers show more negative emotions (fear, distress and anger) while securely attached children show more joyfulness, even in the same situation. Ora, et.al (2006) have that the children of working mothers were having more difficulties and being less adjusted to kindergarten. Their adjustment to day care was also poorer. Singh & Kiran (2014) found that children of working mothers are more affected on personality than children of non-working mothers.

In the light of findings, discussed above and substantiated by some researchers the hypothesis which read as: "*There is significant difference in personality profiles of children of working and non-working mothers" stands partially accepted.*

Conclusion

1. Children of working mothers were found as warmhearted, outgoing, easygoing and participating as compared to children of non-working mothers who were found as cool, precise, aloof, skeptical and rigid.
2. Children of working mothers were found as changeable, easily upset, perturbed and worrying. On the other hand children of non-working mothers were found as calm, faces reality, stable and constant in interests.
3. Children of working mothers were found as demanding, over-active and excitable. On the other hand, children of non-working mothers were found as inactive, slow and sluggish in their approach.
4. Children of working mothers were found as assertive, self-assured and independent minded. On the other hand children of non-working mothers were found as obedient, submissive and dependent.
5. Children of working mothers were found as happy-go-lucky, carefree, heedless and careless. In contrary to it children of non-working mothers were found as serious, introspective and reflective.

6. Children of non-working mothers were found to have high super ego strength, are emotionally disciplined, conscientious and dominated by the sense of duty. Contrary to it children of working mothers were found as undependable, dis regard rules and have low superego-strength.
7. Children of working mothers were found as bold and adventurous, on the other hand children of non-working mothers were found as shy and restrained.
8. Children of non-working mothers were found as tender minded and dependent. On the other hand children of working mothers were found as tough minded and self-reliant.
9. Children of working mothers were found as reflective and internally restrained, on the other hand children of non- working mothers were found as zestful and like group actions.
10. Children of working mother were found as insecure and worrying while as children of non- working mothers were found as secure and cheerful.
11. Children of working mothers were found as self-sufficient, on the other hand children of non-working mothers were found as group dependent and sound follower.
12. Children of working mothers were found as uncontrolled, careless and have low self- sentiment. On the other hand children of non-working mothers were found as controlled, have high self-sentiment, socially precise and are compulsive.
13. Children of working mothers were found as tense and frustrated, on the other hand children of non-working mothers were found as relaxed and composed.

Inferential Suggestions

- Due attention should paid to the period of adolescence since the students at this stage are more prone to encounter various psychological problem, which are likely to affect their physical, mental, emotional, health, home, social and educational adjustment.
- Working mothers need to talk to their children to understand their psychological needs and also to help them in their studies and choosing their career etc. This will help a lot to understand and to sort out their problems.

- Working mothers should create such an environment in which the children can express their feelings and share their emotions with them. Opportunities should be given to the children to realize that they too have their own independent existence, which can build self-confidence in them. This in turn consequently will reduce their behavioral problems and enhance their ability for adjustment.
- The working mother should stay at her home for at least two to three years, during the period of infancy of her child.
- The working mothers should be aware about the ill effects of being away from their home, when their children are in early age.
- Guidance and counselling facility should be available in school for bridging the gap of parental absence in the home for long period of time.
- Working mothers should give priority to the interaction with their children at home than their job assignments at home.

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Students' Opinion about some Aspects of the Organization of Community Service Programme

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Abstract:

As one of the human service organizations, the general mandate of the school is that of service i.e. maintenance and improvement of the general well-being and social functioning of the students. The predominant function of such organization is 'changing people'. Nowadays schools have employed several functionaries to further the purpose of quality concern in school premises. School Social Workers is one such functionary who is instrumental in furthering the purpose of the schools. It may be worthwhile to study whether the goals and orientation of social work profession is compatible with the purpose of the overall educational system of which the school forms only one of the important segments. A small study was undertaken to study the attitudes and perception of students towards school's social work programme. This research paper tells us about those attitude and perceptions.

Key words: *School Social Work, Community Service Projects, Perception, Implementation*

Introduction

Students are the centre around which the different subsystems within the school structure revolve like concentric circles. They are the focal point of the whole universe called school. The students assume still greater importance in the context of the programme organized by the School Social Worker. The students here are not only the consumers or beneficiaries but also products of learning process initiated or supplemented by the School Social Workers. The school social workers provide situation wherein the learning outcomes for the students are the results of students own inputs more than those of the teachers or the School Social Workers. Even when apparently, activities are for the benefit of different members of the community-school or outside, the purpose of the activities conducted has students learning as its primary concern. It is therefore very important to ascertain as to what the

students think or feel about the school social work programmes as they are conducted in different schools.

For this purpose, a study was conducted on 160 students belonging to 40 schools of Delhi and their responses were elicited on various dimensions of the school social work programme. These dimensions included broadly the issue of usefulness/need of a particular programme, relevance of social workers in the school, social workers vis-à-vis teachers, social workers modus operandi and the impact of the programme on different constituents of the school community.

This paper provides information about respondents (students) and their perception about some of the aspects of organization of community service programme (CSP) viz, levels at which they participated in community service projects, orientation received prior to initiating work in the projects, and the manner of projects allocation. The queries on which information was sought also included reason for opting for a particular project, activities (within the project) liked or disliked most, persons from whom guidance was received and support received from family members.

Orientation to Community Service Projects

Except a few, almost all the respondents (147 out of 160) reported having received orientation to Community Service Projects and they found it useful (80) or somewhat useful (67) later in performing the Community Service Projects.

Project Allocation

Of 149 respondents who replied to the query, 106 stated that they themselves had opted for the projects in which they had been working. Forty three (43) respondents had been assigned the projects by the school social workers.

Reasons for Opting a Particular Project

Responses to a multiple choice question revealed that major reasons for respondents opting a particular project included 'liked the nature of work' (85) and 'wished to have new experience' (71). For quite a considerable respondents (55), the project appeared challenging to them and hence the decision for option of a particular project. One fourth of the respondents (42) undertook a particular project because he/she liked interacting with different group of people which was bound to happen during Community Service Projects. Twenty eight (28) respondents

were of the view that they took a particular project because they felt that they could give their best. Only four students (incidentally all boys) reported that they had gone for a particular project because they had no idea about the different options given to them. For other reason which led to respondents to opt for project see **Table 1.**

Table 1: Respondents (Students) Reason for Opting a particular Project

S. No.	***Responses***	**Frequency**	***% of total number of respondents****
1.	Likes the nature of work	85	53.125
2.	Wished to have new experience	71	44.375
3.	Project appeared challenging	55	34.375
4.	Liked mixing/working with different people	42	26.25
5.	Felt they could perform better in the project	28	17.5
6.	Project work not likely to interfere with studies	15	9.375
7.	Liked the supervisor	13	8.125
8.	Friends doing the same project	12	7.5
9.	Easy work/ easy to score good grades	10	6.25
10.	Parents suggestions/utility for career	8	5.0
11.	Prior Exposure	7	4.375
12.	Did not like other options	4	2.5
	Total number of responses from 160 students	350	

***** *Percentage had been worked out of 160*

By relating the reasons for opting a project and the projects in which they participated, an attempt was made to identify respondents' initial response to different projects (i) from among those who had opted for a project because the project appeared challenging, almost half of them (28) opted for Non Formal Education (NFE) or village projects,

eighteen respondents considered working in projects categorized under 'service to school community' challenging. The remaining 9 respondents opted for hospital service (4) blind welfare (3) and welfare of the mentally handicapped (2) projects because of the similar reasons. (ii) Of 42 respondents who opted for particular projects because it was likely to offer opportunities for working/mixing with people, 32 had opted for NFE or village project; 5 each for hospital service and welfare of the handicapped (in agencies outside school).

The reason for opting a project reflect respondents desire for new and challenging experiences and for mixing with a variety of people beyond the confinement of their immediate environment, which are understandable party in the context of their being adolescence.

Activities liked most

Respondents were asked as to which of the activities undertaken within the project they did like most. The largest single group of respondents (75 out of 144 who replied to the question) stated that they liked the task of teaching the most the proportion of girls being slightly more than that of the boys (49 and 46.6% respectively).

Among the 34 respondents who liked mixing, helping or interviewing people most, the proportion of girls was higher than that of the boys (21 % and 11% respectively).

Activities like least

Almost one-fourth of the respondents (38) did not reply to the question and 14 respondents stated categorically that they liked all the activities performed by them in CSP projects. Of the remaining (108), 23 did not like teaching, 8 of these specifying that they did not like giving tests, checking homework, disliked forcing student to study or play. Thirteen respondents did not like to write report of the work done by them.

From the foregoing description of responses to the type of activities undertaken by the respondents, teaching followed by interacting with people appears to be liked by the students. On the other hand, forcing children to play and study and writing reports were relatively less acceptable tasks within CSP. No significant trend with regard to sex-based distribution of respondent according to the activities liked or disliked was observed. The only fact that emerged was that relatively larger proportion of girls than boys liked interacting with people (in

connection with community service projects work) or working with children.

Family support to respondents for participation in CSP

Family support was assessed on the basis whether (i) the parents/siblings had prior knowledge about CSP (ii) family member took active interest in the task performed by the respondents and (ii) respondents discussed with their family members various activities in which they (respondents) participated.

Mother appeared to be more involved with the respondents' participation in community service projects than any other family member. The proportion of respondents indicating that mother had prior knowledge of CSP of school (72.5%), took interest in respondents work (51.875%) and that respondents choose to discuss with mothers the activities related to CSP (58.75) were higher than corresponding proportion of fathers or family members. (See **Table 2, 3 and 4**)

Table 2: Distribution of respondents according to family member's prior knowledge of community service programme

Person	***Frequency of response***			***Total***
	Yes	**No**	**No response**	
Mother	116 (72.5)	38 (23.75)	6 (3.75)	160
Sibling	101 (63.125)	40 (25.0)	19 (11.875)	160
Father	95 (59.375)	50 (31.25)	15 (9.375)	160

Table 3: Frequency distribution of respondents according to interest shown in their CSP work by Parents/Family members

Person	**Frequency of responses**			**Total**
	Yes	No	No response	
Mother	83(51.875)	69(43.125)	8 (5.0)	160
Father	60(37.5)	88(55.0)	12(7.5)	160
Family Members	48(30.0)	89 (55.625)	23(14.375)	160

It is interesting to note that **Table 2 & 3** reflect that different members in the family showed varied level of prior knowledge and interest vis-a vis their wards association with Community Service Programme. Mothers seem to be more involved in their wards non-scholastic activities in the schools.

Table 4: Distribution of respondents according to the persons with whom respondents discussed CSP activities

Person	Frequency of responses			Total
	Yes	No	No response	
Mother	94 (58.75)	45 (28.125)	21 (13.125)	160
Father	70 (43.75)	67 (41.875)	23 (14.375)	160
Family member	60 (37.5)	62 (38.75)	38 (23.75)	160
Friends	113 (70.625)	28 (17.5)	19 (11.875)	160

Figure in **Table 3** further shows that a substantial proportion of respondents (43.125%) indicated that mothers did not take interest in their CSP related activities.

Figure in **Table 4** reveal that respondents tended to discuss their CSP activities much more with their friends than even with the family members. Although a majority of parents and siblings were aware of CSP of the respective schools, the foregoing description of responses reflects a general lack of interest /involvement with respondents work in CSP project among family members.

Respondents Perception of others/ own Attitude towards CSP

An overwhelming majority of respondents (133 out of 160) perceived their attitude towards Community Service Programme as favourable. Relatively larger numbers of teachers than parents were perceived to demonstrate favourable attitude towards Community Service Programme (CSP). (See **Table 5**)

Table 5: Students' perception of others and their own attitude towards CSP

Persons	Attitude			No response/ Not applicable
	Favourable	Partly favourable	Unfavourable	
Self (respondent)	133	13	5	9
Teachers	96	45	5	14
Parents	81	59	10	10
Beneficiaries	74	45	5	36
Friends	60	68	21	11
Family members	49	59	12	40
Community people	46	28	11	75
Agency staff	40	16	6	98

The data in **Table 5** further show that respondents felt that their friends have partly favorable (68) or unfavorable attitude (21) towards the community service programme (CSP).

Suggestions regarding Implementation of CSP

A significantly larger number of respondents (94 out of 160) wished the programme to be organized in the form of short term projects (71) or during vacation only (23); then those (66) wishing to continue with the existing system of organizing CSP along with time table, i.e., in regularly allocated periods throughout the academic year.

Respondents views about the Class-Level at which CSP should be Conducted

The largest single group of respondents (63) wished the programme to be a part of the entire educational process. They felt that students of all classes should participate in CSP. At the same time, irrespective of the level at which the existing programme were being conducted in the schools under study, 39 respondents wished the programme to be organized during IX and XI classes. These respondents apparently had in mind the board examinations which are held at the end of X and XII classes. The rest of the respondents (58) provided mixed responses.

Respondents Opinion about Different Aspect of CSP

This portion describes the opinion of the respondents with regard to a number of important aspects of organization of CSP viz, concept and expected outcome of CSP, implementation of CSP tasks/activities-related issues, evaluation of students' performance in CSP project and supervision of student work and impact of CSP projects on students. The description is followed by a comparative over-view of the opinion.

Concept of Community Service Programme

Almost all the respondents (154/160) agreed that all the constituents of a school i.e., students, teachers, parents should extend their service to the community (**Statement 1 & 3** in the **Table 6**). A very large majority of respondents (120) further held the view that CSP was not just a publicity stunt of the student. The respondents also concurred with the view and CSP project provided learning through firsthand experience (139).

Table 6: Distribution of Respondents (Students) according to their perception of concepts of Community Service Programme

S. No.	*Statement*	*Responses*		
		Agree	**Disagree**	**Undecided**
1	As part of an educational institution, students teachers and parents should extend their services to the community	154 (96.25)	2 (1.25)	4 (2.5)
2	School is in itself a community	150 (93.75)	4 (2.5)	6 (3.75)
3	To serve the community is not the job of the students	4 (2.5)	152 (95.0)	4 (2.5)
4	CSP is just a publicity stunt of the school	28 (17.5)	120 (75.0)	12 (7.5)
5	Community service programme/ projects provide learning through first-hand experience	139 (86.875)	9 (5.625)	12 (7.5)
6	School authorities exploit student willingness to help	40 (25.0)	110 (68.75)	10 (6.25)
7	Projects performed within school premises are really no service	48 (30.0)	88 (55.0)	24 (15.0)
8	Interaction between the handicapped and the no-handicapped is mutually beneficial.	124 (77.5)	16 (10.0)	20 (12.5)
9	Community service scheme is meant more to benefit students than community	32 (20.0)	105 (65.625)	23 (14.375)

From the **Table 6** it appears that almost all the students agreed with the opinion that school was in itself a community (93.75% of respondents). However a lesser proportion of respondents (55%) perceived CSP projects performed within school to belong to the domain of community service (**Statement 7**).

Data in the table also show also that over three-fourths of respondents admitted that inter-action between the handicapped and non-handicapped was mutually beneficial (124). At the same time a majority of respondents believed that the primary purpose of CSP

(under SUPW scheme) was to benefit the community rather than the students (105).

The exercise of knowing students' opinion about various aspects of the organization of community service programme highlights the fact that students have nowadays become quite aware of a school social worker working in their midst and they are willing to take *"fast changing changes"* in their strides.

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Changing Structure of Teacher Education in the Context of Bachelor of Education Programme: An Analytic Stand

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Abstract

Teacher Education in India is no more a stagnant filed that it once was. Efforts have been made to upgrade the education of teachers and to draw from the innovative work done in different parts of our country and in other parts of the world in the field of teacher education. The concept of 'Reflection and Reflective Practices' has emerged as one of the core guiding aims of teacher education as evident in the recommendation of National Curriculum Framework for Teacher Education-2009, position paper on 'Teacher education for curriculum renewal', guidelines given in the form of norms and standards for different Teacher Education Programmes (TEPs)-2014 given by National Council of Teacher Education (NCTE) and the recently proposed Curriculum Framework for Two-year B.Edprogramme by NCTE. This paper looks at these recent changes with major focus on the latest Curriculum Framework for Two-year B.Ed programme. The framework with its aim to produce 'reflective practitioners' has been analysed using Tom's (1985) notion of the 'arenas of the problematic'. Tom specifies four arenas of the teaching situation, arranged by degree of comprehensiveness, which can be subjected to doubt, inquiry and reflection. Moving from the small to the large, these arenas are the teaching-learning process, subject matter knowledge, political and ethical principles underlying teaching and educational institutions within their broad social context (Valli, 1993). Overall the Framework displays a 'programmatic level of intervention' as opposed to the piecemeal approach to create reflective practitioners.

***Key Words**: Reflection, Reflective practices, Teacher Education, Reflective Teacher,Arenas of the Problematic,B.Ed Curriculum Framework*

Reflection as a concept has gained great significance in the past few decades. The increased number of publications in the form of research papers, textbooks and journals in the field of reflective practice are also an indicator of the growing relevance and popularity of this field."During the 1950s the push for practitioners to be more reflective

grew and was taken up in many of the professions, especially teaching, as the theoretical aspects of reflective thinking began to take hold through teacher preparation (Borrowman, 1956)" (Dimova & Lougrahn, 2009, p.207). To include or highlight the reflective component in Teacher education programmes (TEP) is no more considered as a good add-on but the field of 'reflection' has rather emerged as the core value that a TEP should thrive upon if its objective is to create effective practitioners.

The tradition of teacher training that has a history of roughly two centuries has gone through at least three distinct stages namely craft model, applied science model and reflective model. Reflective model paves the way for self-development and follows bottom-up approach as opposed to the top-down approach followed in the previous two models. In the reflective model the student-teachers are encouraged to invent the knowledge of the world around them on the basis of novel experiences and their existing schema, thus makes it a continuous cycle of practice and reflection. (Mohanraj, 2009).

National Curriculum Framework for Teacher Education-2009 (NCFTE-2009) recommends that 'prospective teachers should develop habits and the capacity for self-directed learning, have time to think, reflect, assimilate and articulate new ideas; be self-critical and to work collaboratively in groups' (p.24).Rao(1998) while discussing the policy framework in education mentions "In the NPE-1986, improvement in the status and professional competence of teachers is envisaged as the cornerstone of educational reconstruction." (p.5) It is essentially in this light that the practice of reflection becomes important in teacher education in order to make teachers more professional.

The position paper on 'Teacher education for curriculum renewal' put forth that "a quick glance through surveys of educational research in India conducted periodically over the years 1947-1998 substantiates the point that teacher education programmes have remained unchanged in terms of their substance, experiences offered and modalities adopted" (p.3).However, in recent past the field of teacher education has witnessed some crucial advances. The National Council for Teacher Education (NCTE) playing its instrumental role in upgrading the field of teacher education has come up with regulations for different levels and areas of teacher education in the year 2014. Detailed norms and

standards are prescribed for different TEPs. These guidelines give a way for a more reflective teacher education. If looked at the regulations given for **first degree or diploma in teacher education**, it can be culled out thatthat a varying degree of emphasis is given to the inclusion of 'reflective practices' in the curricula of different teacher education programmes. In the case of degrees such as B.Sc.B.Ed integrated programmes and in B.El.Ed, distinguished steps have been suggested to instill the ability to reflect in the prospective teachers. However, programmes like D.El.Ed through open and distance learning (ODL) still lie at the fringes of a well-articulated reflective teacher education programme.

However, if more focus is given to the curriculum as a whole it shows remarkable attributes indicating the growing emphasis on 'reflective practice' in teacher education. Components like case study, observation of children, interaction with community members in different socio-cultural contexts, interaction with peers and critical analysis of curricular aims and context, all point towards an emerging reflective teacher education approach.

The Curriculum Framework given for two year B.Ed programmes by NCTE is a milestone and marks a major shift in teacher education. It is backed with the belief that the development of the ability and skills to be able to become an effective teacher demands a certain basic time period of active engagement in both the conceptual courses and in the field. This year onwards the duration of the B.Ed programme has been increased to two years as against the duration of one academic year which was practiced until last year. The curriculum framework given by NCTE outlines the new B.Ed programme structure and the opening statement of the document reads "This document presents the course structure for the NCTE Two-year B.Ed. Programme and outlines the nature of experiences to be offered to the student-teachers to make them **reflective practitioners**" (p.2) (emphasis mine).

This paper looks at this framework from an analytic perspective and the content of the curriculum framework in terms of its reflectivity is analysed using Tom's (1985) notion of 'arenas of the problematic'. Tom, while explaining the 'arenas of the problematic' shares that an inquiry oriented teacher education programme should make a conscious and conscientious effort to help the prospective teachers to raise doubts and questions about the so-called normal routine practice of teaching and learning. He has proposed four different arenas of the teaching and

he places them on a continuum wherein the continuum begins with a small arena of the 'teaching-learning process'. Next arena is the 'subject matter knowledge' that warrants problemtaization of what we term as the body of the knowledge under a particular subject. Further comes the arena of 'political, ethical principles underlying teaching' and on the farthest end of the continuum lies the arena of 'society at large with educational institutions as a part of it'. Thus these arenas are one way of analysing the **reflective content** of a teacher education programme. This paper attempts to look at the curriculum framework for two year B.Ed programme from the angle of these 'arenas of the problematic' and to understand the nature of the content and approach espoused for this new programme.

