

नाम – डॉ. बी. व्ही. रमणा राव

विभाग – स्कूल शिक्षा

सेवा निवृत्ति दिनांक – 28.02.2025

प्रथम नियुक्ति दिनांक व स्थान – 09.07.1985, शा. उ. मा. शाला तरकेला, रायगढ

प्रथम नियुक्ति पद – व्याख्याता भौतिक शास्त्र

सेवा निवृत्ति पर पद – सहा. प्राध्यापक, उन्नत शिक्षा अध्ययन संस्थान बिलासपुर

UGC Enlisted

# EDUSEARCH

ISSN : 0976 - 1160

(Bi-annual & Bi-lingual)

PEER GROUP REVIEWED  
JOURNAL OF EDUCATIONAL RESEARCH

Volume- 8

Number - 2

October 2017



**RESEARCHERS ORGANIZATION  
BILASPUR (C.G.)**

(Regd. No. 13554/11)

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**From Editor's Desk**

Dear Friend,

We are all the residents of digital age. From 1980 onwards, with the coincidence of advent of the World Wide Web, the use of digital technology became prevalent and of common use throughout the world. The digital age began in earnest with the widespread use of the Internet.

Now the world has clearly divided into two parts, those who born prior to 1980's are digital immigrants and those who born after 1980's are digital natives. The truth is that there a generational gap between the so-called digital natives and the digital immigrants doesn't actually have to do with technology. This gap is reflecting more in schools where almost all of the teachers are either digital immigrants or out of the digital world.

Many Immigrants consider education as the process that to force as much information into students' heads as possible so they can regurgitate a list of facts at examination. Natives do not consider this an education. To Natives, education involves anything that prepares them for their future.

Today's students explore their world in an entirely new way as they interact with new technologies. With these new technologies, they speak an entirely different language, one they expect us to understand.

One major difference between Natives and Immigrants is the way we process information. Natives retrieve information and communicate with their peers very quickly and do not see the need to memorize information as much as the need to know where information can be found and how to retrieve it.

Why should students memorize when they can browse? Why learn math tables when everyone has access to a calculator? Immigrants should be willing to teach Natives how to find important information and put less emphasis on forcing the students to learn exact information.

Gone are the days when we think of Zone of Proximal Development of a child, where the distance between the actual developmental level of the child by independent problem-solving and the level of potential development as determined through problem solving under adult guidance.

Now the burning issue is that, what type of education and evaluation system we should develop so that avalanches like digital-intrusion may not affect the social and cultural heritage of this universe.

B. V. Ramana Rao

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Volume - 8

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*The prime objectives of this organization are -*

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- \* To provide a platform to the young writers for publication of their books.*
- \* To publish research journals in various subjects.*
- \* To develop and publish various research tools, scales of measurement in various subjects.*
- \* To conduct research experiments in education and other subjects.*
- \* To provide consultancy services to young researchers.*
- \* To organize national and state level seminars, conferences, workshops etc.*
- \* To conduct various projects in school and higher education fields in consultation with the apex bodies of the country.*

**Dr. B.V. Ramana Rao**  
**Secretary**  
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# Myths and Reality of ICT in Education

**Dr. Vanaja, M. \* & Rafi Mohmad \*\***

**Key Words : ICT, ICT in Education, Myth, Reality**

## Abstract

ICTs have definitely revolutionized the Teaching, Learning and Evaluation processes and Institutions now focusing on Digitalization of Classrooms. The effective utilization of computers and information technologies in the Schools, Colleges and in Universities is rapidly increasing. Recent initiatives like SWAYAM, e-Patashala, e-PG patashala and MOOCs have created a record with their massive rapid expansion. Now, this impact of ICT in education has created so many doubts in the minds of the stockholders of Education. To adjust and adopt the changes in the system because of ICTs there are various opinions. In the stockholders there are the believers who think that under the right conditions technologies can have a monumental impact on the expansion of learning opportunities to wider populations and technologies can improve the teaching/learning process, enhance higher levels of cognition, and facilitate institutional management. The skeptics question the validity or authenticity of the tools, the agnostics are not sure, the pragmatists are holding back. The technologies are changing so fast and the impact is intensive. In the light of these prevailing conditions, the article deals with some myths and realities of about ICT enabled teaching and learning process. The spectrum of myths under discussion ranges from complete rejection of ICT to their over idealization.