The Curriculum Framework for the 2 year B.Ed programme proposes three broad curricular areas namely; Perspectives in Education, Curriculum and Pedagogic Studies and Engagement with the field. The analysis of the programme is done under two heads; content of reflection and quality of reflection wherein the category 'content of reflection' means what kind of curricular areas and themes are suggested and render themselves as the content for reflection whereas the 'Quality of reflection' means what is regarded as reflective quality and what is the conception of 'reflection' as proposed by the programme.

I. Content of Reflection

The six courses covered under the curricular area of 'Perspectives in Education' are an effective combination in the sense that all arenas beginning from the small ones of 'teaching - learning process' and 'subject matter knowledge' to the broader arenas of 'education- ethical principles and social context'have been given an appropriate emphasis. The titles of the six courses under the category of 'Perspectives in Education' are; 'Learning and Teaching', 'Childhood and Growing up', 'Knowledge and Curriculum', 'Contemporary India and Education', 'Gender, School and Society' and' Creating an Inclusive School'. It is noteworthy that the course titled 'Learning and Teaching' does not consist of technical connotations of teaching per se but problematizes the process of teaching learning by encouraging 'prospective teachers to reflect on and critique notions of learning and teaching as they have formed from their own experiences and move beyond them' (p.10).

The next curricular area of 'Curriculum and Pedagogic Studies' although places primary emphasis on the smallest arena of 'teaching

and learning'; however, broader arenas have been integrated by encouraging critical understanding of the school curriculum, social context of learning, linking school knowledge with community life and understanding the epistemological and pedagogical basis of different school subjects. Thus an effort has been made to help the prospective teachers not only learn to problematizes the teaching-learning processes but also to situate the processes in the broader political, ethical and social spaces. It is advised that student-teachers thorough knowledge of a school subject includes an understanding of the 'theory of content' (p. 13) and questioning the notion of curriculum as 'given' (p.15), thus enabling the teachers to learn to understand how a particular body of content gets selected and get framed in the curriculum. Pedagogy has also been looked at from the perspective of 'critical pedagogy' (p. 15). Unlike what Valli (1993) found out, the second arena of 'problematizing the subject matter knowledge' in Tom's arenas of the problematic, also gets a definite place in this framework when the student-teachers through different courses on pedagogy and 'disciplines and subjects' are given an exposure of the changing nature of school subjects and how we need to critically look at the subject knowledge.

The third component of 'Engagement with the Field' comprises engagement with the schools and other educational institutions. Content of reflection comes basically from the experiences that student-teachers will have in the field while observing and teaching the learners. These experiences provide a very organic and dynamic experience to the student teachers and 'lead to the development of a broad repertoire of perspectives, professional capacities, teacher dispositions, sensibilities and skills' (p. 6). Courses on 'Enhancing Professional Capacities' (EPC) is a thoughtful addition in the curricular area of 'Engagement with the Field'. Keeping the latest concerns in consideration 'Critical Understanding of ICT, and 'Drama and Art in Education' are included. Incorporation of courses titled 'Reading and Reflecting on text' and 'Understanding the Self' points to an explicit emphasis on reflection. As explicated by Valli (1993), the theme of 'self as a teacher' doesn't fall explicitly into any of the four Tom's arenas of the problematic. While analysing different teacher education programmes, Valli (1993) found that the theme of 'self as a teacher' was present in few of the teacher education programmes. Drawing similarity with this finding, the curriculum framework for B.Ed shows a direct treatment of this component when it says that 'The aim of the course is to develop

understanding of student-teachers about themselves –the development of the **self as a person and as a teacher**, through conscious on going reflection' (p.22).

II. Quality of Reflection

The framework though makes use of different phrases like 'critical examination', 'critique', 'questioning', 'introspection' in addition to using the term 'reflection' several times, yet it does not clearly indicate what the term 'reflection' or the 'reflective process' will entail. Thus there are chances that student-teachers or teacher educators themselves may get stuck to a superficial reflection not knowing the different levels and types of 'reflection' itself. One important marker of assessing the quality of reflection as espoused in the programme is to look for opportunities given to the prospective teachers to problematize the theory and practice relation (Valli, 1993). In this sense the B.Ed Curriculum Framework encourages the student-teachers to explore the theory-practice connection by providing them with opportunities to undertake various fielded based studies in all the courses; 'All the courses include in-built field-based units of study and projects along with theoretical inputs from an interdisciplinary perspective' (p.2). Field based projects; observation and interaction are closely woven in almost every course in one form or the other and thus preparing the ground for the pre-service teachers to understand the complex relation of knowledge and practice. Perspectives gained from research studies have been talked about at a very few places in the curriculum; e.g. including research relating to different aspects of young children's learning (pg.3), current research on multilingual education (pg.10). Therefore this important area of theory-practice which relation remains under emphasised in the curriculum. Further, even when the framework includes research, it does not question is as to where: it will elaborate exactly how the knowledge gained from research studies will be treated, to be treated as 'taken for granted' or there will be equal emphasis on the 'contextual importance of research findings and the tentativeness of the theory-practice relation'.

Conclusion

With various reflective components of the programme such as field based projects, reflective journal writings, Enhancing Professional Capacities (EPC) and an overall approach of including themes and topics that lay emphasis on small and broad arenas of teaching, this curriculum adopts a 'programmatic level of intervention' to make

teachers more reflective and moves beyond the piecemeal approach. The framework is a departure from the technical orientation of teacher education and brings forth the element of what Valli (1993) terms as 'deliberative and dialectical modes of reflection'. 'In deliberative reflection, knowledge about teaching is relativistic, dependent on context, and is used to inform, not direct, practice' (Valli, 1993, p.13). Dialectical reflection is about interpersonal and intrapersonal dialogue to construct personal meaning through reflection. The increased duration, revised programme content and approach all have contributed to this new and robust teacher education programme of B.Ed. A recent study on B.Ed Student-teachers found out that though they could define 'reflection' in some form, yet they were not aware of the concept and processes of reflection as it has been emphasised in NCFTE -2009 (Bhatia & Bhatia, 2014). This indicates a very crucial point for the programme to be effective in transaction that student-teachers get continuous encouragement and exposure to interweave reflection in all of their curricular areas. Even though the new structure is conducive to the concept of reflection in teacher education, yet much lies in the transaction process. To this end, even the inclusion of some specific course on 'reflection' could have been made a part of the new curriculum framework as is the case with multiple TEPs across the globe that put active efforts to engage their prospective teachers to understand various dimensions of 'reflection' as a concept. The understanding harnessed through such a course will not only help the student-teachers to start understanding the increasingly important concept of 'reflection' from different perspectives but also help them to put it into use in their own practice.

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Teacher Development in the Context of Constructivist Learning Using ICT

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Abstract
It has been established that educational resources made available through information and communication technologies (ICT) have the potential to enhance the effectiveness of the teaching-learning process. It follows that the teacher must have the competence to use these resources to provide students with constructivist learning environments. This paper puts forth suggestions for pre-service and continuing development of teachers so as to equip them to use ICT resources appropriately and on a sustained basis.

Introduction

The twenty-first century is one marked by technology use. All aspects of our lives have been touched by technology; how then can we expect education to be isolated from the impact of technology. It is but natural that this change will bring about a change in traditional methods of teaching and learning.

Contemporary education views the learning process as knowledge construction and not knowledge transmission. The role of the teacher is to provide students with authentic learning experiences. Learner must be given an opportunity to actively explore the learning environment, make intelligent guesses, verify them, authenticate the knowledge they have created and then socially negotiate a shared meaning from the learning.

Information and communication technologies (ICT) provide a means to offer the learner constructivist learning environments.(Khandpur & Husian 2006) The advantages ICT offer are numerous – they can present a simulated reality to students otherwise time-consuming, difficult or even impossible to access. Thus situated learning in

authentic environments is made feasible within the classroom itself. At the same time, they offer opportunities to predict and then verify the accuracy of the prediction. Through collaborative learning, students can negotiate meaning and reach a consensus on a common meaning.

Mention must be made of a peculiar characteristic of the contemporary educational scenario wherein the teacher is no longer the master of the content. The textbook and supplementary reading is no longer the only or even primary source of knowledge. Technology facilitates access by both the student and the teacher to a vast variety of sources of knowledge; it is no longer possible for the teacher to 'know' everything.

There is no saying when a child may learn or what. A child interested in a subject will learn about various aspects much before they are actually taught in school – in no way is such limited knowledge complete, but a teacher has to necessarily deal with a class of students with widely disparate entry behaviours. Often a teacher has to struggle to decide what takes precedence – a student providing inputs to a lesson that she herself was unable to provide or her control over the teaching-learning process. The term 'exceptional learner' is to now be supplemented with the term 'exceptionally well informed'.

It is not only technology that can facilitate learning in the new context. But technology can definitely play a role in changing the teaching-learning process from one controlled by the teacher to one where the teacher is also a learner. Thus there is a need to examine teacher development in the light of contemporary education.

It follows that the role of the teacher will be altered greatly. From being the purveyor of information, the teacher will become a collaborator in the process of learning. This is not to say that the teacher will become redundant – far from it since the teacher will necessarily have to guide the students in the process of learning, guiding them through the appropriate experiences and helping them authenticate their learning. Performing this new role will require new learning by the teacher, learning that can be provided through teacher education programmes, both pre-service and in-service.

It is axiomatic that the effective use of ICT in education will be determined by the ability of teachers to put technology to effective use. And this will be possible only when teachers have not only competence

in using the technology currently being used but also the confidence to use emerging and potential technologies.

Preparing Teachers for Facilitating Constructivist Learning using ICT

`ICT has been termed as a pedagogic tool by the National Knowledge Commission (NKC 2008). ICT can amplify the teacher's efforts at creating suitable learning environments for students, lending themselves to constructivist learning due to their inherent characteristics. The constructivist conditions for learning have been identified as: (Driscoll 1994)

- Providing complex learning environments that incorporate authentic activity
- Social negotiation should be an integral part of learning
- Juxtaposition of instructional content
- Access to multiple modes of representation
- Opportunities to nurture reflection
- Student-centred instruction

ICT offers all the above conditions. Interactive learning environments offer students the opportunity to 'see' reality they would not otherwise be able to. They get a chance to manipulate these environments in a manner they would be unable to in real life. If chosen by the teacher with care, these environments will be authentic representations of reality. Objections might be raised regarding the dangers of formation of alternative conceptions. While it has been seen that students might take a literal view of the representation, (Sutherland 2002) this danger is not peculiar to ICT alone; it can arise with any other representation of reality. This is where the role of the teacher becomes paramount – the teacher has to be aware of what comprises an authentic learning environment and should also be equipped with the skill of guiding students through the process of learning in such an environment.

Social negotiation must first take place with peers with the teacher as an observer, ready to intervene if needed. This in no way negates the role of the teacher; the teacher has to be alert to the formation of any alternative conceptions or the acquisition of partial understanding. On observation of any such tendency, the teacher must be quick to bring students back on track without imposing knowledge on them. This implies that the teacher has to be careful in allowing students to

construct their own knowledge while ensuring that the multiple learning paths they take lead to the same outcomes. It follows that the teacher must have experience of organizing collaborative learning experiences and a keenly developed sense for observing all that is happening in class.

Juxtaposition of instructional content helps in contextualization. The learning context is of primary importance for maintaining the focus of learning. It helps delimit the extent of exploration, a necessary condition for formal learning. The students are aware of why they are conducting certain activities, which helps them make sense of the learning experience. At the same time, if authentication is not forthcoming from the learning experience itself, they can seek it from the learning content. Again, it follows that the teacher should have the skill of juxtaposing the learning environment offered by ICT and the related text in such a way that verification is revealed as knowledge is constructed.

An overwhelming advantage offered by ICT is that they offer multiple modes of representation. Text, graphics, audio and visual representations of content are already available; the day might not be far when the tactile sensations, as for example offered by the joystick in games, may become more sophisticated and involve all the senses. It follows that the teacher must be aware of the scope offered by ICT in providing learning experiences which involve multiple representations as well as the source of obtaining these resources. They should also have experience of choosing these resources on the basis of certain criteria determined by the content and infrastructural support.

Reflection is an essential part of learning. Critical observation of one's learning process leads not only to the development of higher order thinking skills but also helps inculcate skills of self learning. Students can work independently or in groups using ICT and then discuss their experiences. Predictions can be made after working through the content on the basis of their observations and then verified. The teacher first and foremost should understand the importance of this aspect of learning. Providing experience of this kind of learning to the teachers themselves can help in the incorporation of this aspect in their own teaching.

Learning experiences designed using ICT are necessarily student-centred. Even if the teacher uses a single display screen to show an ICT resource to students, the focus can still remain on the students. It is but obvious that teachers should have some experience in using ICT in such a way that the student is at the centre of the teaching-learning process.

It is then axiomatic that the teacher should be empowered not only to assess the quality of available resources but also to prepare learning resources. This is possible if the teachers have some experience of user-friendly tools that can be used to create appropriate interactive environments.

The role of the teacher in the current scenario is that of a mentor providing cognitive apprenticeship. (UNESCO 2002) Essentially the teacher provides the learner with the opportunities to learn. Technological tools help mediate understanding and provide scaffolding when necessary. The teacher helps learners reach a consensus on the multiple interpretations they have and helps them negotiate a shared meaning free from errors. The teacher facilitates reflection among the learners and helps them identify their path to learning. Technology helps by providing appropriate tools and by facilitating both independent and collaborative study in interactive environments. The scope technology has in providing realistic simulated environments should expired again and again. However, at least till the attainment of maturity in ICT use in terms of a stable value system and awareness of the pitfalls of entering a virtual life, the teacher has to remain the guide.

Continuing Professional Development

Considering the dynamic nature of ICT, it is but obvious that teachers have to be continually updated with the latest in the field. While pre-service teacher preparation must inculcate a sense of confidence towards ICT use and an attitude of lifelong learning, it will be beneficial to institute a programme dedicated to updating in-service teachers in the latest technology and its use in education. The most feasible means to do this is through technology itself.

Various agencies have stressed the need for setting up a network of teachers for sharing information and resources.(NKC 2008, NCTE 2006, NCERT 2005, NCERT 2006) This concept can be extended to a form of ‘e-apprenticeships’ where an individual, either from the field of

education or from the software industry, dedicated to tracking emerging technologies with potential for use in education can update teachers not only on what is available but also provide an orientation to its use.

The concept of 'e-mentoring' can also be explored wherein teachers with a track record of viable use of technology in enhancing teaching-learning can mentor the learning of their peers.(Khandpur & Husain 2007) Links with individuals in the software industry dedicated to developing or modifying software for use in education will also help teachers keep themselves informed about how to enhance the teaching-learning process.

This kind of networking will also facilitate the evaluation of various ICT resources by building up a database of achievement using ICT, technical flaws in and advantages of a particular software, and so on. Also of importance is developing criteria based on the collective experience of teachers to be used for evaluating the suitability of a particular resource. One could carry this concept further and say that a site dedicated to the evaluation of available resources could be set up wherein teachers could select a particular resource on the basis of a synopsis collectively posted regarding its application and ease of use.

Teachers could also be encouraged to share the resources they have prepared. Not only will this build a library for all to share, it will also motivate them and help them obtain feedback on how to improve their work.

Face to face as well as online workshops must be arranged at frequent intervals for practicing teachers to enable them to renew their skills as well as learn new ones. It is axiomatic that incentives in terms of professional growth and recognition of their efforts must be forthcoming to keep teachers involved and motivated in the use of ICT for optimizing the teaching-learning process.

Discussion

The authors do not offer the premise that ICT are the only means to effective constructivist learning – they merely stress upon the fact that ICT can be one of the viable means of facilitating knowledge construction by students. And this is possible only when the teacher is also involved in the process of knowledge construction.

The path of learning a teacher follows in the use of ICT can be said to be a multi-stage one, from technology literacy to knowledge deepening to knowledge creation.(UNESCO 2008) Technology literacy involves basic competence in using technology, which can be categorized into use of basic word processing, powerpoint, e-mail communication, use of search engines, participation is discussion forums, and so on.

Knowledge deepening is the stage where a teacher can use visualizations like simulations, animations and the like, participate in virtual environments, use authoring tools to create content, and so on.

The stage of knowledge creation sees the teacher as capable of creating learning resources to suit the particular content to be transacted. This does not necessitate learning of software programming – the teacher should be able to use existing programmes to create interactive learning environments.

The only way to lead our teachers from the stage of technology literacy to the stage of knowledge creation is to provide them with the necessary experience with technology. Not only is it important that they be given an opportunity for guided use of ICT resources, they must also be given time to reflect on their experiences. Also, the learning cannot be limited to one instance – opportunities for learning on a continued basis must be institutionalized – the authors choose to use this word since this has to be done on a systematic and sustained basis.

For effective development of ICT resources, it is important that there be a link between the industry and education. While some may perceive this as dangerous in the sense that individuals involved in developing software for profit may use this opportunity for pushing their products, enough evidence exists that a tie-up leads to successful integration of technology by teachers. Teachers are best placed to explain the requirements they have from learning environments while industry players are best suited to create these environments.

Moreover the conviction is teachers. That need to promote ICT resources as it is worth the effort and cost. This conviction can arise only from observation of use of ICT and actual use of ICT. Demonstration of use of ICT by teachers recognized to have successfully incorporated technology in teaching-learning will enhance the understanding of teachers and motivate them further. Of equal importance is confidence in the use of ICT. This confidence can develop only through sufficient experience in using ICT.

Also of importance is development of the value of sharing – open educational resources need to be developed to be shared by teachers. This can be extended to resources for both school and teacher education. It might seem strange in today's competitive scenario to speak of sharing but we have to realize that if we want the best for our students as well as our practice of our profession, we must not only access resources used successfully by others but also share resources we have used successfully.

Above all, infrastructure to support learning in the use of ICT must be available in teacher education institutions, whether as part of pre-service education or in-service educational programmes. Sadly, this infrastructure is lacking in most institutions in India. A concerted effort has to be made to include not merely computers but reliable Internet connectivity in the infrastructure of teacher education institutions, as in countries like the UK, USA and other developed countries. The library should also have a collection of representative educational CDs. Demonstration lessons could be given by teacher educators, who should themselves serve as role models in the use of ICT.

Conclusion

The teacher has to be a seeker – of new tools and new environments using ICT to enrich teaching-learning. The teacher has to be a collaborator – in the construction of knowledge by students. The teacher has to a facilitator – not only of the learning of students but also of peers. The teacher has to be a creator – of new ways of representing knowledge. The teacher has to be a mentor – of students as well as peers. And finally, the teacher has to be a learner – constantly inventing and reinventing knowledge.

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Internet Attitude: A Study among Female Prospective Teachers

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Abstract

Internet has become a necessary part of daily life and it has peeped up in the field of education. It is an indispensable tool in hands of teachers and students to make educational world a global village by accessing reliable and valid information from any corner of world in few seconds. The main purpose of this study was to investigate internet attitude of female prospective teachers. Internet Attitude Scale developed by Zhang was administered on 82 female prospective teachers.. The data were analyzed by percentage, mean, standard deviation and t-test. After analysis of data it is concluded that 48.78 percent female prospective teachers have own computers. 36.58 percent female prospective teachers are mobile internet users and 20.73 percent female prospective teachers are daily internet users. The urban female prospective teachers showed higher internet attitude than rural female prospective teachers but no significant difference was found between science female prospective teachers and humanities female prospective teachers.

***Keywords**: Internet, Internet Attitude, Female Prospective Teachers.*

Introduction

Internet use is spreading rapidly into daily life and directly affecting people's ideas and behavior (Reddy & Karthik, 2013). The wind of internet has hit the educational scenario and made remarkable impact on contemporary educational system. The advent of technological gadgets and internet has changed the role and responsibilities of a teacher in modern educational world. It is demand of hour that a teacher should be techno friendly and capable to integrate technology in teaching-learning process. The internet has revolutionized the way student learns and how teachers teach in the classroom (Awoleyeet al., 2010). The internet is actually a network of computers over which any two computers located in different parts of the world can communicate.

Internet may be defined as a network of networks that are: interconnected physically, capable of communicating and sharing data

with each other and able to act together as a single network. Internet is an integrating force, has melded the technology of communications and computing to provide instant connectivity and global information services to all users at very low cost (Malhotra & Kakkar, 2012). Internet is a powerful tool to gather latest information about any topic and to communicate information with others in few fraction of time. It is an effective mean of communication between teacher and students. Browse the web, visiting school/college/university websites, e-newspaper, e-books, online discussion, watching educational videos, exchange of information; digital libraries etc. are some important uses of internet in education.

A review of literature revealed that Wallace, 2004; Laun, 2008; Awoleye et al., 2010; Tekerek & Ercan, 2012 conducted studies to explore teachers attitude towards internet while Mohammed & Karaki, 2008; Len-hart et al., 2010; Rehman et al., 2010 focused to analyze students attitude towards internet. Tekerek & Ercan (2012) explored that female teachers have positive attitude in use of internet for social interaction and communication. Most of teachers have their own personal computers and they connect to internet at home. Becker (1998) revealed that 90% of the teachers had Internet access. Luan et al., (2008) investigated 152 student teachers (80 female student teachers and 72 male student teachers) and founded that they exhibited positive attitude towards internet. Female student teachers spend as much time using the internet as their male counterpart. Awoleye et al., (2010) founded that teachers had developed a good level of expertise over time i.e. 70% with over 3 yrs experience in the use of some basic internet services, such as the use of e-mail, World Wide Web and various search engines. 88.6 percent teachers have access to internet, 49.8 percent teachers uses internet at cyber cafes, 54.4 percent teachers claimed to have internet access in their offices, and one out of five have internet connections at home. Malhotra & kakkar (2012) revealed significant relation and high correlation between internet knowledge and internet usage of teacher educators.

Objectives of Study

The present study was based on following objectives:

1. To study the profile of female prospective teachers. To study the internet attitude of female prospective teachers from rural and urban background.

2. To compare the internet attitude of female prospective teachers with respect to their streams i.e. Humanities and Science.

Hypotheses of Study

The present study was based on following hypotheses:

1. There exists no significant difference in internet attitude of urban and rural female prospective teachers.
2. There exists no significant difference in internet attitude of science and humanities background female prospective teachers.

Design and Methodology

The present study adopted descriptive survey techniques to collect the desired data. The sample for this study constituted 82 female prospective teachers enrolled in B.Ed. course in a teacher training institute of Kangra district of Himachal Pradesh. Purposive sampling technique was used for present study.

Tool Used

Internet Attitude Scale developed by Zhang was used to study the internet attitude of female prospective teachers. The tool consisted of 40 items which were positively worded. Some demographic questions were added to questionnaire to study the profile of female prospective teachers.

Analysis and Interpretation of Data

The data were analyzed by percentage, mean, standard deviation and t-test.

Table-1:The Profile of Female Prospective Teachers

Demographic Variables	Frequency	Percentage
Computer Ownership		
Yes	40	48.78
No	42	52.5
No Reply		
Place of Internet Usage		
Home (Dongle)	15	18.29
College	09	10.97
Café	02	2.43
No Reply	35	42.68
Mobile Internet	30	36.58
Internet Usage		
Daily	17	20.73
Weekly	13	15.85
Monthly	20	24.39

No Reply	32	39.02
Usage in Hours		
0-2 hrs	33	40.24
3-5 hrs	-	-
6-8 hrs	-	-
No Reply	49	59.75
Having E-Mail		
Yes	46	56.09
No	01	1.21
No Reply	35	42.68
Average Age	23.46 yrs	

As seen in the table-1, all the female prospective teacher participants are of average age 23.46 years. Only 48.78 percent participants have own computers whereas 52.5 percent don't have computers. It is found that 36.58 percent of participants are mobile internet users, 18.29 percent of participants use dongle for internet use, and 10.97 percent of participants use internet at college, but most of them (42.68 percent) did not respond to this question. As far as internet usage is concerned 24.39 percent participants use internet monthly, followed by 20.73 percent and 15.85 percent daily and weekly respectively. When the hours of internet usage were observed, it is concluded that 40.24 percent used internet for 0-2 hours while 59.75 percent did not reply. The table further reveals that 56.09 percent of participants had e-mail accounts, 1.21 did not have e-mail account while 42.68 did not reply.

Table-2: Mean and SD Scores of Urban and Rural Female Prospective Teachers on Internet Attitude Scale

Locality	N	Mean	SD	't'(df =80)
Rural	67	119.37	14.09	2.70
Urban	15	128.27	10.89	

A perusal of table-1, shows that a significant difference was found on internet attitude of urban and rural female prospective teachers. The urban female prospective teachers showed higher internet attitude than rural female prospective teachers. The probable cause for this may be that internet facility is still not available in rural areas.

Table 3: Mean and SD Scores of Science and Humanities Background Female Prospective Teachers on Internet Attitude Scale

Stream	N	Mean	SD	't'(df =82)
Science	27	123.29	14.33	1.03
Humanities	55	119.87	13.61	(N.S.)

NS: Non Significant

A close look of table-2, depicts that science female prospective teachers have scored higher mean value than humanities female prospective teachers but this difference is not significant. It may be because that female prospective teacher of both educational backgrounds is capable to use internet. The female prospective teachers of both backgrounds are familiar by the importance of internet in education.

Main findings of Study

- The first null hypothesis of no significant difference in internet attitude of urban and rural female prospective teachers is fully rejected. The urban female prospective teachers have scored higher scores than rural female prospective teachers. Therefore, the urban female prospective teachers have higher attitude towards internet than rural female prospective teachers.
- The second null hypothesis of no significant difference in internet attitude of science and humanities background female prospective teachers is retained. Therefore, female prospective teachers of both backgrounds i.e. science and humanities possess favorable attitude towards internet.

Discussion and Conclusion

The main purpose of this study was to examine the status of internet usage among prospective female teachers and the attitude of female prospective teachers towards internet. It is found that 48.78 percent of female prospective teachers were computer owners. Similarly Kutluca (2011) found 52.4 % of preschool pre-service teachers owned a computer and 99.2 % were regular computer users. Also Isman & Celikli (2009) observed that 64.3 percent participants have their own computers at home. The study further revealed that only 20.73 percent prospective teachers use internet daily. According to research, 40.24 percent female prospective teachers spent maximum 0-2 hrs on internet use. 56.09 percent female prospective teachers explored that they had e-mail accounts, on the other hand Ocak & Akdemir (2008) found that 47.6 percent teachers have e-mail accounts. The results further indicated that urban female prospective teachers possess higher attitude towards internet than rural female prospective teachers. As far as educational background is concerned, it was observed that the stream did not affect internet attitude of female prospective teachers. When the places of internet usage were examine, it was concluded that only 10.97 percent female prospective teachers use internet at college. The study

indicated that there is lack of internet use in college. It is need of the hour that the prospective teachers should recognize importance of internet in teaching-learning process. It can be done by organizing short term courses, workshops, guest lecturers etc. As per NCTE norms, there is ICT laboratory in every teacher training institution. The technicians and assistants should assist prospective teachers to access the internet. Becker (1998) concluded teachers (68%) used the Internet to find information resources for preparing lessons. A majority of the teachers with 62% response used Web search engines to find information resources. Thus proper use of internet to integrate in teaching-learning process is necessary for professional development of teachers.

Further the study revealed that 36.58 percent female prospective teachers were mobile internet users. The teacher training institutes should be connected to Wi-Fi facility so that more prospective teachers can access to internet on their mobiles and keep them updated. All the female prospective teachers are of average age 23.46 years. Young and energetic prospective teachers are the pillars of modern education system who have great potential to change the outlook of present education system. Thus, it is responsibility of teacher educators that they should utilize their capability and potential by giving proper training and guidance.

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A Study of Intelligence and Learning Curiosity towards E-Learning among Secondary Students

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Abstract

The present study explores the relationship between intelligence and learning curiosity towards e-learning among secondary students and also investigates gender wise differences regarding intelligence and learning curiosity towards e-learning. For achieving these objectives, descriptive survey method is employed. The sample is selected through simple random sampling method and total 80 students are selected, 40 male and 40 female students from the secondary schools of Agra city affiliated to the U.P. Board. Verbal intelligence test by R.K. Ojha & K. Ray Chaudhary (2006) and self-developed scale for learning curiosity towards e-learning are used. Pearson correlation and t-test are used as statistical techniques to analyse the data. The findings show that high correlation is found between intelligence and learning curiosity towards e-learning among secondary students. Findings also reveal that male and female students do not differ from each other regarding intelligence. It is also found that male secondary students have more learning curiosity towards e-learning than the female secondary students.

Introduction

The rapid pace of technological and economic developments has placed greater demands on education systems. The crucial need for students is to focus on the importance of lifelong learning, that is, to continuously upgrade their knowledge and skills, to think critically and to inspire creativity and innovation so as to adapt to global change (UNESCO, 2004). Recently, a new paradigm of teaching and learning process, e-learning, has emerged as a result of the rapid diffusion of ICT. It is widely believed that e-learning, if implemented properly, will empower all learners to fully engage in the 21st century.

It is well known fact that curiosity makes learning more effective and enjoyable. Curiosity can be defined as a state of arousal involving

exploratory behaviour, leads to thinking and thinking culminates in learning. Curious students not only ask questions, but also actively seek out the answers. Inculcating students with a strong desire to learn something is what every teacher lives for, and researches have even shown that curiosity is just as important as intelligence in determining how well students do in school. It can be said that curiosity prepares the brain for learning and it makes subsequent learning more rewarding. With intelligence, curiosity for learning is also playing a main role in learning process.

This is the digital age where more focus is on e-learning. Bookish knowledge is not the complete knowledge at present; more focus therefore, should be, on global learning and e-learning. E-learning also referred to online learning or virtual learning has been defined as a wide set of applications and processes such as Web-based learning, computer-based learning, Virtual Classrooms (VCR), and digital collaboration. It includes the delivery of content via Internet, audio- and videotape, satellite broadcast, interactive TV, and CD-ROM (Kaplan-Leiserson, 2000). However, in order to benefit from these advantages, both learners and educators will need to be able to adopt a new attitude towards e-learning models (Rozgiene et al., 2008). Therefore, it is important to study what learning curiosity towards e-learning is found among secondary students and is there any correlation between secondary students' intelligence and learning curiosity towards e-learning.

Research Background

The researcher has reviewed the literature focused on e-learning for the present investigation. Watson e. al., 2004; Cruthers, 2008 stated that the importance of e-learning is widely recognized as a mean to enhance accessibility and quality of teaching learning process. A wider range of students can be reached anytime and anywhere provided that the Internet connection is available, therefore increasing the number of school-age children who access to education system (Cruthers, 2008). The rapid development of ICT provides easier and more affordable connectivity to the Internet, thereby narrowing the digital divide, equitable access will continue to be a major concern to governments worldwide, even in developed countries. Common problems also indicated by previous studies regarding the new skills required that will enable learners and teachers to use and benefit from e-learning models (Picciano and Seaman, 2007; Rozgiene et al., 2008; Andersson and

Gronlund, 2009). Presumably, the more experience in using the computer and Internet, the more likely students and teachers will be inclined to accept and use e-learning style.

An e-learning readiness evaluation can help an organization to identify potential aspects that are necessary to ensure that the design of e-learning strategies tailored to meet learners' needs and how teachers and learners come to accept and use an e-learning style as well. Agboola (2006) also evaluate the awareness and perceptions of academic staff in using e-learning tools in a post-secondary institution in Malaysia. He found that e-learning training and e-learning confidence were of practical importance in predicting both e-learning adoption and e-learning readiness. So and Swatman (2006) examine how ready Hong Kong's primary and secondary school teachers are to accept and adopt e-learning. They found that respondents are not yet fully prepared to use e- learning technologies – with differences in readiness perceived between male and female; and secondary and primary school teachers; as well as between teachers from different secondary school.

After studying the literature, the researcher found that learning curiosity towards e-learning and intelligence were not considered in e-learning based previous research studies. Therefore, the researcher selected these variables for the present investigation.

Objectives

1. To study the correlation between intelligence and learning curiosity towards e-learning among secondary students.
2. To compare the intelligence gender wise among secondary students.
3. To compare the learning curiosity towards e-learning gender wise among secondary students.

Hypotheses

1. There exists no relationship between intelligence and learning curiosity towards e-learning among secondary students.
2. There exists no difference in intelligence between male and female secondary students.
3. There exists no difference in learning curiosity toward e-learning between male and female secondary students.

Research Method

The descriptive survey research method is employed to study the relationship between intelligence and learning curiosity towards e-learning among secondary students.

Selection of the Sample

Sample is selected through simple random sampling method. The secondary schools of Agra city affiliated to the U.P. Board are considered as population. From the population, 4 schools are selected randomly. 10 male and 10 female students were selected from each school, therefore total 40 males and 40 females are selected for the sample of the study.

Instrumentation

The researcher has used two research tools to collect the data. Verbal intelligence test R.K. Ojha & K. Ray Chaudhary (2006) is used to study the intelligence of secondary students. For measuring learning curiosity, self-developed scale for learning curiosity towards e-learning is used. Learning curiosity scale comprises 25 items with 5 point scale. For validating its content, content validity has been measured through experts' opinion. The content validity is 0.86 and Cronbach alpha reliability is 0.79.

Statistics

Pearson's r test and t-test as statistical techniques have been applied to analyze the data. The analysis of the data is as follows:

Table 1: Relationship Between Intelligence And Learning Curiosity Towards E-Learning

Variables	N	MEAN	S.D.	r
Intelligence	80	59.61	6.36	0.74
Learning curiosity	80	88.27	10.66	

Table1 presents relationship between intelligence and learning curiosity towards e-learning among secondary students. The extent of Pearson correlation is 0.74, which is showing high positive relationship between intelligence and learning curiosity towards e-learning. Therefore, the null hypothesis that "there exists no relationship between intelligence and learning curiosity towards e-learning among secondary students" is rejected. It can be said that if students' intelligence increases, their learning curiosity toward e-learning is also increases.

Table 2: Difference between Male And Female Secondary Students Regarding Intelligence

Gender	N	MEAN	S.D.	t-value	Level of Significance
Male	40	60.75	7.14	0.11	0.05
Female	40	58.47	5.31		

Table 2 presents gender differences regarding intelligence among secondary students. The calculated t-value (0.11) is less than the tabulated value (1.96) at 0.05 level of significance. It reveals that there exists no significance difference in intelligence between male and female secondary students. Therefore, the null hypothesis that "there exists no difference in intelligence between male and female secondary students" is accepted.

Table 3: Difference Between Male And Female Secondary Students Regarding Learning Curiosity towards E-Learning

Gender	N	MEAN	S.D.	t-value	Level of significance
Male	40	92.9	11.98	6.75	0.05
Female	40	83.65	6.56		

Table3 exhibits gender differences in learning curiosity towards e-learning among secondary students. At 0.05 level of significance, the t-value is calculated 6.75 which is higher than the tabulated value. Therefore, the null hypothesis that "There exists no difference in learning curiosity toward e-learning between male and female secondary students" is rejected. It means that regarding learning curiosity towards e-learning, gender difference exists. On the basis of the mean value, it can also be said that male secondary students possess more learning curiosity towards e-learning than the female secondary students.

Conclusion

E-learning is foremost demand of today's' educational era. Technological development is on its peak place; therefore it is necessary for each member of society to be familiarized from the use of digital devices, techniques and resources. It can be concluded that

intelligence is a leading variable which relates to students' learning curiosity towards e-learning. The results of the present study show that male students are more curious to learn via e-learning than the female students. Hence, it is evident that there is a need to make aware female students to adapt the education via e-resources. Females are equal part of society as man, therefore school teachers, administrators, and also government should prepare such programmes to enhance technological awareness among students for achieving national development.

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Understanding the Use of ICTs as Learning Resources at various levels of Education

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Abstract

The whole world has undergone massive changes; and the most common and prominent global providers and users of ICT tools and techniques are from some of the emerging economies such as Indian and China. Information flows and networks have spread across borders in ways that could not be imagined before the onset of the Internet, the global adoption of mobile telephony and social networks, and the rapid growth of broadband. With the emergence of digital India and other policy initiatives of Govt. of India, the ICT window is more broadened in all fields of education with the fast pace of ICT development. The present paper discusses about the radiant status, possibilities and glimpse of challenges towards using ICT tools and techniques at different levels of education including school education (elementary and secondary), non-formal education and inclusive education for making our education more effective as well as productive.

Introduction:

The latest and most advanced technologies in the arena of information and communication have amended the pace of the transmission of knowledge, workplaces, the world's economy and even socializing (Kelly, 2014). Today's children are spending their lives in a multitasking, multifaceted technology driven, diverse vibrant world, and thus they must be well equipped to do so effectively. Every day on campus, billions of messages are exchanged by the technology; students make thousands of presentations and opens endless web pages. Technology, whether Internet, software, email, integrated platforms, etc. has made considerable changes in the methods of teaching and study. The term ICT refers to forms of technologies that are used to create, store, share, transmit, and exchange information. This broad

definition of ICT includes such technologies as : radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing and electronic mail (MHRD, 2012).

There are several dimensions which distinguish the present ICT with the yester years that are integration of multiple medias, inter-capacity to control, manipulate and contribution to the information environment, flexibility of use, connectivity and aspects of the relevance of ICT in School education supporting new teaching methods, accessing remote resources, enabling cooperation, extending educational programmes and information literacy.

ICT as Learning Resources

ICT as learning resources is expanding in fast pace in education with broad arenas to study from mobile computing to animations or from E-mail to Skype. However, the advancements of ICT such as mobile learning, cloud computing, one-to-one computing, virtual learning, gaming, personalized learning, and teacher generated open content etc. should be more explored to find ICT as productive learning resources. Thus, use of internet services, interactive presentations, and presentations with images, videos, graphics and animations emerge to ameliorate and increase the attention of students in the classroom. It appears that the integrated platform is a tool that most popular among students when it comes to course websites. Students appear to appreciate these resources for several reasons, comprising rapid access to lecture notes and enhancing communication between students and their teachers.

In Indian context, the concrete example can be One Stop Education Portal 'SAKSHAT', the helpline which take care of all the needs of the entire learning community including the students enrolled in various educational institutions and lifelong learners by extensively utilizing e-learning concepts and the ICT based methodology. Furthermore, the establishment of Three National Resource Centres on Standardization and Quality Assurance for E-learning Content for three sectors of education such as (a) non formal, school and High School sector; (b) College & University Education Sector; and (c) Engineering & Technology Education Sector may change the educational environment of the country (MHRD, 2012).ICT as learning resources at School Education level

The use of ICT has shown a positive impact on achievement in all subject areas and across all levels of school. The use of ICT makes instruction more student-centered, encourages cooperative learning, improves student attitude and stimulated increased student teacher interaction. Studies have further strengthened that inquiry based analytical skills, critical thinking, data analysis; problem solving and independent thinking develop when there is rightful and judicious use of ICT. The 'National Policy on ICT in School Education' focus on ICT use in School Education to devise, catalyze, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality, and efficiency in the school system. The potential of ICT is to beneficially leverage to disseminate information about and catalyze adaptation, adoption, translation and distribution of sparse educational resources distributed across various media and forms. Furthermore the policy emphasized the need to digitize and make available educational audio and video resources, which exist in different languages, media standards and formats. The policy recommended a nationwide network to be established in which schools, teachers, students, school managers, and the communities at large participate. This implementation will include the School Management Information Systems (School MIS); digital repositories of tools, content and resources; professional development and continuing education platforms; and guidance, counseling and other student support services (MHRD, 2012).

Elementary Education

Education leadership, management, and governance can also be improved through ICT by enhancing educational content development and supporting administrative processes in schools and other educational establishments (ICT in School Education Report, 2010). Based on the goals of National Policy on ICT in School Education and National Curriculum Framework, Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT) have developed a three-year ICT in Education course for students of Classes VI-XII. The Department of Education, Government of Delhi, has developed a comprehensive and functionally effective Web-based and GIS-based Management Information System (MIS) on which all the schools, zonal offices, district offices, regional offices, and various branches at the headquarters can share information using the Web-enabled software. Information for all stakeholders—

students, teachers, and administrators—is available online through the Directorate's Web site (edudel.gov.in); this includes information on admissions, mark sheets, teacher attendance, transfers, pay slips, and so on (ICT in School Education Report, 2010).

Secondary Education

The elective courses at the higher secondary level will be modular in design to enable students to select appropriate software applications based on current needs of higher education and job prospects (MHRD, 2012). In this direction, recently, the three-year ICT in Education course by NCERT for students of Classes VI-XII from 2014-15 sessions is a step forward to enhance the quality of secondary education. The ICT in Schools Scheme was launched in 2004 to provide opportunities to secondary stage students to mainly build their capacity on ICT skills and make them learn through computer aided learning process. The Scheme is a major catalyst to bridge the digital divide amongst students of various socio economic and other geographical barriers. The Scheme provides support to States/UTs to establish computer labs on sustainable basis. It also aims to set up smart schools in Kendriya Vidyalayas and Navodaya Vidyalayas which are pace setting institutions of the Government of India to act as ―technology demonstrators and to lead in propagating ICT skills among students of neighborhood schools. The scheme currently covers both Government and Government aided Secondary and Higher Secondary Schools (MHRD, 2012).

ICT as Learning Resources at Higher Education Level

ICTs have provided the facility of access to diverse, open and often free information. It is even said that ICT has kept students to go deeper in their learning (Kelly, 2014). EDUSAT is the satellite exclusively devoted to meet the demands of educational sector. It was launched in 2004 by Indian Space Research Organization (ISRO) to meet ever increasing demand for an interactive satellite-based distance education system for the country. It has revolutionized classroom teaching through IP based technology. Consortium for Educational Commission (CEC) is one amongst the five primary users of this educational satellite. At present, there are over hundred Satellite Interactive Terminals (SITs) and Receive only Terminals (RoTs) under CEC EDUSAT network, installed at various colleges, Academic Staff Colleges and Universities across the country. The students can interact and ask questions using the audio video conferencing live, text mode or

through telephones. Since technology is fast changing the way we think about communication, the potential of using tools like Skype for long distance academic collaboration should be explored. In addition, National Higher Education Mission by MHRD (2013) recommended that young and mid-level faculty must be given opportunities to go abroad either on short term teaching assignments or research or syllabus formation projects.