## Introduction

Computer and Social Networking have bought the revolution in the field of education exploring and expanding towards new extremes. *Thomas Edison*, the father of electricity and inventor of the motion picture, predicted in 1922 that “the motion picture is destined to revolutionize our educational system and ... in a few years it will supplant largely, if not entirely, the use of textbooks.” Since then high levels of excitement and expectation have been generated by every new generation of information and communication technologies (ICTs):

Compact discs and CD-ROMs, videodiscs, microcomputer-based laboratories, the Internet, virtual reality, local and wide area networks, instructional software, Macs, PCs, laptops, notebooks, educational television, voice mail, e-mail, satellite communication, VCRs, cable TV, interactive radio, etc.

*Seymour Papert* (1984) predicted that, “there won’t be schools in the future! I think the Computer will blow up the school.” People laughed at *Seymour Papert* in the 1960s, when he vividly talked about children using computers as instruments for learning and for enhancing creativity,

innovation, and “concretizing” computational thinking. The idea of an inexpensive personal computer, one for every child, like a notebook and a pencil, was then science fiction.

ICT is increasingly becoming more and more powerful tool for education and economic development. *Unwin* (2009) contends that ICT can be a catalyst by providing tools, which tutors use to improve teaching and by giving learners access to electronic media that make concepts clearer and more accessible.

*Guang* (2009) describes ICT in education as multifaceted variable. He delineated four components of ICT in education:

1. ICT as a subject(i.e.computer studies)
2. ICT as a tool to innovate teaching learning practice (i.e., Digital content multimedia teaching-learning methods, learning environments)
3. ICT as an administrative tool (i.e. education management information system (EMIS))
4. ICT as a facilitator of higher- order thinking skills (i.e. learner- centered, self-directed learning,tailored learning).

The ICT in Education voyage had just begun in India and we have started identifying Information Communication Technology as a medium. Using of technology for delivering has started in most of the developing countries, this would be a good sign, as in developed countries opportunities for education are little ahead. Availability of prospective and transformative education system is considered as a crucial factor for the development of human resources for any country, ensuring that fruits of economic growth reach the masses and the development is sustained. The thrust of global economies to emerge as the knowledge economy has also reinforced education as the key economic and business driver.

Yet almost every decision maker in every school system across the world is under tremendous pressure to provide every classroom (if not every student) with

technologies, including computers and their accessories and connectivity to the Internet. The pressures are coming from vendors, who wish to sell the most advanced technologies; from parents, who want to ensure that their children are not left behind in the technological revolution; from businesses that want to replicate in schools the dramatic impact that ICTs have had in the worlds of commerce, business, and entertainment; and from technology advocates, who see ICTs as the latest hope to reform education.

Technology then should not drive education; rather, educational goals and needs, and careful economics, must drive technology use. Only in this way can educational institutions in developing countries effectively and equitably address the key needs of the population, to help the population as a whole respond to new challenges and opportunities created by an increasingly global economy. ICTs, therefore, cannot by themselves resolve educational problems in the developing world; as such, problems are rooted in well entrenched issues of poverty, social inequality, and uneven development. What ICTs as educational tools can do, if they are used prudently, is enable developing countries to expand access to and raise the quality of education. Prudence requires careful consideration of the interacting issues that underpin ICT use in the school— policy and politics, infrastructure development, human capacity, language and content, culture, equity, cost, and not least, curriculum and pedagogy.

This is the period of Digital India initiative. The changes over last decade has resulted in bringing the information, communication technologies and latest innovations to the field of Education, which in turn effected the higher education and teacher education.