A proper balance between content generation, research in critical areas relating to imparting of education and connectivity for integrating our knowledge with the advancements in other countries is to be attempted as recommended by MHRD (2012).

ICT as Learning Resources in Non-Formal Education

The opportunity of access, affordability and convenience are offered by the Distance Education system, but it was plagued by the rigidities of the conventional system. The only flexibility was with regard to the larger number of seats. Education was still out of the reach of the marginalized and the disadvantaged. It was realized that unless we open educational opportunities to the deprived, remove the structural rigidities in our educational system and integrate the educational system with developments in communication technology, we cannot and will not make headway in realizing the uphill task of educating majority of the people and of catering to the diverse types of education that a modern society demands (UGC, 2013).

It is no longer necessary for teachers and students to be physically in proximity, due to innovations of technologies such as teleconferencing and distance learning, which allow for synchronous and asynchronous learning. All Open and Distance Learning Systems will be automated and provide online, all services including admissions, examinations, e-Accreditation and grievance redressal on the lines of the National Institute of Open Schooling. Online courses, online on demand exams, and digital repositories and content, media broadcasts planned through DTH/Satellite based, open learning systems allowing multiple entry and exit points, opening out the school resources to non-formal students, guidance and counseling, will result in effective use of ICT for open and distance learning.

ICT as Learning Resources in Inclusive Education

ICTs offer a great potential to support lifelong learning for all groups of students, including those who have special educational needs. The

application of ICTs must enhance independence, integration, and equal opportunities for such people and in this way will facilitate their inclusion in society as valued, respected, and contributing members (UNESCO-IITE, 2008).

Under the ICT literacy and Competency Enhancement, the National Policy on ICT in School Education of MHRD (2012) suggested that use of ICT will catalyse the cause and achieve the goals of inclusive education in schools. ICT software and tools to facilitate access to persons with disabilities, like screen readers; Braille printers, etc. will be part of the ICT infrastructure in all schools. On one hand, Special care will be taken to ensure appropriate ICT access to students and teachers with special needs. On the other hand, all teachers will be sensitized to issues related to students with special needs and the potential of ICT to address them. All capacity building programmes will include components of ICT enabled inclusive education. Digital content and resources, for the exclusive use of persons with disabilities, talking books for example, will also be developed and deployed. Efforts will be initiated to develop appropriate word lists and dictionaries in Indian languages and wide spread translations encouraged. Technology can offer exciting multimedia and interactive learning to children, especially for those who need extra support for their learning.

Challenges of Using ICT as Learning Resources in Education

India is rated high on appreciation because it has gone beyond policies that merely recognize the strategic role of ICT for growth and development and is already institutionalizing concrete measures that support ICT initiatives. However, it has been rated low on availability of technology due to many reasons. Students from rural locations or impoverished communities do not have even basic access to ICT. Given that a number of schools still do not even have appropriate classrooms, computers, telecommunication facilities and Internet services; ICT continues to be a distant dream. The existing shortage of quality teachers further compounds the problem (ICT in School Education Report, 2010)

However, university teachers do not have much personal experience of online learning. However several other reasons are also often cited as challenges of ICT in teaching and learning such as lack of understanding of the technologies available, the belief that e-learning is a poor alternative to face interaction, the growing perception that

students are paying for and therefore want a face experience and, perhaps most critically, insufficient time for staff to not only understand the technologies available but to really think about how best to incorporate the effective practice emerging into their own teaching context (Oradini & Saunders, 2008). Finally to network effectively, a lot of time must be put into creating networks, sharing information and finding other people to communicate with.

Conclusion

The time has come that ICT in education is something which is more than 'nice to have'. It is to be re looked as 'must have'. It is clearly about methodology not just tools, and it needs to be not about products, it needs to be more about practices. However, the role of teacher is nowhere going to diminish rather it is going to be supported with digitalized backup. To bridge the access gap, new models of content creation, content delivery, learning, management and planning mechanisms, monitoring and evaluation system for creating cooperative and self-learning environment have to be developed. The e-content needs to be developed and translated in regional languages to improve grasp and enhance learning in all spheres of education. Because today's young people are hooked up and plugged in all of the time, it is important that teachers find a way to engage them on a technology level. Technology in the classroom is doing just that-keeping students stimulated by using the latest and greatest inventions in computers and digital media. Overall, ICT has really improved the educational system across the globe.

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Information and Communication Technology: Potential Role in Education and Language Teaching – Learning

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Abstract

Today we all are in living in the global world and to remain connected with information all around, ICT plays a vital role. The influence of ICT has dramatically knocked and touched every sphere of our living environment from T.V to Internet to computer. To perform a very simple task, we are totally dependent on technology. ICT is one of the basic building blocks of modern digital society. Even our academic world could not remain untouched from the influence of technology. Education has power to shape the society and it is the Language which shapes and shaped by the Education. Thus Language teaching has always remained the area of concern for educationists and educational planners. For a long time meaning of Language has just remained limited to means of communication only and Language teaching and learning is considered as technical task. With the passage of time educational reforms resulted in new teaching methods and tools. Time has changed from the use of teachings aids to ICT. The present picture of our education system is learner centered where a teacher has to pay more attention towards the student. Since student and teacher are two key elements of teaching-learning process, if teacher is mansion than students are the basic blocks. But there are various challenges to integrate ICT in education and foreign/Second language teaching and learning. Educators and researchers are examining the new ways to integrate ICT into the curriculum. There is no one best way to educate individuals and learn a foreign/Second language nor a single optimal set of teaching materials. The reason behind is the variability among the learners in their learning as how they learn and want to learn. ICTs to support language learning for all pupils and across all ages has no specific and a single shot bullet solution for the query. ICT plays number of key roles in Foreign/Second Language teaching-learning. The present paper is first addressing what the ICT in

Education is and than discusses the varied roles of ICT in Foreign/Second Language teaching-learning.

Key Words: *ICT, Foreign/Second Language, Teaching and Learning*

Introduction

We are living in a digital era and technology has made a tremendous impact on our life. Today with the change in time one can see a tremendous shift in human behaviour; the way of human thinking. In Ancient time human life revolved around religion, farming and trade but emergence and growth of Information Technology completely changed the outlook of human life into a world with thoughts of creativeness in information storage and management. The evolution of technology has developed our society leading it to digital era. Globalization and technological change—processes that have accelerated in tandem over the past fifteen years—have created a new global economy "powered by technology, fuelled by information and driven by knowledge."(US Departmet of Labour,1999). In the present time those who are not well versed with ICT find themselves illiterate in this digital era. Information and communication Technology can be used, " to communicate, to store, disseminate and managing the information by the use of diverse set of tools and resources" (Blurton,2011)**.** Information and communication technology means transmission of information by the use of technology which include Radio, Television as well as new digital technologies as computer and internet. Appropriate use of technology provides access of information easily which is not confined to the four walls of learning institutions rather it open the door of information for all by connecting us to other network completely breaking the isolation and makes the accessibility of information at the doorsteps.

Education has undergone many changes. In recent years the education reforms have emphasized the need for integrating technology into teaching-learning process. The inclusion of technology has given new dimensions to education. The rapid growth in the development of technology has laid greater emphasis on digital literacy. For which one has to be Digitally Literate to cope up with the modern digital world. The effective use of ICT is not a cup of tea as it requires the use of technology and capital in teaching-learning process. By making education digital oriented, the teaching has to move away from traditional method to multi-platform digital strategies. The digital

learning tools include use of computer, mobile application, e-learning, blended learning, internet, learning game etc. New technologies are significant as they work on the principle of individual differences, it considers that every individual has its own individuality and he/she works according to their own pace. In traditional classroom, a teacher has to deliver his content as well as to look over the need of every student which became sometime stressful to handle the situation but with the inclusion of these technologies in education it has became easier to deal with such situation.

Teacher is a guide or mentor and he has to guide his students in various spheres of education so it is necessary that the teacher must be familiar in using various ICT equipments in teaching-learning process. ICT has the power to refine our teaching-learning process when we have the knowledge How, When and Where to use technology so as to accelerate the pace of the child. When well equipped technology is used in the field of education it adds a new quality dimension, it enhances teacher-learning process by adding a sophisticated look to the traditional teaching method. ICT adds value to the learning process (UNESCO, 2002) . A teacher plays an important role in integrating ICT in teaching-learning process. ICT acts like a catalyst and adds quality to teaching by increasing the perception of students. Studies have shown that an appropriate use of ICT can raise educational quality and connect learning to real-life situations (Lowther, et al. 2008; Weert and Tatnall 2005). Technology has made new horizon, it has made us to fly as it has increased the quality in education.

Research Questions

- What is ICT in Education?
- What is the potential role of ICT in Foreign/Second Language teaching and learning?

Education and ICT

The initiation of education process begins in the womb of mother. The human being in his/her life is educated through formal as well as informal ways. Education is the process to develop and nurture the new sibling. As our Upanishads have said that "*Sa Vidya Ya Vimukta*" which means that Vidya has a supreme power in itself as it elevates you from the bondages or chains and make your soul liberated as it figure out a picture in front of you that what do you think about reality and what is reality. Information and technology has made a tremendous

change in refining our educational system. In last few years technology has entered every sphere of life or we can say that no one is untouched by the use of technology in every sphere of life. Initially, television and radio came into our life they were the initiator for breaking the barriers of isolation and introducing us to the world of information. The impact of technology was so much that even our academic world could not get rid by the influence of the technological revolution that later became bench mark in the history by introducing the art of printing and writing(Kabir,2013). It has made the expansion in the education by making it a active process not a passive one. Its introduction in education system has globally attached us. ICT has added a new power to the education by driving us to the world of information and making a new education economy by allowing easy access to the information world (US, Department of Labour 1999).

ICT and Teacher

As Schiller & Tillett (2004) said "ICT enhances what is possible by amplifying what teachers are able to do, by providing an entry point to content and enquiries that were not possible without the use of ICT, by extending what students are able to produce as a result of their investigations, and finally by providing teachers with the opportunity to become learners again." Use of ICT in classroom has redefined the role of teacher with new attire where he confronts the students with new problems. ICT has made the age of the 'borderless' provision of education (THES, March 2000) it shed all the geographical barriers. ICT has refined the role of teacher in the classroom. Steve,2001 has a option that ICT based classroom has changed the role of teacher in following three ways: Firstly, it has helped the teacher to meet the student needs of leaner in non-linear pattern rather than in linear way in which there is sender and receiver. ICT based classroom is facilitated with more information which let the leaner indulge in problem solving activity. Secondly, teachers in ICT based classroom are only to share the content knowledge but they involve the leaner into critical thinking which is full of information literacy. Thirdly, a teacher in ICT environment can make the use of on-line test, computer test and make the assessment of student.

ICT and Student

A student learns on his own pace taking his own time that it adds to the quality to his education as it allows the learner to learn how he want to learn, what he want to learn, where he want to learn which makes him

free from stress and allow him grasp the knowledge the way in which he wants.ICT has brought a digital revolution to Education by making the use of various digital technologies i.e. computer, mobile devices, digital media, social networking sites.

What ICT Brings to the Classroom

ICT adds value to the processes of learning, and in the organization and management of learning institutions (UNESCO, 2002). ICT brings benefits to both teacher and learner as a tool in the hands of teacher it enhances the quality of teaching and for learner it helps him to learn and store lot of information. ICT in the classroom promotes on the principle of self-learning, collaborative learning and sharing of learning space. It provides access, storage and dissemination of information. It helps the learner to move accordingly to their own pace. ICT creates a environment where the learner can share, communicate and access their material. Students will be able to direct their own studies to a greater extent, with the teacher acting as a guide or moderator rather than as a director (Forsyth, 1996: 31).

Teaching Languages Today: Why Use ICT in Language Teaching & Learning

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 (Garret, 1991).

Life style has changed and pace of life has increased with greater mobility of society due to development of high technologies. Almost in all spheres of human life, modern technologies have penetrated and education being one of them. The degree of learner independence in the existing forms of technology assisted language learning varies; this guide deals with just one type of technology assisted learning – blended learning

While using ICT for teaching and learning is no exception as in any wide-scale process, one has to consider the whole package of benefits it offers and problems it pose. Either in professional life or in studies today, we can hardly imagine doing without high-tech gadgets. ICT has been used in language learning for several decades now; the growing numbers of learners require relevant feedback from professionals who get involved in tutoring, who use one or another form of ICT assisted studying.

Potential role of ICT in Teaching Foreign / Second Language

From 19th century various approaches have been adopted for Foreign/Second Language teaching and learning. These approaches and methods include audio lingual approach, natural approach and communicative approach, Grammar-translation method, direct method etc. These all approaches and methods treated language teaching as technical task of delivering the knowledge of codes and symbols and to teach the rules of the grammar. However there is not a single best way or single optimal set of teaching materials for Foreign/Second Language Teaching and Learning. This is due to the fact that needs and requirements of the learners vary with time and space. Therefore it cannot be said that ICT can provide a single 'Magic Bullet' that can support Foreign/Second language learning for all pupils and across all ages.

However, there are number of key roles that ICTs have the potential to fulfill in Foreign/Second Language teaching and learning:

1. Enabling information and resource sharing between teachers and learners:

The internet can function as a powerful tool for language teachers; by enabling them to create and share their own resources and models of good practice, by creating databanks of games and tests that can be used by other teachers, and by offering lists of ESL resources in target languages that can be shared.

2. Extend language learning across institutions and outside formal educational contexts:

Through video and e-mail links with schools in country and with other countries, ICTs can offer real opportunities to use languages with native speakers; through personalised and mobile devices, and through home access to the internet, ICTs can offer learners the opportunity to practise languages outside the languages classroom.

3. ICT as motivator to learn languages:

ICTs, through games and other digital media, through offering 'real and relevant' opportunities for linking with real language learners (through the internet/video-conferencing), through providing access to relevant and engaging materials (through access to foreign language entertainment and information sources), can provide increased motivation for learners of all ages to acquire and use languages.

4. Opportunities for maximal progress in language acquisition through responsive diagnostic and feedback systems

Languages may be one of the only areas in which the Computer Assisted Learning Paradigm is still acknowledged as being of some merit, as the aspects of progressive language acquisition key to language learning can be practised through drill and test systems. These enable learners to practise languages in an environment free from embarrassment where they can work at their own pace. These environments also offer instant feedback on success, diagnostic testing of abilities and encourage learners to manage their own learning.

5. Offering opportunities for meaningful practice of language in authentic contexts.

Before the arrival of the internet, e-mail and video-conferencing, the only way of practicing language in context was through expensive school visits or through the telephone. ICTs offer opportunities for practicing language in context with real native speakers in all four skills areas (reading, writing, listening and speaking) in ways that would have been impossible before.

To achieve all of the above activities, without access to ICTs is not only difficult, but highly costly, and has, historically, tended to exclude all but children culturally and socially pre-dispositioned towards language learning.

Conclusion

From the above, we can conclude that ICT is a powerful tool as it acts as a catalyst when used in a proper way adds quality to our education which has its effect both on a teacher and a student because technology in and of itself will not provide a solution to the problem. ICT enhance the quality of teaching and learning process (Voogt & Pelgrum, 2005; Watson, 2001; Well-Strand, 1991) and also plays important roles in Foreign/Second Language Teaching and Learning. But that does not mean we can forget the contribution what teachers has done for the education without the use of ICT but the point is that what can happen when we use a good source which became a good resource i.e. is ICT. So ICT in education have the capacity to refine the teaching-learning process.

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Sensation Seeking among Visually Impaired and Sighted Under-Graduate Students: A Comparative Study

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Abstract

The study compared the sensation seeking of visually impaired and sighted undergraduate students. The sample consisted of 85 male students (35 visually impaired and 50 sighted students) from different colleges of Panipat, Kurukshetra, Ambala and Chandigarh. The researchers used descriptive survey method and purposive sampling for the present study. Adapted version of sensation seeking scale developed by Marvin Zuckerman was used for collection of data. Data obtained were analyzed using descriptive statistics like Mean, Standard Deviation, and t-test. Findings don't indicate any significant difference in the sensation seeking of visually impaired and sighted undergraduate students. Furthermore, dimension wise comparisons of sensation seeking reveal a significant difference in the experience seeking and boredom susceptibility of visually impaired and sighted students. Sighted students have high level of experience seeking than their visually impaired counterparts. Where as visually impaired students have high level of boredom susceptibility than their sighted counterparts. Significant difference was not found in the disinhibition of visually impaired and sighted under-graduate students. Implications for visually impaired students specifically were suggested

Youths nowadays are indulging themselves in more risk taking behaviours, sensation seeking, impulsivity, an inability to cope with obstacles and handle one's emotions, and heightened aggression as being linked to risk taking (Cooper & Wood, 2003). Risk taking behaviour and sensation seeking are found to be highly correlated. Individuals who tend to engage in risk taking tend to have high score on measure of sensation seeking (Zuckerman & Kuhlman, 2000). According to Zuckerman (1994), "sensation seeking is a trait of temperament defined by the need for varied, novel and complex sensations and experiences and willingness to take physical, social

legal and financial risks for the sake of such experiences". Sensation seeking predicts an open, receptive attitude towards experience and the ability to tolerate sensations and ideas that are unusual, strange and primitive.

Sensation seeking is a stable personality trait, studied in the psychology literature, which varies across individuals. The trait generates behaviours in many arenas that are less frequently observed among those endowed with lower degree of sensation seeking trait; these include risky driving, risky sexual behaviour, frequent career changes, drug and alcohol abuse, participation in certain type of sports and leisure activities. Their drive for stimulation may blind them to certain dangers. As a result "high sensation seekers are more likely to enter into risky situations and low sensation seekers are more likely to avoid them". Sensation seeking is not abnormal trait. Most high, medium or low scores don't develop mental disorders. It may play a role in determining the type of disorder, but does not produce or preclude mental illness.

Educational Trends related to the Problem

It has been noticed especially in metropolitan cities that school students from the tender age of thirteen are drinking alcohol and using drugs. This is not an unusual story nowadays. Why are some kids more likely to engage in high risk taking behaviours at such a young age while other kids are busy doing home work and participating in after school sports (Lubliner, 2003)? Such type questions motivate the researchers to come forward and investigate the fact. Multiple studies report such personality features as

Incidents of extreme behaviors performed by a few adolescents have left authorities essentially one negative and increasingly severe response towards most adolescents: punishment. Society in general and education in particular, has backed itself into a corner when dealing with behaviours by adolescents who opt to behave negatively. If the educational environment for most teenagers has changed over the last few decades, it has become more punitive. There may be less tolerance of disruptive behaviours. In *The Romance of Risk: Why Teenagers Do the Things They Do*, Ponton (1997) refuted the traditional idea that risk-taking (sensation seeking) is primarily an angry power struggle between teenagers and their parents and redefined it as a testing process to find out who they are. In addition, adolescents' social, psychological, and biological stresses may lead to behaviours that, while defined as

dangerous by adults, may not be perceived as such by teenagers. Attention-seeking students once considered class clowns are stifled. Findings by Nelson (1992) concluded that punishment may not be appropriate since revenge or torment is not the reason for the student's behaviour. Instead the class clown prefers novelty, risk, complexity, flexibility, etc. According to Nelson, an educational environment appropriate for these sensation seekers would emphasize not punishment, but a fast-paced, discovery learning program encouraging creativity. A few years ago, many of the young people who would not or could not comply with the traditional educational regimen were expelled or simply encouraged to drop out of school. Present educational policy mandates that schools make concerted efforts to matriculate all students within the general education program, even those with behaviour problems. In USA since the 1975 passage of the Education for All Handicapped Children Act (PL 94-142), specific resources have been allocated to retain the very students that exhibit behaviours once severe enough to have them removed from school. While a particular student may qualify for special education services under the current (2004) federal Individuals with Disabilities Education Act and receive some form of intervention, accompanying regulations require extensive procedures that leave many school administrators feeling their disciplinary options have been inexorably curtailed. Coupled with the resulting hesitation of administrators to refer students and the introduction of more stringent eligibility requirements, fewer special education students are being identified as behaviourally disturbed, relegating them to the traditional punishment regime.

Justification of the Studies

Sensation seeking is an important variable to measure the new stimulation of adolescents. It is reported that sensation seeking is related to an impulsive type of extraversion, non-conformity, unconventionality and negative social norms. It is also found to be associated with adolescence. Though explicit and extensive researches related to persons with disability are found but areas like sensation seeking is almost unexplored, indeed. A little numbers of researches are found on sensation seeking of Attention Deficit Hyperactivity Disorder (ADHD) but other areas of disability are yet to be investigated. Taking all these facts into consideration the investigator makes an attempt to study sensation seeking of visually impaired and sighted under-graduate students.

Objectives of the Study

1. To investigate the sensation seeking of sighted under-graduate students.
2. To investigate the sensation seeking of visually impaired under-graduate students.
3. To compare the sensation seeking and its three dimensions (disinhibition, experience seeking and boredom susceptibility) of sighted and visually impaired under-graduate students.

Hypothesis of the study

There exists no significant difference in sensation seeking and its three dimensions (experience seeking, boredom susceptibility and disinhibition) of visually impaired and sighted under graduate students.

Method

Participants

Keeping in view the limited resources of time, money and practical difficulty a limited sample of 85 under-graduate students (35 visually impaired and 50 sighted students) was selected purposively from Ambala and Panipat districts of Haryana.

Measures

In the present investigation the researcher used the adapted version of Zuckerman Sensation Seeking Scale. The Scale was adapted by the investigators for collection of the data. The scale consisted of 25 items, each to be rated on two options yes or no. The Scale consists of both positive and negative items. The items relate to three dimensions i.e. disinhibition, boredom susceptibility and experience seeking. The original Scale of Zuckerman includes another dimension called thrill and adventure seeking. This dimension of the original scale of Zuckerman was excluded in the adapted version according to the nature of the sample. The reliability of the whole test came out to be 0.71.

Results

1. Analysis of First Objective

First objective of the present study was to investigate the sensation seeking of sighted under-graduate students. This objective has been analysed in the following way.

Table- 1 An Overview of the Sensation Seeking of Sighted Under-Graduate Students

Level of Sensation	Seeking and Score	Frequency	Percentage
High	(Above 18.40)	13	26
Moderate	(Between 15.88 to 18.40)	23	46
Low	(Below 15.88)	14	28
Total		50	100.0

From table 1 it is clear that out of 50 sighted under-graduate students 13 students i.e. 26% who score above 18.40 are high sensation seekers, 23 students i.e. 46% who score within 15.88 to 18.40 are moderate sensation seekers, 14 students i.e. 28% who score below 15.88 are less sensation seekers.

Table 2- An Overview of the Disinhibition of Sighted Under-Graduate Students

Level of Disinhibition and Score	Frequency	Percentage
High (Above 7.23)	11	22
Moderate (Between 5.93 to 7.23)	28	56
Low (Below 5.93)	11	22
Total	50	100.0

Table 2 depicts that out of 50 sighted under-graduate students 11 students i.e. 22% who score above 7.23 have high level of disinhibition, 28 students i.e. 56% who score within 5.93 to 7.23 have moderate level of disinhibition, and 11 students i.e. 22% who score below 5.93 have low level of disinhibition.

Table 3- An Overview of the Boredom Susceptibility Sighted Under-Graduate Students

Level of Boredom Susceptibility and Score	Frequency	Percentage
High (Above 3.87)	22	44
Moderate (Between 2.33 to 3.87)	6	12
Low (Below 2.33)	22	44
Total	50	100.0

Table 3 shows that out of 50 sighted under-graduate students 22 students i.e. 44% who score above 3.87 have high level of boredom susceptibility, 6 students i.e. 12% who score within 2.33 to 3.87 have moderate level of boredom susceptibility, and 22 students i.e. 44% who score below 2.33 have low level of boredom susceptibility.

Table 4- An Overview of the Experience Seeking of Sighted Under-Graduate Students

Level of Experience seeking and Score	Frequency	Percentage
High (Above 7.79)	24	48
Moderate (Between 7.13 to 7.79)	0	0
Low (Below 7.13)	26	52
Total	50	100.0

Table 4 shows that out of 50 sighted under-graduate students 24 students i.e. 48% who score above 7.79 are high experience seekers and 26 students i.e. 52% who score below 7.13 are less experience seekers.

2. Analysis of Second Objective

Second objective of the present study was to investigate the sensation seeking of Visually Impaired under-graduate students. This objective has been analysed in the following way.

Table 5- An Overview of the Sensation Seeking of Visually Impaired Under-Graduate Students

Level of Sensation Seeking and Score	Frequency	Percentage
High (Above 19.09)	9	25.71
Moderate (Between 16.23 to 19.09)	15	42.86
Low (Below 16.23)	11	31.43
Total	35	100.0

From table-5 it is clear that out of 35 visually impaired students 9 students i.e. 25.71% who score above 19.09 are high sensation seekers, 15 students i.e. 42.86% who score within 16.23 to 19.09 are moderate sensation seekers, 11 students i.e. 31.43% who score below 16.23 are less sensation seekers.

Table 6- An Overview of the Disinhibition of Visually Impaired Graduate Students

Level of Disinhibition and Score	Frequency	Percentage
High (Above 7.42)	12	34.29
Moderate (Between 5.66 to 7.42)	14	40
Low (Below 5.66)	9	25.71
Total	35	100.0

Table 6 depicts that out of 35 visually impaired students 12 students i.e. 34.29% who score above 7.42 have high level of disinhibition, 14 students i.e. 40% who score within 5.66 to 7.42 have moderate level of disinhibition, and 9 students i.e. 25.71% who score below 5.66 have low level of disinhibition.

Table 7- An Overview of the Boredom Susceptibility of Visually Impaired Under-Graduate Students

Level of Boredom Susceptibility and Score	Frequency	Percentage
High (Above 4.89)	15	42.86
Moderate (Between 3.51 to 4.89)	11	31.43
Low (Below 3.51)	9	25.71
Total	35	100.0

Table 7 shows that out of 35 visually impaired students 15 students i.e. 42.86% who score above 4.89 have high level of boredom susceptibility, 11 students i.e. 31.43% who score within 3.51 to 4.89 have moderate level of boredom susceptibility, and 9 students i.e. 25.71% who score below 3.51 have low level of boredom susceptibility.

Table 8- An Overview of the Experience Seeking of Visually Impaired Under-Graduate Students

Level of Experience Seeking and Score	Frequency	Percentage
High (Above 7.56)	14	40
Moderate (Between 6.26 to 7.56)	8	22.86
Low (Below 6.26)	13	37.14
Total	35	100.0

Table 8 shows that out of 35 visually impaired students 14 students i.e. 40% who score above 7.56 are high experience seekers, 8 students i.e. 22.86% who score within 6.26 to 7.56 are moderate experience seekers, and 13 students i.e. 37.14% who score below 6.26 are less experience seekers.

3. Analysis of Third Objective

Third objective of the present study was to compare the sensation seeking of Sighted and Visually Impaired under-graduate students. This objective has been analysed in the following way.

Table 9- Comparison of Sensation Seeking of Visually Impaired and sighted Under-Graduate Students

Dimensions	Group	N	Mean	SD	't' value	Level of significance
Disinhibition	V.I. students	35	6.54	1.77	0.11	Not significant
	Sighted students	50	6.58	1.31		
Experience Seeking	V.I. students	35	6.91	1.31	2.29	Significant at 0.05 level
	Sighted students	50	7.46	0.68		
Boredom Susceptibility	V.I. students	35	4.20	1.39	3.43	Significant at 0.01 level
	Sighted students	50	3.10	1.56		
Total Sensation Seeking	V.I. students	35	17.66	2.86	0.86	Not significant
	Sighted students	50	17.14	2.52		

Table-9 shows a significant difference in experience seeking and boredom susceptibility of visually impaired and sighted under-graduate students. Where as, the difference between disinhibition and total sensation seeking of sighted and visually impaired students was not statistically significant. The t-values of the comparison of experience seeking and boredom susceptibility were significant at 0.05 level and at 0.01 level respectively. Mean scores indicate that sighted students have high level of need for experience seeking than their visually impaired counterparts. But Visually Impaired students have high level of boredom susceptibility than the sighted under-graduate students.

Discussion

Results of the present investigation depict a significant difference in the experience seeking of visually impaired and sighted undergraduate students. Sighted students are found to have high level of experience seeking than their visually impaired counterparts. Furthermore, a significant difference was also found in the boredom susceptibility of sighted and visually impaired undergraduate students. Visually impaired under-graduate students are found to have high level of boredom susceptibility than their sighted counterparts. This result of the present study may be due to the fact that lack of recreational

facilities in the school as well as in the home leads the visually impaired students towards the feeling of boredom. So far the total sensation seeking is concern there is not any difference between sighted and visually impaired undergraduate students. This might be because of the fact that visually impaired students are also having the need for new and novel experiences.

Educational Implications

The present study has its implications for teachers, parents and other higher educational authorities. Most of the people show sympathetic attitudes towards children with special needs as compared to the children without disabilities. People think that, as these children have certain type of disability they can not think and act like students without disabilities. The present investigation indicates that, so far as sensation seeking is concerned both visually impaired and sighted undergraduate students don't differ significantly. It means both the group of students show equal level of sensation seeking. So far as experience seeking (one of the dimensions of sensation seeking) is concerned the difference between visually impaired and sighted students significant only at 0.05 levels of significant. In another dimension of sensation seeking i.e. disinhibition both the group of students don't differ significantly. It reveals visually impaired students also have need for new experiences. This need should not be suppressed; they should be provided equal facilities as compared to their able bodied students. One of the findings of present investigation reveals that 44 percent of visually impaired students are having boredom susceptibility. So these students should be provided equal leisure time facilities like able-bodied students. The parents of the disabled children should not be over-conscious of their children. They should understand the fact that except their physical limitations, these students do not differ from the able bodied children many ways. Teachers in the schools should be aware of these facts.

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Interactive Whiteboard: A Proficient Instructional Tool

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Abstract

Civilizations had evolved from using stones and metal tools to digital and electronic tools that have altered the functionality of the society and influenced the mode of teaching. Today, the pen and paper are replaced by iPod and stylus, printed books are being digitalized into eBooks and conventional classroom boards are replaced by Interactive Whiteboards to make pace with the digitized world. Where on one hand the countries across the globe are taking initiatives to digitalize their classrooms via IWB, India on the other still lags behind. The rationale behind this paper is to fetch the attention of the policymakers, teachers and stakeholders towards the positive effects of IWB on teaching-learning so as to make them recognize IWB as a proficient instructional tool that might encourage the penetration and use of IWB into the Indian classrooms.

Key Terms: *Interactive Whiteboard, Penetration, e-teaching, e-learning, benefits*

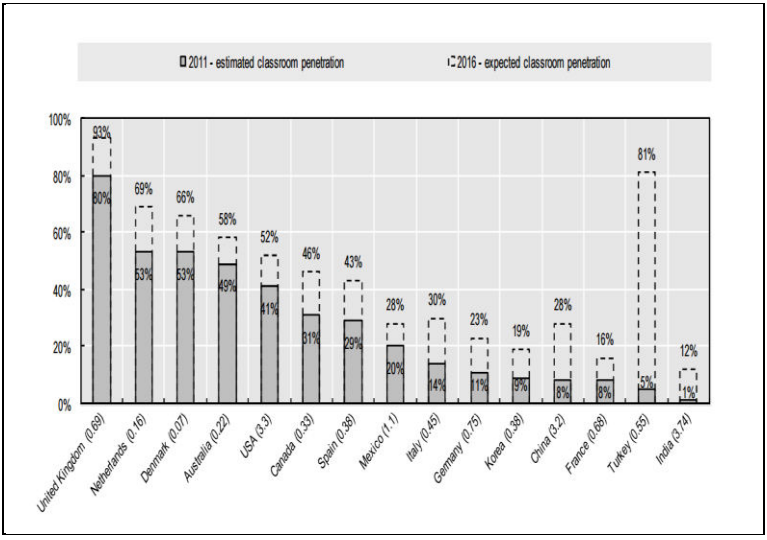
Introduction

An interactive whiteboard (IWB) is a large interactive display that allows data from the computer to be displayed onto a board using a digital projector that can be controlled using a finger, stylus, or other device (BBC Active, 2010). The word "interactive" implies the ability of the IWB to manipulate the data projected and to perform many interactive activities apart from simply projecting text, images and graphics, presentations or films like, writing, and erasing the board, highlighting or marking the text or image, drag & drop an image or text on the board, hide and reveal a part of image or text, etc. (Betcher & Lee, 2009, Ikan et. al, 2011). This interactive communication between the data from the computer and Interactive Whiteboard is feasible because of the software. The Software contains tools and applications to support interaction such as; Pens and highlighters to write or

highlight a specific area, digital galleries for ready to use multimedia resources, page recording capabilities to record the activity taking place on the IWB and many more. (Betcher and Lee, 2009 & Coffee, 2012)

Penetration of IWB in India and Abroad

David Martin and Nancy Knowlton in 1991 gave the world its first interactive whiteboard popularly known as SMARTboard (Coffey, 2012). Since the invention of IWB, policy and projects were launched in various counties in the starting of 21th century so as to introduce the IWB into the teaching-learning process for example Schools Whiteboard Expansion in 2003-04 and Schools Whiteboard Expansion Evaluation Project in 2004-2005 were launched in London, Mexico initiated an IWB expansion scheme in 2004, Turkey launched FATİH project in 2012 that aim to equip 620000 classrooms with IWB (Hennessy & London, 2013), e-classroom project was also launched in 2012 by KVS that aimed at converting 500 classrooms (MoM, 2011). A market research company Future source Consulting (2012) studied the penetration of IWB among various countries that illustrated that UK has the maximum number of IWB classrooms and India has the least IWB classrooms (Hennessy & London, 2013) as represented by following graph:



Source: Future source consulting (2012)

The estimated penetration of IWB in the Indian classroom in 2016 is also expected to be the least among countries which is true in the current scenario as still none of the schemes and policy launched on ICT by Indian government implicitly mentions the use of IWB as an instructional tool. KVS was the first one to initiate the use of IWB in central schools via a pilot project; e-classroom.

The major reason of lowest IWB penetration in India is the lack of any policy and project that could aim at digitalization of Indian Classrooms via IWB. The coming National Policy on ICT in schools and successful ICT@school scheme does not stress the installation of IWB into classrooms.

Benefits of IWB on Teaching-Learning

The students today grow up in the era of internet and mobile technologies; they demand instant access to information and are habitual virtual seekers of knowledge. Hence the conventional chalk and talk ways of instructing neither interest students nor they are able relate with it. Having an Interactive Whiteboard in the class provides access to digital and multimedia resources thus maintaining the continuity with their digitalized environment and hence Betcher & Lee (2009), describes IWB as a revolutionary tool for teaching which connects it to the e- learning in a digital world. A term introduced by Betcher and Lee (2009) for this purpose is e-teaching defined as "the use of ICT to enhance the act of teaching".

Taking evidence from researches and literature following benefits could be drawn from the use of IWB:

Multimedia Presentation to match up with Multiple Intelligence

The good instructional tool is one that can support varied teaching styles to cater the needs of all types of learners. The potential of IWB lies in the fact that it supports various types of media. It has screen to write, camera to capture snap, audio and video play, Flash for interactive power point, interactive software for providing stimulation and many more. It's the reason it can mix two or more media type during instructions, for example sound files could be linked to the words so that students can hear pronunciation or a video could be added demonstrating the shown concept (Betcher & Lee, 2009) which supports kinesthetic, auditory and visuals learning styles (Bell, 2002). IWB also fosters multiple intelligences as students can be projected with a poem and involved in shared reading activity to develop

linguistic abilities and in the next class, mathematical concept can be strengthen by engaging them in interactive visual activity for example, interactive geoboard that measures angles. (McCOOG, 2007)

Versatility in Expressing Content

Apart from supporting multiple means of representation, IWB also support various ways of expressing these media type. Photographs can be zoomed in and out, audio can be stopped and started, video can be edited into relevant snippet, text can be manipulated and many more ways to deal with the content are offered by the tools of IWB software. The versatility of expression promotes conceptual clarity among learners as Edward (2002) found that in mathematics, real time movements such as rotation and highlighting supported the teaching of fractions and shapes (Smith, et. al. 2005). It also helps children with special needs for example image or text can be enlarged or highlighted to help learners with visual disability or converted into sign language to help those students who cannot hear or speak. (White Paper, 2009)

Promotes Flexibility

IWB is a '*flexible tool'* (Smith, et al., 2005) that could be used across all age groups and setting from nursery to higher education and even distance education. Use of computer or any other ICT require some pre-requisite skills but IWB can be use even with those who don't know typing or don't have IT skills (Somekh, et al, 2007). In an action research by Preston & Mowbray (2008) it was found that the use of interactive whiteboards during kindergarten science lessons can enhance the teaching and learning by providing visual step-by-step directions and increased interactivity.

The IWB also supports flexibility during teaching in number of ways like accessing information from the multiple web-sources, opening number of screen at a multiple time, taking snapshot of the content on the screen or from the internet and save them for later use, reviewing previously saved notes or discussion points. Miller and Glover (2002) in an observation found that primary teachers split IWB into three screens each used to develop comprehension of a text at three different levels supporting the pace of reading of learners.

Aid in Development of Resources and Instructional Preparation

The role of teacher in the 21st century has evolved from being the "source of knowledge" to an "information architect" (Betcher & Lee, 2009). It means that teachers had to organize the information and

activities from various sources to bring about the meaningful learning which is a time consuming process. Savable screens, Camera tool and availability of ready to use interactive activities in IWB provide teachers with various options to create, save, share, reuse and adapt various instructional materials available on web which save preparation time and reduce workload IWB also offers '*seamless flow*' from one teaching point to another as it saves time spent on the arrangement and management of resources from one lesson to the next (Smith, et al., 2005).

Enhance Learner's Interaction and Participation in Classroom with IWB

IWB supports games and interactive activities that promote technical interactivity for learners and thus enhance the classroom interactions and learners participation. Austin (2003) found that in a use of a 'number program' pupil came and counted backward or forward on a number line displayed on IWB (Smith, et, al., 2005). A large scale evaluation of the impact of IWB for UK's Primary National Strategy's 'Embedding ICT' pilot project was conducted that investigated the impact in terms of classroom interaction and it was found that number of classroom interaction were more in IWB supported classroom. Also the frequency of answering was more in case of IWB classrooms (Higgen's et al. 2007).

Enhance Attention & Increase Retention

Attention is most crucial to learning as unless the learner is attentive to the instructional material presented, the learning will not take place. Therefore "gaining the attention" is placed at the first place in Gagne's nine events of instruction. IWB aids in attracting the attention of the learners through its multimedia presentation. The interactive tools available in the IWB software also enable the teacher to focus attention of the students on the specific area of the content either by highlighting, marking, hiding the irrelevant part and many more tools (Gerard and Wider, 1999).

In a experimental study by Erbas, Ince and Kaya (2015) on learning mathematics with IWB, it was found that students in the experimental group were more attentive, actively involved, asking questions and making connections with what they have learned before, whereas students in the control group got bored after drawing few graphs.

IWB also enhances the retention of information by providing multiple representation of a lesson so when the verbal instruction is followed be a visual image it enhances pupil's recall as according to Triechler's Relative Effectiveness of Primary Senses (1967) people remember 10% of what they read, 20% of what they hear, 30% of what they see and 50% of they see and hear (Spencer, 1988, pp. 103).

Enhances Motivation

White Paper (2006) describes motivation in the context of classroom as the "*student's drive to participate in the learning process*". IWB appeals both intrinsically and extrinsically to the students; intrinsically motivated learners volunteer to demonstrate knowledge on IWB and extrinsically motivated students are attracted by the novelty of the technology, expressed by being attentive (Bell, 2002; Levy, 2002; Miller & Glover, 2002 and BECTA, 2003). In an experimental study towards a class project, Weimer (2001) measured student attitudes and motivations and it was found that motivation among pupil who had to present their projects using an IWB was more.

Developing ICT Skills

Frequent use of IWB leads to the incidental improvement of ICT skills among pupil by observing teachers using IWB. Improvements in ICT skills are due to the fact that size and clarity of images (enhance visibility) on an IWB are easier to follow than the movement of a mouse pointer across a small screen (Bell, 2002; Levy, 2002). In a study by Hodge and Anderson (2007), a teacher used shared book reading activity in which she copied text and image from various website with her learners, apart from developing the comprehension skills learners also developed website navigation skills.

Improving Conceptual Understanding

The capacity of IWB to present a range of multimedia resources help pupil to study a concept from variety of sources and in number of ways makes ideas and concepts more 'tangible' and easier to grasp (Levy 2002). For example, the facility of IWBs to combine sound with graphic and iconic visual images is claimed as particularly useful to learning about music (Wiggins & Ruthmann 2002). LeDuff, (2004) suggested that ability of the IWB to support stimulation enables to form virtual laboratories, which can provide a substitute where hands-on laboratories are not available.

Conclusion

In the era of e-learning, there is a compelling need to provide e-teaching to the learners of this digital world. Interactive Whiteboard has emerged as a promising instructional tool that could impart e-teaching through digital convergence. The facility of IWB to support multiple presentation, expression and engagement of content that could be controlled by touch has many positive effects on the teaching- learning process as evident from the researches and reviews across the globe. IWB can also reduce the expenditure spends on ICT as it has the potential to integrate all the media into one. It also supports whole class teaching so a classroom can be made "smart" by installing just one IWB rather than 40 computers (as mentions by ICT @schools). Hence looking at the potentialities of IWB on teaching-learning process it is imperative to enhance the penetration of interactive boards into the Indian classrooms so as to foster ICT skills among the Indian students and to be at par with the global world.