During periods of extraordinary dynamical changes of Information and communication technologies (ICT) the

most important questions, related to their use in education, are where, how and why they should be used. If technologies are treated as a subject instead of a means for the learning process, then this reduces teachers' motivation to use them. Many teachers are worried that they are not fluent in new technologies, and even if they are– they could not manage to keep abreast of their development. Trying to make up for the technological component they often forget that their power is to pass on their passion for studying, because everything else is just details. On the other hand, the effective integration of ICT in the teaching process presumes that students are “in the center” and are active. Even if educators theoretically know the advantages of active learning, they do not have an adequate experience, which could encourage them to apply this knowledge.

This poses serious challenges to teachers and teacher educators and trainers – to apply the style, which the teachers themselves are expected to apply in the classroom. According to John Dewey, Education is not a preparation for life; it is life itself. In accordance with this point of view, we should prepare teachers to reconsider the new technologies in ICT as a means for expressing their real potential in a given knowledge area.

#### **Myths of ICT in Education**

*Haddad and Draxler (2002)* note that one of the myths of ICT and education is that ‘merely providing ICTs to education transforms the learning process and merely connecting to the Internet changes the learner’s world.’ The introduction of ICT into education at all levels cannot be seen as independent of educational reform more generally, nor of the context within which this takes place. It is thus important to note that: No miracles derive from the mere presence of ICT in education; it does not, except in unusual circumstances, act as a catalyst for wider scale improvements.

Instead, ICT can be a powerful lever for change when new directions are carefully planned, staff and support. The other commonly held myths relayed to ICTs are:

#### **o ICTs are one monolithic entity:**

Decision makers frequently question the potential of technology in the singular. Technologies differ in their properties, scope, and potential. An audio technology can only capture sound, while a video technology depicts sound and motion. A CD provides multimedia digital content, while a Web version adds connectivity. Different technologies can be used for different purposes. The potential of technologies is influenced by what we use them for.

#### **o The Effects of ICTs are definite:**

Technology is only a tool: no technology can fix a bad educational philosophy or compensate for bad practice. In fact, if we are going in the wrong direction, technology will only get us there faster. Likewise, distance learning is not about distance, it is about learning. Just as we can have bad education face to face, we can have bad education at a distance. Similarly, if teaching is demonstrating and telling, and if learning is memorizing and reciting, using learning technologies and multimedia programs for this purpose will not have the desired impact. Also, if students are not asked to search and work collaboratively, and if teachers function independently, investment in connectivity will not be cost effective.

#### **o ICTs mean computers and the**

**Internet:** Under pressures to be fashionable and adopt the latest educational innovations, the temptation is to limit ICTs to the Internet and exclude other technologies such as radio, television, and print. These technologies use reception equipment that is readily available in homes, have proven to be effective and inexpensive in packaging high-quality educational materials, reach the ‘unreachable clientele’ and overcome geographical

and cultural hurdles.

**o ICTs are a substitute for schools and teachers:**

ICT-enhanced education activities should not be perceived as a substitute for conventional schools. Despite its shortcomings, the school system has been remarkable in its contribution to fulfilling basic learning needs, to skill formation, and to the preservation and evolution of cultures. We have reached the limits of this model, however, in providing high-quality education for all, anytime, anywhere, in an affordable and sustainable manner. ICTs can expand the potential of a conventional delivery system, complement its existing elements, and empower instructors to become better teachers.

**o Cutting costs by 'going digital' :**

Many people cite the falling costs of devices such as e-book readers as a reason to be optimistic about the potential for the widespread adoption of e-readers in education systems. Such optimism is certainly not misplaced. While the costs of end user devices will no doubt continue to fall, however, such costs may in the end represent only a fraction of the overall costs to an education system of providing access to digital teaching and learning materials, which also include things like content distribution (including connectivity), digital content production, and ongoing support and maintenance.