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Attitude of Student-Teachers of Primary and Secondary Teachers' Training Institutes towards E–Learning

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Abstract

In this age of Information and Communication Technology, e-learning is a widely accepted way of training because it offers flexibility, accessibility and standardization of the overall educational process over traditional classroom-based teaching. Easy access to internet enables the student-teachers to be competent learners. They can highly benefit from the wealth of information available on the internet during their training and real-time teaching in schools in near future. In this regard, the present study was conducted to investigate the attitude of student-teachers of primary (D.El.Ed.) and secondary (B.Ed.) teachers' training institutes towards e-learning. The study involved 165 student-teachers as sample from eight primary and secondary teachers' training institutes of two districts of West Bengal. Data-gathering tool used included a questionnaire on "Student-teachers' attitude towards e-learning" having a reliability coefficient of 0.734 (Cronbach's Alpha). Findings reflected that the distribution of data fitted the normal distribution. Student-teachers of B.Ed. and D.El.Ed. differed significantly (p=0.018) in their attitude towards e-learning. However, no significant differences were observed in student-teachers' attitude towards e-learning with respect to gender and locality of residence (p=0.395 and p=0.545 respectively). Also no significant first order and second order interaction effects were detected. This study may prove its importance in determining the significant factors which affect the proper development of positive attitude towards e-learning among students, teachers, student-teachers and teacher educators. Based on this, suitable e-learning environments can be developed and/or improved in educational institutions at all levels.*

Keywords: *e-learning, student-teachers, attitude, primary teachers' training institutes, secondary teachers' training institutes*

Introduction

The term 'e-learning' meaning 'Electronic Learning' is basically the "online delivery of information, communication, education, and training" (Wild, Griggs & Downing, 2002) involving the use of computer and internet to aid in the learning process. Today's global and competitive environment is characterised by the advent of information society. Using the technology of e-learning in this time, therefore, is a widely accepted strategy of training because it offers flexibility, accessibility and standardization of the overall educational process over traditional classroom-based teaching-learning strategy (Table 1).

Table 1: Benefits of Online Learning over Classroom Learning (Herselman & Hay, 2005)

Aspect	Classroom Learning	Online Learning
Access	Limited	Always available
Quality	Varied	Consistent
Measuring of result	Difficult	Automatic
Retention of information	Varied	High
Relative cost	High	Low
Access to resource	Limited	High
Flexibility	Low	High
Communication with facilitator	Limited	High
Interactivity	Not guaranteed	Guaranteed

For a country like India with vast geographical territory sheltering world's largest illiterate population of 287 million accounting 37% of the country's population (UNESCO, 2014), the role of e-learning in helping the Government to achieve its goal of eradicating illiteracy completely is enormous and noteworthy.

E-learning provides learning materials in all kinds of formats such as videos, slideshows, HTML pages, word documents, PDFs, live online classes and communicating with teachers via chat and message forums. The most commonly used services associated with e-learning are: e-mail, voice mail, blog, cloud services, internet searching, instant messaging, file transfer, remote login, news groups, video conferencing etc. The efficiency of e-learning strategy depends on several factors (Tuparova et al., 2006):

- Use of suitable technological tools– both hardware and software. Choice of appropriate didactical approaches taking into consideration the different abilities and preferences of learners as well as teachers.

- Requirement of high level competence of teachers as developers of e-learning contents and as tutors implementing readymade courses.
- Need of positively motivated teachers and students as users of ICT and e-learning.

Review of related Literature

Several extensive studies have been conducted so far on different areas related to e-learning. But very few literatures were found related to the focus of the present study at national level (Krishnakumar & Kumar, 2011; Lawrence & Barathi, 2014; Pradhan, 2015). Among those found at international level, Tuparova et al. (2006) estimated the current level and practices of e-learning in Bulgarian universities. The research work of Rhema, Miliszewska & Sztendur (2013) showed the experiences in and perceptions of using ICTs and e-learning among engineering students and instructors. The study conducted by Yurt, Kurnaz & Sahin (2014) explained the nature of education faculty students' attitude towards e-learning according to gender, internet use and personal mobile learning devices. Moreover, research work of Akbari, Eghtesad & Simons (2012) investigated students' attitudes towards using social networks in learning Languages.

Besides, few studies were found on advantages and disadvantages of e-learning which included the work of Sheypak, Artyushina & Artyushina (2007). Study of Arkorful & Abaidoo (2014) investigated the effectiveness of using e-learning in teaching in tertiary institutions. Additionally, challenges and benefits of e-learning at school level were dealt by Dargham, Saeed & Mcheik (2012). Sheikh (2012) investigated another new area dealing with the trends and issues of e-learning in LIS-education in India.

From the above discussion, it is very clear that there is dearth of research works on the focused area of study at the national level; and therefore, more research works are required to be conducted for better understanding of the current scenario of e-learning. In this age of ICT, most of the learners have easy access to the internet that allows them to be competent e-learners. Similarly, student-teachers having positive attitude towards e-learning can benefit from the wealth of information available on the internet during their training as well as during their real-time teaching in schools in near future. In this regard, the present study may become very essential and significant as it will give a reflection on the attitude of 'would be teachers' towards e-learning that,

in due course, will play an important role in shaping the education system of nation.

Objectives of the Study

1. To study the nature of distribution of data across different categories of student-teachers.
2. To study the attitude of student-teachers of primary and secondary teachers' training institutes towards e-learning.
3. To study the effect of class (D.El.Ed. and B.Ed.), gender (male and female) and locality of residence (rural and urban) on the attitude of student-teachers towards e-learning.

Hypotheses of the Study

$H_0$1. The observed distribution of data fits the normal distribution.

$H_0$2. There is no significant difference in the student-teachers' attitude towards e-learning with respect to-

a. class

b. gender

c. locality of residence.

$H_0$3. There is no significant interaction effect on the student-teachers' attitude towards e-learning between-

a. class and gender

b. class and locality of residence

c. gender and locality of residence.

$H_0$4. There is no significant interaction effect of class, gender and locality of residence on the attitude of student-teachers towards e-learning.

Methodology

Population and Sample:

The student-teachers of primary and secondary teachers' training institutes were selected as the target population. Four primary (D.El.Ed.) and four secondary (B.Ed.) teachers' training institutes of Purba Medinipur and Howrah districts of West Bengal were selected to collect data where the institutional authorities permitted the researchers to undertake the research work. The study comprised 165 student-teachers as the sample from those institutes on the basis of different

traits viz. class, gender and locality of residence. The entire scheme of sampling is mentioned below (Table 2):

Table 2: Sample Categories and Size

Category	Rural		Urban		Total
	Male	Female	Male	Female	
D.El.Ed.	26	40	08	11	85
B.Ed.	19	30	10	21	80
Total	45	70	18	32	165
	115		50		

Tools and Techniques of Data Collection:

A questionnaire on "Student-teachers' attitude towards e-learning" (30 items) was used for the purpose of data collection which was developed by the researchers with reference to a questionnaire developed earlier by Raut J. S., 2008. The reliability coefficient of the questionnaire was calculated as 0.734 (Cronbach's Alpha). The scale used was Likert type (5 point). Both positive statements (e.g.- I often search the internet for information related to my study) and negative statements (e.g.- I feel helpless when asked to use internet for college works) were included. For scoring, numerical values were assigned to the five categories of the responses as: strongly agree=5, agree=4, neutral=3, disagree=2 and strongly disgree=1 for positive items, and reverse for negative items. Obtainment of high scores in the scale indicated high degree of attitude of student-teachers towards e-learning and vice versa.

Descriptive survey method was employed to collect necessary data. The hypotheses formed earlier were tested through test of normality and univariate analysis of variance using IBM SPSS Statistics 21.0 software.

Data analysis and interpretation

(I) Descriptive Statistics:

Table 3: Descriptive Statistics of the Scale

Scale	N	Range	Mean	Std. Deviation	Std. Error	Skewness	Kurtosis
Student-teachers' attitude towards e-learning	165	55	106.15	11.066	0.861	-0.125	-0.474

The descriptive statistics of the scale (Table 3) shows that the mean score is 106.15 out of maximum possible total score of 150 (30×5) in all questionnaire items with SD of 11.066 and range of 55 (min.=75

and max.=130). Both the calculated skewness (-0.125) and kurtosis (-0.474) values are very low indicating the negatively skewed and slightly flattered nature of the score distribution. The distribution of scores along with their frequencies is displayed below (Fig.1):

Fig.2: Graphical frequency distribution of the scores

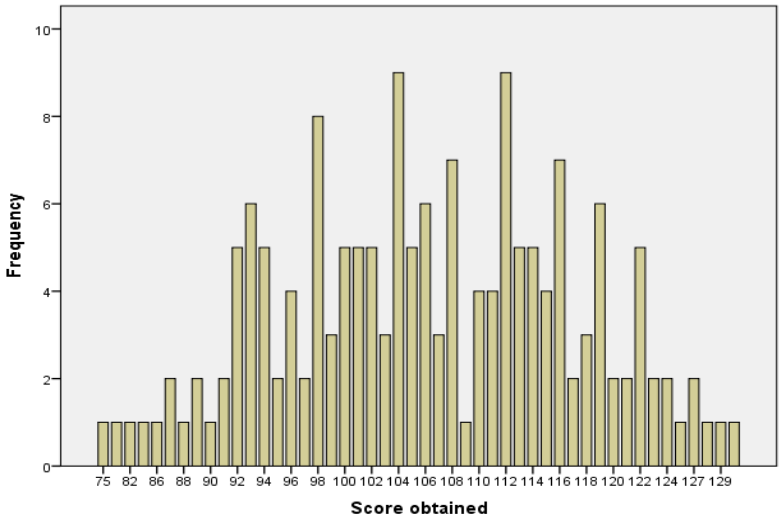

Table 3: Category-wise descriptive statistics

Category	Class		Gender		Locality of residence	
	D.El.Ed.	B.Ed.	Male	Female	Rural	Urban
N	85	80	63	102	115	50
Mean	103.27	109.21	107.00	105.63	105.45	107.76
Std. Deviation	11.135	10.196	11.007	11.124	11.333	10.356

The mean and SD for each category of the sample (Table 3) indicate that the mean difference is high in case of class (D.El.Ed.=103.27 and B.Ed.=109.21), but low in both the cases of gender (male=107.00 and female=105.63) and locality of residence (rural=105.45 and urban=107.76).

(II) Testing of Normality:

Table 4: Result of Shapiro-Wilk test of normality

Scale	Shapiro-Wilk		
	Statistic	df	Sig.
Student-teachers' attitude towards e-learning	0.991	165	0.364

From the result of Shapiro-Wilk test of normality (Table 4), it is observed that the calculated p value is greater than the critical value 0.05 (p=0.364). Hence, the null hypothesis $H_0$1 is retained and it can be stated that the distribution of data is parametric, i.e. it fits the normal distribution.

(III) Testing of Main Effects and Interaction Effects:

Table 6: Univariate ANOVA of attitude towards e-learning scores in relation to class, gender and locality of residence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1891.485	7	270.212	2.332	0.027
Intercept	1422166.014	1	1422166.014	12273.714	0.000
Class (A)	658.668	1	658.668	5.685	0.018*
Gender (B)	84.144	1	84.144	0.726	0.395
Locality (C)	42.702	1	42.702	0.369	0.545
Class * Gender (A×B)	104.320	1	104.320	0.900	0.344
Class * Locality (A×C)	162.676	1	162.676	1.404	0.238
Gender * Locality (B×C)	4.754	1	4.754	0.041	0.840
Class * Gender * Locality (A×B×C)	128.892	1	128.892	1.112	0.293
Error	18191.727	157	115.871		
Total	1879327.000	165			
Corrected Total	20083.212	164			

* Significant at 0.05 level

1. Main Effects: The first main effect of class (A) is significant (p=0.018*) at 0.05 level. Therefore, the null hypothesis $H_0$2-a is rejected and it can be stated that the student-teachers of D.El.Ed. and B.Ed. differ significantly in their attitude towards e-learning. This result

is observed because the entry-level qualifications for both the classes (i.e. B.Ed. and D.El.Ed.) are not same. Admission into B.Ed. course requires higher academic qualifications (graduation and/or post-graduation) comparing to the academic qualifications required for admission into D.El.Ed. course (higher secondary). As there are essential academic requirements of e-learning in graduation and post-graduation levels, successful completion of these academic degrees may enable the B.Ed. trainees to hold more positive attitude towards e-learning than the D.El.Ed. trainees who are still not exposed to the electronic world entirely.

However, the other two main effects of gender (B) and locality (C) are not significant (p=0.395 and p=0.545 respectively) at 0.05 level; therefore both the null hypotheses $H_0$2-b and $H_0$2-c are retained. It indicates that in this recent period of gender equity and globalization, females are not left far behind the males in terms of the electronic mode of educational opportunities; and rural students are also advancing almost equally like the urban students in respect to the internet access and e-learning facilities in their locality.

2. Interaction Effects: In case of the first order interaction effects (A×B, A×C and B×C), it is found that there are no significant interaction effects present between class and gender (p=0.344), between class and locality (p=0.238), and, between gender and locality (p=0.840) at 0.05 level. Therefore, all three null hypotheses $H_0$3-a, $H_0$3-b and $H_0$3-c are retained. This shows that the factor of class appears to have no significant effect on student-teachers' attitude towards e-learning when gender or locality is considered in combinations/interactions. In case of the second order interaction effect (A×B×C), a non-significant interaction effect is detected among class, gender and locality (p=0.293) at 0.05 level. Therefore, the null hypothesis $H_0$4 is accepted; i.e. there is no significant interaction effect of class, gender and locality on student-teachers' attitude towards e-learning.

Conclusion

Positive attitude towards e-learning determines to a great extent the utilization of ICT and internet as a strong tool for a positive change in teaching-learning process. Therefore, it is indispensable to develop proper attitude among teachers, students, student-teachers and teacher educators towards e-learning so that its benefits can be extracted optimally. In order to accomplish this, a range of awareness programmes, technology literacy programmes and hands-on activities

(exhibiting, tutoring, practicing, evaluating etc.) must be conducted at institutional level. Besides, all the stakeholders should learn to deal effectively with various factors (anxiety, poor knowledge, lack of facilities and infrastructure etc.) that may potentially interfere and restrict the proper development of the attitude towards e-learning. This would help in the 'making' of competent teachers and students irrespective of any physical, social, economical, cultural or political barriers of reality.

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Effectiveness of Educational Technology in the Learning of Algebraic Concepts of Elementary School Students

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Abstract

In the present scientific and technological age, the methods of teaching mathematics also need to be modified, enriched and changed to meet the aspirations of the new generation learners….To strengthen this aspect, the present study has been conducted in which the author wants to analyze the usefulness of technology education integration in Learning of Algebraic Concepts of Elementary School Students. For this she conducts a study. Rather than looking at comprehensive technology integration, this study is focused on one curricular area currently taught at the elementary level (in the seventh grade at a south Delhi school). The focus of this study is algebra.

Introduction

Globalization and technological change processes that have accelerated over the past years have created a new global economy – powered by technology, fuelled by information and driven by knowledge. As a result of this, 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, educational institutions can highly promote the acquisition of knowledge and skills by means of different technologies, which help in continuous learning over the lifetime.

Educational Technology Integration

In its broadest meaning, technology is defined as the entity, both material and immaterial, created by the application of mental and physical effort in order to achieve some value. In this usage, technology refers to tools and machines that may be used to solve real-world problems. It may include simple tools or complex machines. These tools and machines need not be material; virtual technology such as computer software falls under the definition of technology. W. Brian Arthur defines technology as "a means to fulfil a human purpose".

Educational technology and e-learning can occur in or out of the classroom. It can be self-paced (asynchronous learning) or may be instructor-led (synchronous learning). It is suited to distance learning and is in conjunction with face-to-face teaching, which is termed blended learning. Educational technology is used by learners and educators in homes, schools, higher education, businesses and other settings.

The current school curriculum tends to guide teachers in training students to be autonomous problem solvers. This has become a significant barrier to effective training because the traditional methods of teaching have clashed with what is now expected in the present workplace. Today's students in the workplace are increasingly being asked to work in teams, drawing on different sets of expertise and collaborating to solve problems. These are twenty first century skills that can be attained through the incorporation and engagement with technology. Changes in instruction and use of technology can also promote a higher level of learning among students with different types of intelligence. Technology is not the end goal of education, rather a means by which it can be accomplished. Educators must have a good grasp of the technology being used and its advantages over more traditional methods. If there is a lack in either of these areas, technology be a hindrance rather than benefit to teaching.

E-learning is utilized by public schools as well as private schools. Some e-learning environments take place in a traditional classroom; others allow students to attend classes from home or other locations. There are several states that are utilizing virtual school platforms for e-learning across the country that continue to increase. Virtual school enables students to log into synchronous learning or asynchronous learning courses anywhere there is an internet connection.

All educators strive to prepare students to excel in the 21st century. The teachers of the 21st century have a very difficult challenge in front of them. Not only must they be able to successfully implement different teaching strategies and use new instructional technologies, they have to be able to integrate technology education into the students' curriculum (Dockstader, J. 1999). To truly integrate technology education you do not simply shove an activity in here or a unit there. In order for technology education integration to be successful the use of technology must not be a stand-alone activity, but rather a tool that is used

through out the curriculum in order to enhance the learning that takes place in the existing curriculum (Wright, M. & Foster, P. 1999).

Technology has a cyclical relationship with science and mathematics. The science community and classes strive to understand nature and the world around us, while technology strives to design a human solution. The science community strives to understand and the technology community takes that understanding and applies it to make our lives better. Mathematics and language become vital tools that are used universally by both science and technology (Fortier et al. 1998).

Need of the Study

The author wanted to analyze the usefulness of technology education integration in Learning of Algebraic Concepts of Elementary School Students. For this, she intended to conduct a study. Rather than looking at comprehensive technology integration, this study was focused on one curricular area currently taught at the elementary level (in the seventh grade at a south Delhi school). The focus of this study is algebra.

Algebra is a unit taught by all seventh grade teachers. Many elementary schools and teachers are concerned about the use of technology education at the elementary level. This paper looked at the overall usefulness of technology integration on one unit of instruction and, therefore, answered some of the questions about the usefulness of integration. It was the hope of the author that the students who constitute the research sample and received the new approach to the learning of algebra demonstrate a high degree of understanding and internalization.

Research Questions:

1. How can technology be efficiently used to reap rich benefits in Mathematics education?
2. Does integrated technology education stand useful?

Objectives:

1. To analyse how technology can be best used for optimum learning of algebra.
2. To determine the usefulness of the integrated technology in learning algebraic concepts by students of grade seven.

Methodology:

Research Design: A descriptive study method was adopted for the proposed study. The research was designed to assess the extent to

which technology is useful in the understanding of algebraic concepts at grade 7. Also, it was helpful in obtaining information regarding the challenges the students face while dealing with such unusual topics by means of technology.

Population of Study: The population of study were the students of class VII of Private Schools in South Delhi.

Sample of study: A two stage sampling method was followed – first for the selection of school and second for the selection of a section of class 7 from that school.

A list comprising of the Private Secondary Schools of South Delhi was made and a school was selected at random from the list.

Again, a section of class 7 of the above selected school was chosen at random to be the sample of study.

This was done keeping in mind all the information required for the research.

Tools and Techniques for Data Collection:

An achievement test comprising of 20 multiple choice items covering all areas of Elementary Algebra was developed. The test mostly had close ended questions only. The test items were in a simple, easy to understand language. They checked the basic knowledge, concept understanding and application of students. This test was used as a pre-test as well as post-test.

Procedure of Data Collection:

Data was collected through an achievement test. The test was conducted in the mathematics class itself. An achievement test was administered to 30 students of the chosen class as a pre-test. This was done to gauge their current level of understanding and document the results. This was followed by students getting hands on experience with technology to understand and apply the concepts of algebra for two weeks. The technology used was an online *Interactive Self Learning Programme* that provides in depth explanation, focuses on understanding and helps the child to improve his/her skills in varied areas of mathematics. Afterwards, the same test was given as post-test. Hence, data was collected from a sample of 30 students of a south Delhi school.

Also, after both the tests were administered, a few follow up questions were asked to evaluate the feelings of students' towards the new method of instruction using technology for teaching algebra. The

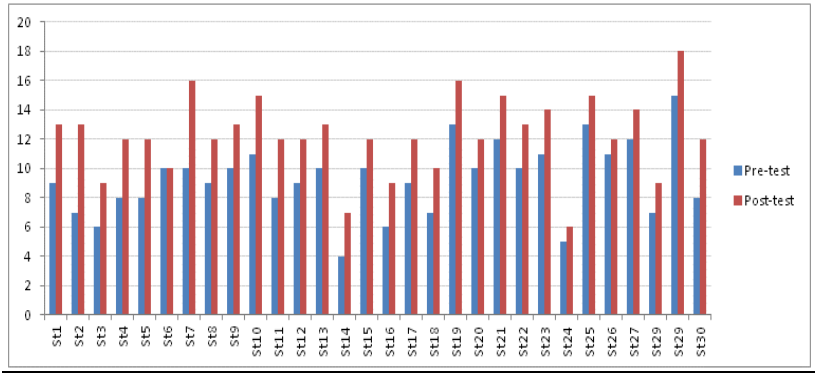
responses given by students helped to identify the hurdles faced by students while learning and also assess the overall usefulness of the technology education approach for the unit of algebra.

Data Analysis and Interpretation:

The data analysis of the study is both quantitative and qualitative in nature. It is based not only on the data collected by means of pre and post tests but also on observations and interpretations made during collection of data. The study was guided by the stated research objectives.