**o The content is available for free:**

It is certainly true that there is a lot of educational content in digital formats available for potential use in Indian education systems without charge. As with the falling costs of end user devices, this is cause for legitimate optimism and excitement. However, even where such content is 'free', and of high quality (however defined), it is worth considering that there are potentially many costs that must still be incurred if this content is to be

usefully made available to teachers and students. This content needs to be identified. It will need to be vetted for accuracy and appropriateness, and possibly contextualized for use within a given educational system. This content may need to be mapped against existing curricular objectives, and presented in such a way that the correspondence between individual content items and a given subject curriculum are clear to teachers and students. Where gaps exist, additional content may be required. It may need to be organized and presented in ways that are user-friendly. Teachers may need to be trained in the use of such content, and supported over time in ways that were not necessary (or apparent) when only printed textbooks were used. In addition, the content itself will need to be distributed to devices. Where this distribution cannot be done digitally – i.e. where no or insufficient connectivity exists – other means will need to be employed. Where digital distribution is technically possible because of the existence of adequate connectivity, there may still need to be investments in content management and distribution systems to enable this to occur.

**o Digital learning motivates children:**

A common rationale advocating for the use of digital teaching and learning materials is that such materials are, in and of themselves, naturally motivating for students, and so will increase natural motivation for learning. Beyond an initial stage of excitement that typically characterizes the deployments of new technologies in schools, the research literature is decidedly mixed on the extent to which digital materials motivate students to learn, and the extent to which this motivation results in better learning outcomes. Some content may motivate learners, some approaches to the use of this content by teachers may

motivate learners – and others may not. Such rationales are often linked, explicitly or implicitly, to the concept of young people as ‘digital natives’, i.e. that youth are increasingly living in a world where technology use is the norm, and they naturally take to and understand how to integrate the use of technology as part of their learning.

**o E-books can replace our textbooks:** As Nicholas Negroponte (1995) has famously opined in *Being Digital*, “the change from atoms to bits is irrevocable and unstoppable.” That said, while it might eventually be true that digital textbooks will eventually largely replace printed textbooks, this transition will take many years. Even where and as this ‘replacement’ becomes possible, 100% substitution is unlikely. Even the most devoted digital enthusiasts concede that there are certain affordances of the technology of the printed book (its portability, longevity, ability to be physically altered, ability to function without electricity) that may not be at hand when using e-books and other digital teaching and learning resources. Replacing the printed with the digital is not a simple ‘apples to apples’ comparison. When utilizing digital learning materials, you are often doing something -in fact many things- that are quite different than is the case when utilizing only traditional printed materials. Plans and policies meant to facilitate the simple replacement of printed with digital educational materials may not fully allow education systems, and the students and teachers who are at the heart of such systems, to take full advantage of the potentially transformational affordances that are available when materials are presented in digital formats. The inadequacies of this comparison go both ways, however; some currently proposed policies and plans meant to do away with printed materials completely may be missing part of the larger picture as well.

**o 21st-century skills require 21st-century technologies:** The modern world uses e-mail, PowerPoint, and filing systems. Computers teach you those skills. This is bad reasoning of the kind that, hopefully, genuine 21st-century skills wouldn’t allow. What exactly are the “21st-century skills” that successful citizens need? Some people define them as the 3 Rs and the 4 Cs (critical thinking, communication, collaboration, and creativity). Of course, the tools that people use at work and at home have changed, but the use of these tools is easy to learn compared with the deep ability to think and work effectively.

**o A recipe for good teaching exists:** We try to demonstrate (not to “preach”) our understanding of “good teaching”. However, we often face reactions of the kind: You are wasting our time. Just tell us what we need to know so that we can write it down. Then you can test us on this... Such reactions are not incidental and paradoxically occur even in courses described as Interactive teaching methods. Some of the participants did not realize that the number of written pages during the lectures would hardly provoke an active attitude of the students. To achieve this they themselves had to experience what it is to be active in the role of a student.

**o Evaluation IT skills is by multiple-choice tests:** It is true, that teachers have a quota – the number of ratings per term for any style of examination (written or oral). In addition, the research recommends using tests as means of adequate and trustful evaluation. However, what is the purpose of evaluation – to reach required standards or to rate students’ achievements?