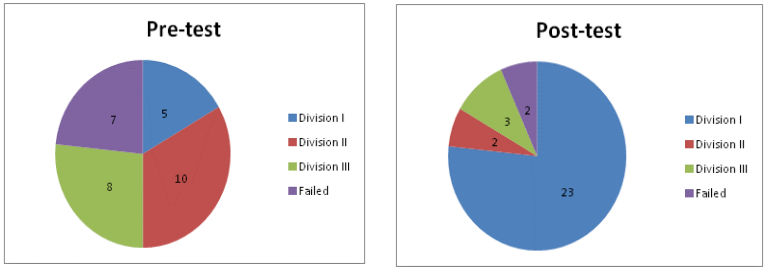
After the raw data was obtained (from which the analysis has been drawn), the next part of the data analysis was to look at the results from the pre technology test and the post technology test questions of the class. This data from the research could provide the backbone for the generalization that the use of technology would enhance students' understanding of unusual topics like algebra. The raw data has been tabulated and presented in the form of a bar graph and pie charts below.

Figure I: **Bar graph showing comparative results of pre test and post test of all students**



Referring to above, while many students scored very low before they were taught the concepts of algebra using the technological method of teaching, they improved themselves in the post technology test. This clearly indicates that they got benefitted on being administered with the software. As a matter of fact, all students except for one did better in the post test.

Figure II: Pie charts showing the number of children getting I, II and III divisions and the number of failures in pre test and post test



In the pre technology test one third of the class, had the first division while in the post test more than two thirds of them secured the first division. There were as many as 7 failures in the pre test and only 2 in the post test. A considerable reduction in the number of students failing the test infers the success of use of technology in the teaching of algebra. Thus, technology does have the power to teach complex topics like algebra to the students at secondary level.

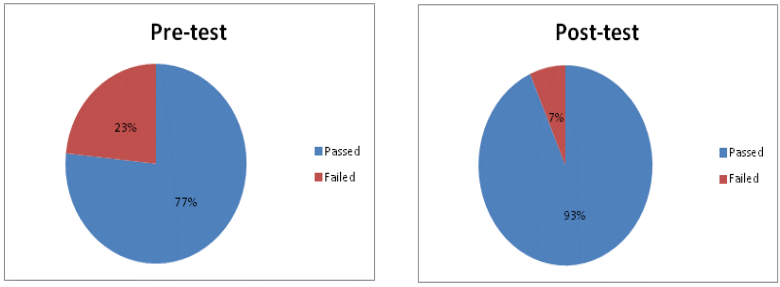


Figure III: Pass percentage in pre test and post test

The motive behind pre-test and post-test evaluation was to determine the overall impact of technology in the understanding of algebra. As illustrated in figure III shows that while only 77% of the class passed the test in the pre test, 93% students cleared the post test. It is a clear indication that they understood the concepts of algebra taught by means of technology and were able to implement them.

Conclusions:

As pre technology data and post technology data is observed, we witness a huge positive shift of concepts and ideas in the post technology test. It is evident that the students have understood and applied the concepts learnt through integration very well. As is everywhere, technology can be used to develop the foundation of algebra too. Use of different kinds of computer software and programs are indeed going to benefit the students in the long run. Teachers can help the students as guides and facilitate their learning as they try to understand topics through technology by their own selves.

A few conclusions have developed based upon the findings of this study. The use of different kinds of computer software, as the one used in this study, could be a useful tool for algebra or any other teaching unit of Mathematics too. The teacher can be a facilitator to the student and should be able to provide a conducive environment for learning while the student comprehends the lesson through technology. The use of technology is in accordance to the age of the students. The students of grade VII are not too small to mishandle the hardware and are big enough to explore.

Recommendations:

This is a narrow study to judge the overall effectiveness of technology in the field of education. A much more comprehensive study with an in depth analysis is required. This small work of research can be used as a mere stepping stone for thorough deep researches. Though the research provides a small example of the impact of technology in Mathematics, the scope and effect of technology in the area and in education are vast.

Further researches can be done to compare this study done in a private school to a similar one done in a government school. This would help us to know if the results differ due to the change in environment at the different schools. Technology can also be compared to traditional ways of teaching by means of a similar research.

Thus, this study can further lead to a lot of researches primarily in the field of education which would in the long run be beneficial to the mankind.

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Blended Learning: Emerging Trends in Higher Education

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Abstract

This is an era of everyday changes in every field including education due to rapid advancements in science and technology. Simultaneously, knowledge is expanding at lightning speed. To keep track of the advancements, the learners need to learn more, better and faster. This can be made possible today with the help of information and communication Technology. The rapid evolution of Information and Communication Technology and the emergence of the Information Society create numerous new opportunities for the improvement of the quality of education. Technology changes rapidly and in the next few years this could look very different. Education in the twentieth century has had remarkable changes in terms of the methods of imparting and receiving. India has the capacity to become the hub of technology-enabled teaching and learning with its IT artistry and strong education system.

Technology based learning can be viewed as an innovative approach for delivering well-designed, learner centred, interactive and facilitated learning environment to anyone without any discrimination of caste, sex and creed.

Blended learning raises the quality of education. It takes place either in classroom having formal structure or outside the school-home, neighborhood etc. in an informal manner where no physical teacher is present to instruct. Blended learning proves to be a powerful tool to ameliorate the learning process regardless of how and where learning occurs exposing the learner to various real-life situations in which he/she can use the target class.

In this paper, I look at the teaching pedagogy in the digital environment and teacher's role in digital era marked by emerging distributed learning environment.

Keywords: *Blended Learning, Emerging trends, Higher Education*

Introduction

World of pedagogic process has largely changed in most parts of the developed world since 1990s and Information and Communication

Technology. Information and Communication Technology (ICTs) have heavily influenced the pedagogic processes. Conjoined with the extensive use of ICT is the success if the Universalisation of Elementary Education which resulted in the growth in demand for higher education many times more than the system was planned for and ready to accommodate. Quality is sacrificed at the hands of quantity. However, we cannot ignore the demand. Maintaining and augmenting quality of higher education should be the primary concern of the education system. However, paucity of good teachers and classrooms cannot be filled as fast as we wish and require.

Information Communication and Technology has broadened the concept of teaching-learning environment, which has made it possible for learning experiences to be extended beyond the confines of the traditional classroom. Due to widespread use of ICT there are enormous increase in the impact of ICT on teaching and learning. Although it is often claimed potential change both teaching and learning, teachers have been subjected to public pressures to use new technologies before they and we have a clear understanding of their impact on classroom practices and student learning. Schools and classroom practices are being equipped without adequate research or attention to the preparation of teachers and the proper pedagogy and the suitable methodology to be adopted in the classroom instruction to transform the appropriate information in a concrete.

The term blended learning is generally applied to the practice of using both online and in-person learning experiences when teaching students. In a blended-learning course, for example, students might attend a class taught by a teacher in a traditional classroom setting, while also independently completing online components of the course outside of the classroom. In this case, in-class time may be either replaced or supplemented by online learning experiences, and students would learn about the same topics online as they do in class—i.e., the online and in-person learning experiences would parallel and complement one another.

Definition

Blended learning is a formal education program in which a student learns at least in part through delivery of content and instruction via digital and online media with some element of student control over time, place, path, or pace. Driscoll (2002) has defined blended learning

as meaning "to mix or combine instructional technology with actual job tasks in order to create a harmonious effect of learning and working."

The term Blended Learning refers to four different concepts and they are as under:

1) To combine or mix modes of web-based technology (e.g. Live virtual classroom, self-paced instruction, collaborative learning, streaming video, audio and text) to accomplish an educational goal;
2) To combine various pedagogical approaches (e.g., constructivism, behaviourism, cognitivism) to produce an optimal learning outcome with or without instructional technology;
3) To combine any form of instructional technology (e.g. videotape, CD-Rome, web-based training, film) with face to face instructor-led training; and
4) To mix or combine instructional technology with actual job tasks in order to create a harmonious effect of learning and working.

Comparing Blended Learning to other Forms of Learning

Unlike e-learning classes where students are physically separate from their teacher and classmates, blended learning occurs within a face-to-face class that happens at a specific place and time. Blended learning combines the support of classroom learning with the flexibility of e-learning.

The following chart shows some examples to clarify how different types of learning and teaching might occur.

Strategies, tools and resources			
Goal	**Classroom Learning**	**Blended Learning**	**E-Learning**
Communication between teacher and students	• Full group lessons • Small group lessons or tutorials • Individual conferences • Marked	• Full group lessons • Small group lessons or tutorials • Individual conferences • Marked	• Digital course materials • Online discussions • E-mail • Instant messages

	assignments and rubrics	assignments and rubrics • Digital course materials • Online discussions • E-mail • Instant messages • News announcements • Online calendar • Dropboxes • Online grade tool • Rubrics	• News announcements • Online calendar • Dropboxes • Online grade tool • Rubrics • Web conferences
Collaboration among students	• Learning centres or other room arrangements • Class discussions • Face-to-face group work	• Learning centres or other room arrangements • Class discussions • Face-to-face group work • Online group work • Online discussions • E-mail • Instant messages • Blogs • Electronic portfolios	• Online group work • Online discussions • Chat sessions • E-mail • Instant messages • Blogs • Electronic portfolios • Web conferences
Demonstration of learning	• Paper-and-pencil tests and assignments submitted in person • Live presentations, labs, performances, or exhibits of skill	• Paper-and-pencil tests and assignments submitted in person • Live presentations, labs, performances, or exhibits of skill • Models, works of	• Blogs • Electronic portfolios • Online discussions • Online surveys and quizzes • Assignments, such as essays, worksheets, slide

	• Models, works of art, posters, and other physical artifacts submitted in person	art, posters, and other physical artifacts submitted in person • Blogs • Electronic portfolios • Online discussions • Online surveys and quizzes • Assignments, such as essays, worksheets, slide shows, photographs, and videos submitted to electronic drop boxes	shows, photographs, and videos submitted to electronic dropboxes • Web conferences

Source: https://www.edu.gov.on.ca/elearning/blend.html

A course created in a blended learning model uses the classroom time for activities that benefit the most from direct interaction. Traditional education (especially at the college level) tends to place an emphasis on delivering material by way of a lecture, while in a blended learning model lectures can be videotaped ahead of time so the student can watch on their own time. The classroom time is more likely to be for structured exercises that emphasize the application of the curriculum to solve problems or work through tasks.

Why Blended Learning?

1. Increased student engagement
2. Provided student autonomy
3. Instilled a disposition of self-advocacy
4. Promoted student ownership
5. Allowed instant diagnostic information and student feedback

Blended classrooms are working to create unique and memorable experiences for students that extend beyond traditional instruction into individually designed lessons that meet students where they are, and motivate and effectively challenge.

Blended Learning Redefining Teaching Roles

In some situations the move to blended learning has inspired educators to redefine traditional roles. The 'facilitator' has emerged as an places an emphasis on empowering students with the skills and knowledge required to make the most of the online material and independent study time, guiding students towards the most meaningful experience possible. Facilitators focus on four key areas:

- Development of online and offline course content.
- Facilitation of communication with and among students, including the pedagogy of communicating content online without the contextual clues students would get in person.
- Guiding the learning experience of individual students, and customizing material wherever possible to strengthen the learning experience.
- Assessment and grading, not unlike the expectations for teachers within the traditional framework.

By putting an emphasis on learning through supervised activities, blended learning has proven to be very adaptable to what some corporations are calling blended training. Trainers can shift their focus from the delivery of knowledge to its application, and companies spend less flying trainers around to oversee all instruction in person.

In Nut Shell

In the technological era blended learning has become the effective tool of acquiring advanced information and knowledge. It enables the learner to access the relevant information and resources anytime and anywhere. it has tremendous benefits not only for teachers in terms of capabilities to access information and resources of various kinds and to utilize them n their teaching-learning process but also make difference in their students' learning. It develops the abilities of students to receive the updated knowledge that they are looking for but also provides a virtual platform that helps to contribute to the future excellence in their own field because it has the power to transform education and improve the teaching-learning process.

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In-Service Programmes in Information Communication Technology (ICT)

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Abstract

India is gearing up for making the most out the potential of ICT in national development through the digital India Programme. The Scheme on ICT and ICT policy in school Education (2009) are being implemented to harness the opportunities that are likely to be available due to improved infrastructure in digital technology. It is inevitable to mobilize the school teachers through the integration of technology to make sure that we are able to provide competent learning environment to our children so that they acquire the skills, knowledge and attitude expected of them. In India INSET is organized by the SCERTs, DIETs, Teacher Education instittutions, and other private agencies. A study was conducted on the availability of INSET in ICT in six states. The findings of the study reveal that the basic computing skills are being covered by these programmes. There is a need for going further to knowledge deepening and knowledge creation levels. There is a need for covering the ethical issues related cyber use to develop in children digital wellness. The study found IT@ school and Intel in-service programmes in ICT as best examples.

Introduction:

According to Education for All Global Monitoring Report (2013/14) education system is only as good as its teachers. Technology integration in education has been recognized as a factor that could influence the quality of education. According to Bokova (2012) "Technology can be a powerful education multiplier, but teacher must know how to use it. It is not enough to install technology into classrooms its must integrated into learning" Information Communication and Technology(ICT) is an important component of In-service programmes for teachers at all levels of schooling in India for the last one decade. The role of ICT in day today life and its

potential for employment has been recognized all over the world. Though the Computer Literacy and Studies (CLASS) (1984), the scheme on Information Communication Technology (ICT) in Schools (2004), Sarva ShikshaAbhyan(SSA) , and in 2014 onwards subsumed in Rashtriya Madhyamik Shiksha Abiyan(RMSA) are having in-service progammes for teachers in ICT. The ICT scheme not only provides for infrastructure but also covers capacity building and development of e content. There is a provision of a computer teacher in all government and government aided secondary and higher secondary schools and provision of in-service training to all teachers to enable them to impart ICT integrated teaching. (MHRD,2015). Though the eleventh five year plan had allocated ten thousand crores rupees for integration of technology of which 5000 crore rupees were for integration of ICT at school level, ICT integration needs to be further strengthened.

At present, Digital India is a flagship umbrella programme of the government of India which includes several schemes aimed at inclusive growth in areas like broadband and mobile connectivity, government services on demand, local manufacturing and job opportunities for Indians. It takes into account the rural folks, the poor people and creates employment.

According to Digital India Portal of the Government of India (2015), all schools will be connected with broadband and free Wi-Fi will be provided in all secondary and higher secondary schools (coverage would be around 250,000 schools) in a phased manner. A programme on digital literacy would be taken up at the national level and Massive Online Open Courses (MOOCs) are to be developed and leveraged for e-Education.

All these have implications for teacher educators. There are many challenges associated with use of ICT. The Global Youth Online Behaviour Survey conducted by Microsoft ranked India third in cyber bullying. The preparedness of teachers to deal with these changed learning environments add to the challenge. One major factors of its success will be the ability of the people to use the provisions and teachers at all levels of schooling should acquire ICT competency to harness the opportunities that could result through these programmes.

The education system at all levels has to gear up to this challenge. The role of the schools in the integration of ICT is well recognized by governments all over the world as evident from the fact that substantial amount of money for instance, about 567.8 million pound was spent for

providing policy environment, digital curriculum, skills and professional development of teachers in United Kingdom (UK)of which 30% was devoted to professional development pertaining to effective use of ICT. (Twining and Hentry,2014).

The term ICT includes but not limited to the use of computers, laptops, tablets, doodles, LCD projectors, mobiles, internet and intranet. The ICT competency is the ability to use technology as a tool to research, organize and communicate information in ethically and legally appropriate manner (Zhang and Martinovic,2008).

An understanding of the present situation would help in organizing teacher education programmes in ICT in a better way. There are many studies capturing the scenario in the preservice teacher education setting (Kim,2013) but the in service component is also crucial, therefore the present study was taken up.

As there are many studies on different aspects of use as well as training of ICT by teachers some of them are reviewed below. These reviews cover aspects related to factors that influence the use of ICT in class rooms, projects of ICT training for teachers: objectives, content and methodology in the in-service context.

Brito, et.al.,(2005) conducted a national study in Portugal on the In-service training in ICT offered by institutions supported by Programme for Educational Development in Portugal(PRODEP) and reported an evolution of training contexts from 1 to 4.

MacNeil& Delafield (1998) found that the main inhibitors to implementing technology in the classroom are lack of financial resources for hardware, software, and infrastructure, and lack of time for professional development and planning. In another study Pelgrum (2001) asked practitioners from 26 countries what were the main material and nonmaterial obstacles for ICT implementation and ten most commonly cited obstacles were : insufficient number of computers, teachers lack knowledge/skills, difficult to integrate in instruction, scheduling computer time, insufficient peripherals, not enough copies of software, insufficient teacher time, not enough simultaneous access, not enough supervision staff, and lack of technical assistance

One of the problems with technology integration is the barriers teachers face. In their research, Jenson, Lewis & Smith (2002) summarized these barriers as limited equipment, inadequate skills, minimal support,

time constraints, and the teachers' own lack of interest or knowledge about computers. Aduwa-Ogiegbaen &Iyamu (2005) reported the effort of ICT usage and obstacles to use ICT in secondary schools in Nigeria. They claimed the obstacles for ICT use in secondary schools as cost, weak infrastructure, lack of skills, lack of relevant software, and limited access to the Internet. According to Warshauer (2003), on the other hand, there are contradictions between the rhetoric of reform and the reality of school practice. Warshauer (2003) found that technology integration is constrained by political, cultural, and economic factors.

The present research study was designed to gain some understanding of integration of ICT in in-service teacher training programmes at different levels in India. At a time when government initiatives are promoting the use of ICT in education it is important to understand how ICT is impacting on teachers' learning and factors affecting its use.

The Objectives of the Study are:

1. To study the availability of In-service programmes in ICT for teachers at different levels in different states**.**
2. To study the content of the different In-service programmes in ICT for teachers at different levels in different states.
3. To assess the perception of teachers regarding the need for training in ICT through In-service programmes in ICT for teachers at different levels in different states.
4. To suggest measures to improve the training in ICT given through In-service programmes in ICT for teachers at different levels in different states, if any
5. To show case best practices in the In-service programmes in ICT for teachers at different levels in different states.

Design and Plan of the Study

The present study was an exploratory study using survey method covering teacher education institutions/agency like: SCERTs, DIETs, Teacher training centre's, Science centre's, Computer training centre and different agencies in Delhi, Haryana, Punjab, Kerala, Mizoram, Uttar Pradesh, and Rajasthan. The population of subjects covered in the current study was all the in-service teachers who were attended INSET programmes in ICT or computer literacy in the session 2008-2011.The Sample of this study was drawn from the population of in-service

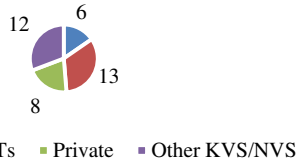
teachers in 6 states (Delhi, Uttar Pradesh, Haryana, Mizoram, Punjab, Kerala, and Rajasthan in the place of Punjab)

Table -1: Region wise Distribution of the Sample of Agencies offering In-service Programme in ICT:

Region	Delhi	UP	Mizoram	Haryana	Kerala	Rajasthan	Total
SCERT	1	1	1	1	1	1	6 (15%)
DIETs	6	2	1	1	2	1	13(33 %)
Private	2	1	1	1	2	1	8 (21%)
Other KVS /NVS	2	2	2	2	2	2	12 (31%)
Total	11	6	5	5	7	5	39

The agencies involved in the in-service programme in ICT were approached during phase -1.

Fig-1:Agencies involved in INSET ICT

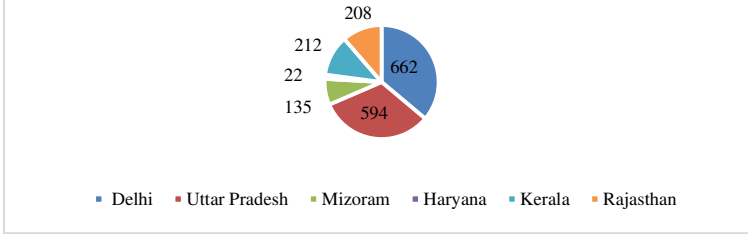


The study was conducted in two phases on a random sample of 39 agencies(4 categories) involved in in-service education and 1833 teachers from six states of India.

Table -2: Region wise Distribution of the Sample of participants:

Region	Delhi	Uttar Pradesh	Mizoram	Haryana	Kerala	Rajasthan	Total
Number of teachers	662 (36%)	594 (32%)	135 (7%)	22 (1%)	212 (12%)	208 (11%)	1833

Fig-2:Region-wise distribution of the sample



Major Findings:(A) Data collected from agencies involved in In-service programmes(INSET) ICT.

1.Type of In-service Programmes: The data collected from different agencies involved in-service programmes through the questionnaire from the head of these agencies are summarised below: The type of in-service programme were grouped into three categories namely general in-service programme with ICT component, ICT only and both . 56% of the agencies studied offered general in-service programme , 15% offered only ICT and 28% offered both to the participants.

Table 3-Type of In-service Programme

Type of INSET	Delhi	Uttar Pradesh	Mizoram	Haryana	Kerala	Rajasthan	Total
General In-service programme with ICT	8	2	3	2	3	4	**22(56%)**
ICT only	1	1		1	2	1	**6(15%)**
Both	2	2	2	2	2	1	**11(28%)**

Table4: Duration of the In-service programmes

Duration of INSET	Delhi	Uttar Pradesh	Mizoram	Haryana	Kerala	Rajasthan	Total
<10 days	3	3	4	4	3	4	**21(54%)**
10 to 20 days	8	3	1	1	4	1	**18(46%)**
>20			1				**1(3%)**

The duration of the INSET programme in ICT was studied. 54% of the programmes studied were of less than 10 days duration, 46% of them were 0f 10 to 20 days and only 3% was of more than 20 days duration.

Table No. – 5: Sessions of Training

No. of sessions of INSET per day	Delhi	Uttar Pradesh	Mizoram	Haryana	Kerala	Rajasthan	Total
1	6	3		2	2		**13(33%)**
2	3	3		3	4	1	**14(36%)**
4	2		5		1	4	**12(31%)**

33% of the inservice programmes were having one session per day. 36% of the inservice programmes were having two sessions and 31% had 4 sessions.

Table No. – 6: Level of the Training

Level of ICT	Delhi	U.P	Mizoram	Haryana	Kerala	Rajasthan	Total
Basic Literacy	3	3		1		2	**9 (23%)**
Computer skills and pedagogy integration	8	3	5	4	7	3	**30 (77%)**

23% of the in-service programme dealt with basic computer literacy and 77% of them were training teachers in the ICT integrated pedagogy. Zhang and Martinovic (2008) in the study on ICT in teacher education in Canada pointed out the need for having ICT literacy followed by ICT pedagogical content what were the actual content of the courses were further explored and the details are summarised below:

Table No. – 7: Content Covered in the Training

Content of ICT	Delhi	Uttar Pradesh	Mizoram	Haryana	Kerala	Rajasthan	Total
Computer based instruction	8	6	5	2	7	2	**30 (77%)**
Administrative tool	6	5	3	2	5	2	**23 (59%)**
Computer course ware	9	5	5	2	7	1	**29 (74%)**

Presentation tool	11	6	5	2	7	5	**36 (92%)**
Research tool	11	5	2	2	5	2	**27 (69%)**
Publishing tool	2	3	2	2	5	2	**16 (41%)**
Evaluation	5	3	5	2	5	2	**22 (56%)**
collaboration	5	3	2	2	2	2	**16 (41%)**

Computer Based Instruction: 77% of the agencies reported that they trained teachers in computer based instruction. The training is for using different applications and multi- media packages available with them.

Administrative Tool: 59% of the heads of the agencies reported that the training covered administrative aspects.

Presentation Tool: Almost all the agencies covered had MS Power point in their course. The soft ware has the potential make learning interactive and creative, that aspect was seldom covered.

Use of computers for research (69%), publication (41%), evaluation (56%) and collaboration

(41%) were areas that could be further strengthened.

B. Data collected from Participant teachers

Table:8 Level of the school taught by Participant teachers

State	**Sr. Sec. (No.)**	**%**	**Sec No.**	**%**	**Middle no.**	**%**	**Primary no.**	**%**	**Total**
Delhi	341	51.47	24	3.63	3	0.45	294	44.41	**662**
UP	195	32.83	6	1.83	180	30.30	213	35.85	**594**
Mizoram	10	7.40	120	88.88	5	3.70	0	0.00	**135**
Kerala	88	41.51	124	58.49	0	0.00	0	0.00	**212**
Rajasthan	0	0.00	0	0.00	208	100.00	0	0.00	**208**
Haryana	22	100.00	0	0.00	0	0.00	0	0.00	**22**
Total	**656**	**35.79**	**274**	**14.95**	**396**	**21.60**	**507**	**27.66**	**1833**

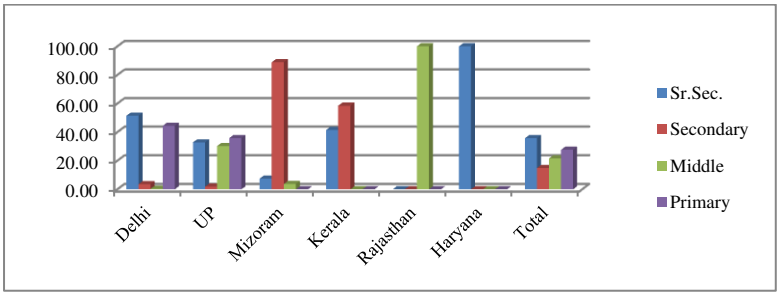


Fig.3: Level of the school taught by Participant teachers

The sample of participants from the selected states had representation of different levels of schooling such as 35.79% of senior secondary level, 14.95% of secondary level, 21.6% of middle school level and 27.66% primary level . The sample of this study did not have pre primary teachers.

Training Needs of School Teachers in ICT:

The questionnaire covered many aspects related to the ICT competencies of teachers. Only those aspects which reflected training needs are given below:

Have you ever made your own software available? The responses of the teachers to the above question are given in the table below:

Table no 9.Have you ever made your own software available?

State	Yes (n)	%	No (n)	%	Total
Delhi	68	10.27	594	89.73	662
UP	42	7.07	552	92.93	594
Mizoram	20	14.81	115	85.19	135
Kerala	36	16.98	176	83.02	212
Rajasthan	4	1.92	204	98.08	208
Haryana	0	0.00	22	100.00	22
Total	170	9.27	1663	90.73	1833

Only 9.27% ever made own software for teaching. It is important for the teacher to develop proficiency in developing software required for their teaching. New teachers may have had some exposure already regarding the apps available for developing content. As the computer applications are becoming more and user-friendly exposure given

during INSET may give the ability to tap the potential of the teacher made software for teaching.

Table No. 10. Knowledge of Programming Language

State	Yes (n)	%	No (n)	%	Total
Delhi	96	14.50	566	85.50	662
UP	48	8.08	546	91.92	594
Mizoram	30	22.22	105	77.78	135
Kerala	104	49.06	108	50.94	212
Rajasthan	0	0.00	208	100.00	208
Haryana	0	0.00	22	100.00	22
Total	278	15.17	1555	84.83	1833

Only 15.17% of the teachers had knowledge of any programming language. Kerala state teachers (49%), 8% of teachers from UP and 15% of teachers from Delhi responded that they knew programming language. Teachers should be given some basic knowledge regarding programming and exposure to use them so that they could start learning on their own as they feel motivated. Open source software is also need to include.

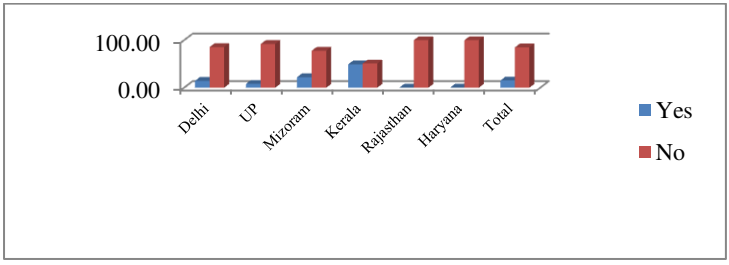


Fig. No.4 **Knowledge of programming language**

Table No. 11. Could do Blogging

State	Yes (n)	%	No (n)	%	Total
Delhi	96	14.50	566	85.50	662
UP	48	8.08	546	91.92	594
Mizoram	30	22.22	105	77.78	135
Kerala	104	49.06	108	50.94	212
Rajasthan	0	0.00	208	100.00	208
Haryana	0	0.00	22	100.00	22
Total	278	15.17	1555	84.83	1833

Table No. 12. Knew how to prevent viruses in the computer?

State	Yes (n)	%	No (n)	%	Total
Delhi	282	42.60	380	57.40	662
UP	216	36.36	378	63.64	594
Mizoram	85	62.96	50	37.04	135
Kerala	124	58.49	88	41.51	212
Rajasthan	100	48.08	108	51.92	208
Haryana	0	0.00	22	100.00	22
Total	807	44.03	1026	55.97	1833

44% of the total sample of teachers, 42% of teachers from Delhi, 36% of teachers from UP, 63% of teachers Mizoram, 58% of teachers from Kerala and 48% of Rajasthan responded that they knew how to prevent viruses.

Discussion:

The agencies involved the INSET in ICT are offering both basic computer literacy and also technology integrated pedagogy programmes. The teacher's subject specific requirements should be given more importance now. As per the finding of our study most of the teachers who were participants of INSET programmes were having basic literacy. The school should provide them the facility for using as most of the teachers who were interviewed reported that they were not having computer access. There were many maintenance-related issues also which high light the fact that basic trouble shooting should also be covered by the INSET programmes. There is also the need for introducing distance education using EDUSAT or MOOC using Moodle.

Show Casing Best Practices:

Each state covered had exceptionally brilliant use of ICT integrated teaching. Among the agencies covered IT@ school Kerala and Intel curriculum were the best due to the fact that they were making use of the potential of ICT to make learning interactive and providing for experiential learning required for the 21st century. All the KendriyaVidyalayas and Navodaya Vidyalayas covered in the study were best examples of ICT usage. The Government schools in

Malappuram District in Kerala also were using technology well in their classrooms. Subject specific software is used there by the subject teachers. The administrative support was also very good in getting the resources for these schools.

Conclusion:

In-service programmes may help teachers acquire the knowledge and skills required to effectively use ICT as a tools in facilitating learning in an increasingly ICT-pervasive learning environments that could be available in India soon due to Digital India and ICT policy in school education. The main problem to address, in the use of ICT in and for education, is the question of adequate expertise in terms of knowledge, skills and attitude on the part of the facilitators at individual, institutional and national levels. Most often teachers need basic computing skills, and skills in integrating technology with pedagogy through cyclic schedules of in-service programmes for facilitating learning and also for their professional development.

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Teacher Education in India: Some Reflections

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One of the basic questions pertaining to teacher education programme round the globe is 'what value does teacher education add to the prospective teachers' ability to face challenges of facilitating the development of critical and creative students and subsequently adults?' Various commissions and committees in India discussed at length the different issues pertaining to teacher education programme; prominent among them are professionalization of teacher education, development of integrated programmes, comprehensive colleges of education and internship.

"Teacher education refers to the policies and procedures designed to equip prospective teachers with the Knowledge, attitudes, behavior and skills they require to perform their tasks effectively in the classroom, school and wider community".

Although ideally it should be conceived of, and organized as, a seamless continuum, teacher education is often divided into these stages which may also be termed as 3 Is (**I**nitial Teacher Education, Induction & In-service):

- *initial teacher education* (a pre-service course before entering the classroom as a fully responsible teacher);
- *induction* (the process of providing training and support during the first few years of teaching or the first year in a particular school);
- *teacher development* or *continuing professional development (CPD)* (an in-service process for practicing teachers).

The present paper seeks to answer to some of the questions related to the issues with reference to the aforementioned stages.

Initial Teacher Education

Like in many countries, in India too, Initial Teacher Education (also known as pre-service teacher training) takes place largely or exclusively in institutions of Higher Education. It may be organized according to two basic models. In the 'consecutive' model, a teacher

first obtains a qualification in one or more subjects (often an undergraduate Bachelor's degree), and then studies for a further period to gain an additional qualification in teaching (this may take the form of Master's degree).

In the alternative 'concurrent' model, a student simultaneously studies both one or more academic subjects, and the ways of teaching that subject, leading to a combined Bachelor's degree and teaching credential to qualify as a teacher of that subject.

However, there is a longstanding and ongoing debate about the most appropriate term to describe these activities. The term 'teacher training' (which may give the impression that the activity involves training staff to undertake relatively routine tasks) seems to be losing ground to 'teacher education' (with its connotation of preparing staff for a professional role as a reflective practitioner).

Nonetheless, there has always been a need to innovate with different models of teacher education. Institutional capacity and capability to innovate and create are pre-requisite for the pursuit of excellence. Four year integrated Bachelor of Elementary Education (B. El. Ed.) for the preparation of elementary school education teachers offered by select affiliated colleges of University of Delhi, NCERT'S experiments with the four year integrated programme leading to the degree of B. Sc. Ed, two year B. Ed. programme and integrated M. Sc. Ed. are some of the examples in this regard. Apart from this, the revised B.Ed and M.Ed. programmes and the proposed three year B.Ed-M.Ed integrated programme which the NCTE looks forward to implementing, are expected to promote quality in education.

Significantly, the Ministry of Human Resource & Development implemented the recommendations of the Justice Verma Commission on teacher education to improve quality of teachers. The Commission has stressed for pre-entry testing of candidates for admission to teachers' education programmes; increasing investment in establishing teacher education institution; and exploring the possibility of teacher educators as visiting faculty in schools.

The poor quality of pre-service teacher education and poor subject knowledge, and poor quality of general education across the country were some of the issues raised by Justice Verma Commission in its report and strongly recommended for re-structuring and revamping the teacher education programme. The observation made by the Justice

Verma Commission also put a question mark on the teacher preparedness and the kind of curriculum we design and transact to produce skilled teachers.

Although, teacher education curriculum provides the trainees to study the foundation courses in order to understand better the Psychology and sociology of the class, they often find it difficult to deal with the children coming from diverse backgrounds. In the present ecological crisis, they also need to be educated through perspectives of gender equality, the perspectives that develop values for peace, respect the right of all and respect and value work apart from having concern for the natural resources instead of merely following the consumption patterns.

According to National Curriculum Framework for Teacher Education (NCFTE-2009), the layout of a curriculum for teacher education can be conceived as comprising three broad curricular areas: (A) Foundations of Education which include courses under three broad rubrics, namely, Learner Studies, Contemporary Studies and Educational Studies; (B) Curriculum and Pedagogy which include courses under two broad rubrics, namely, Curriculum Studies and Pedagogic Studies; and (C) School Internship leading to the development of a broad repertoire of perspective, professional capacities, teacher sensibilities and skills. Together, these areas constitute the common core curriculum for teacher education programmes across stages – pre-school, elementary, secondary and senior secondary.

Generally, Teacher Education curricula can be broken down into these blocks:

- foundational knowledge and skills—usually this area is about education-related aspects of Philosophy of Education, History, polity and economy of Education, Educational Psychology and Sociology of Education
- Content-area and methods knowledge—often also including ways of teaching and assessing a specific subject, in which case this area may overlap with the first ("foundational") area. There is increasing debate about this aspect; because it is no longer possible to know in advance what kinds of knowledge and skill pupils will need when they enter adult life, it becomes harder to know what kinds of knowledge and skill teachers should have. Increasingly, emphasis is placed upon 'transversal' or 'horizontal' skills (such as

'learning to learn' or 'social competences', which cut across traditional subject boundaries, and therefore call into question traditional ways of designing the Teacher Education curriculum (and traditional school curricula and ways of working in the classroom).

- Practice at classroom teaching or at some other form of educational practice—usually supervised and supported in some way, though not always. Practice can take the form of field observations, student teaching, or internship

The National Knowledge Commission (NKC) has observed that teachers are the most important element of the school system and the country is already facing a severe shortage of qualified and motivated school teachers at different levels. Thus the training of teachers is a major area of concern at present as both pre-service and in-service teachers are extremely inadequate and poorly managed in most states.

Much to the chagrin of the fact that with the implementation of Right to Education Act (RTE), the present teacher education programmes have come under even more severe criticism as they have failed to fulfill the objectives of NCF and the Right to Free and Compulsory Education. Apart from this, two kinds of exclusions; the exclusion of children with disabilities of different kinds and learning difficulties and the social exclusion of children from socially and economically deprived backgrounds which are prevalent in schools are largely because of an inadequate preparation of teachers to address diversity in the classroom.

Significantly, the much desired community knowledge which calls for the need of selecting and organizing subject-content and learning experiences from the community for the classroom has also been missing which has created a great vacuum between teachers and the community. Hence, there is a need to develop skills among the teachers to explore the community resources to have a meaningful curriculum transaction. Hence, the foremost step towards addressing diversity in schools should come from the curriculum itself. Involving different ethnic sports and multicultural festivals at schools would mark the beginning of an attempt to combine students from diverse backgrounds into a bond of institutional unity.

However, with the introduction of 2 years B.Ed and M.Ed programmes as recommended by justice Verma Commission and implemented by

NCTE in all the Teachers Education Institutions, it is expected that the student teachers would be provided better exposure to both theoretical knowledge and practical experiences. This would enter help them be equip with the understanding essentially needed for addressing the diversity in the classroom.

Induction

A teacher induction program can help new teachers improve practice, learn professional responsibilities and ultimately positively affect student learning. In addition to providing support to beginning teachers, these programs allow veteran teachers to reflect upon practice and can unite the learning community as each individual works toward the same goal - improving the quality of education. Induction programs also have the potential of elevating the teaching profession and fostering a collaborative learning community for all educators. These benefits can lead to a much higher rate of retention, as new educators find themselves in an environment that cultivates continual growth and success.

Despite the fact that an induction programme for any beginning teacher basically lays the foundation stone for her/him becoming an effective as well as an efficient teacher, such a practice is rarely followed in school system. The fact is a teacher once inducted into a school system simply gropes into dark for long before s/he finally gets familiar with the task assigned to her/him. This at times makes her/him burn out as for want of any support from the school, the sense of ownership slowly and gradually fades away in them.

No denying the fact, a comprehensive induction program will definitely provide a systematic structure of support for beginning teachers. The need of this type of programme becomes even more important in the situation when not only s/he but also the students are from different socio-cultural and linguistic backgrounds. Thus, if a teacher is not well informed about the school ecology and the community living in that particular district

The mentoring relationship provides the beginning teacher with an opportunity to work closely with and learn from a veteran teacher. The mentoring relationship is shaped by the activities that the beginning teacher and mentor participate in together. In order that the beginning teachers should gain an understanding of their strengths and weaknesses and to grow professionally, the school management should

therefore design such a programme which could best provide them with the opportunity of anticipatory socialization.

As teaching involves the use of a wide body of knowledge about the subject being taught, and another set of knowledge about the most effective ways to teach that subject to different kinds of learner; it therefore requires teachers to undertake a complex set of tasks every minute. Hence, many teachers experience their first years in the profession as stressful.

A distinction is sometimes made between inducting a teacher into a new school (explaining the school's vision, procedures etc), and inducting a new teacher into the teaching profession (providing the support necessary to help the beginning teacher develop a professional identity, and to further develop the basic competences that were acquired in college.)

A number of countries and states have put in place comprehensive systems of support to help beginning teachers during their first years in the profession. Elements of such a programme can include:

- Mentoring: the allocation to each beginning teacher of an experienced teacher, specifically trained as a mentor; the mentor may provide emotional and professional support and guidance; in many US states, induction is limited to the provision of a mentor, but research suggests that, in itself, it is not enough.
- A peer network: for mutual support but also for peer learning.
- input from educational experts (e.g. to help the beginning teacher relate what she learned in college with classroom reality)
- Support for the process of self-reflection that all teachers engage in (e.g. through the keeping of a journal).

Some research suggests that such programmes can increase the retention of beginning teachers in the profession; improve teaching performance; promote the teachers' personal and professional well-being.

Significantly, with the onset and proliferation of Information and Communication Technology (ICT), there is a growing demand that it be included in school education. Hence, ICT needs to become an integral part of teacher education programmes.

Continuous Professional Development (CPD)

Another important feature of any teacher education programme is the Continuous Professional Development of teachers and this could be possible when teachers are given autonomy to participate in the activities that keep their academic interest alive. Teachers should be encouraged to continue their professional development by actively participating in each of the learning activities; whether in school or outside it. This will in turn be useful in enhancing their knowledge and skills and avoiding them to be burn outs.

However the question of what knowledge, attitudes, behaviors and skills teachers should possess is the subject of much debate in many cultures. This is understandable, as teachers are entrusted with the transmission to learners of society's beliefs, attitudes and deontology, as well as of information, advice and wisdom, and with facilitating learners' acquisition of the key knowledge, attitudes and behaviors that they will need to be active in society and the economy.

The importance of teachers' professional development has increased manifold in today's context with students from socially and ethnically diverse backgrounds seeking admissions in schools. Thus today, the issue of whether or not to address diversity poses a serious question. Unless and until teachers are professionally educated to appreciate the diversity and encourage their students to get familiar with each others' cultural and ethnic differences, the very purpose of any TE Programme will be defeated.

In the advent of globalization, there is knowledge explosion all around and if a teacher is not able to keep pace with the time, s/he may find it difficult to survive. With the students coming from varied backgrounds, a teacher needs to innovate and experiment to find out some plausible strategies that may best serve the interest of if not all at least many. The teacher should update herself/himself about the content and pedagogic content knowledge.

The extent to which education authorities support this process varies, as does the effectiveness of the different approaches. A growing research base suggests that to be most effective, CPD activities should:

- be spread over time
- be specific and tuned to teachers' needs
- be collaborative

- use active learning
- include periods of practice, coaching, and follow-up
- promote reflective practice
- encourage experimentation

Apart from the above, a teacher needs to take initiative on their own for her/his self development. The 5 E's, an instructional model based on the constructivist approach to learning, says that learners, in this case, teachers, build or construct new ideas on top of their old ideas. Hence, a teacher should do away with her/his age old knowledge and keep on the lookout for 'new' by virtue of which s/he enters in her/his class with renewed zeal every day.

Each of the 5 E's describes a phase of learning, and each phase begins with the letter "E": Engage, Explore, Explain, Elaborate, and Evaluate. The 5 E's allows students and teachers to experience common activities, to use and build on prior knowledge and experience, to construct meaning, and to continually assess their understanding of a concept. Along with this, the prospective teachers as reflective practitioners need to promote active learning strategy by virtue of which the learners could learn, unlearn and relearn.

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