We do not deny the test examination in principle, but it is suitable only in specific cases, such as the level of mastering the terminology. The real

problem arises when someone tries to rate skills or creative work. This problem is quite evident in secondary and high school level where there are few terms and in order to reach the quota for the number of ratings teachers use tests to evaluate specific technical skills. Unfortunately, the actual result is that the true achievements of the students are evaluated inadequately.

o **ICT obstructs professionalism:**

Teachers, who feel very self-confident with their subjects and who prefer the role of a “guru” share this adjustment. Such teachers enjoy the feeling of a complete control over the situation (the class, the students’ reactions, the educational methods and models). Thus, they see the ICT in a class setting as threatening their authority and professionalism rather than enriching the teaching/learning process.

Definitely, it is not required to apply ICT in every situation. Actually, they should be used only when the teachers are sure that they can be more effective with ICT. This enforces teachers to rethink the specific problems and the various approaches to solving them so that the new technologies add to the traditional teaching process.

Such enrichment could be achieved even if the teacher is not fluent with all technical details. It is enough that he can “navigate” towards a resolution in every situation even by involving students as technical advisors. However, practical observations show that the lack of adequate technical competence prevents teachers from daring to apply ICT in their subjects. They do not have experience in situations when they would search for answers together with students, or even leave some questions unanswered. Thus, instead of gaining freedom and self-esteem due to the convenience for searching information on-line, they actually lose self-confidence.

o **The good teacher should know everything:**

Teachers often think that it is important to know all the details of given software product (programming environment, software application, and package) in order to teach with/about it. Surprisingly they think so even if their “knowledge” is based mainly on procedures learned by heart (e.g. open this menu item and click on that option). At the beginning of the courses most participants wanted to learn a specific product (even specific version). It took them some time to realize that the principles and the ideas are much more important than all other details, which students can discover on their own. One of the biggest benefits of teaching in an ICT enhanced environment is that educators shouldn’t feel embarrassed if they do not know the answer of a problem as long as they know how to find a solution. In a nutshell – the more you know, the easier it is to say I don’t know. Another serious problem for teacher is considering the ICT as an end in itself.

o **Students know more than their teachers:**

This belief is shared not only by parents, but also by policy makers. What is actually meant is that children are better accustomed to experimenting with new technologies, they are more skillful using peripheral devices and they are not afraid of making mistakes. As a result, many teachers doubt if they are more competent than their students are. When we talk about teacher’s competencies, we must clearly define what we mean by this. In our rapidly changing society, the demand for competences is constantly changing. So, it is important that the key competences are defined in such a way that they can keep up with change.

The reason of using ICT in education is not the presentation of facts and their reproduction by students. The most important role of technology is to

support students to generate, justify and improve their ideas. Some technological tricks could be known by some students, but they lack the teacher's experience as a personality, as a specialist in a given domain and as a member of the society.

**o I am an innovative teacher, because I**

**use Power Point:** During the relatively short courses for basic computer skills teachers use the popular Microsoft products Word, Excel and PowerPoint. Teachers assume that computer presentations guarantee students' interest. Even if the information is dynamic and special effects are being used, this is often at the expense of the content. We have seen math lessons where the presentation contains scanned pages from a math textbook or snapshots of some dynamic geometry software (instead of using the software itself), the students being much less active compared to a chalk-talk on the same topic.

It should be emphasized that no textbook or software per se could guarantee successful teaching/learning. We have witnessed very different lessons based on the same textbooks and software. The difference comes from the teaching style – student-centered or teacher-centered. The role of the teacher in forming the spirit of guided discovery learning is very essential. It is true that students must know how to reach the answer of a problem, but life is not only answers. It is more important to be able to formulate original questions whose answers could be a matter of future investigations. This exploratory spirit can be applied in various subjects (mathematics, arts, languages, etc.) In the information era, it is crucial for the teachers to realize their role of tutors and role models. Their most important task is to cultivate proper attitude towards technologies and their applications. For many of them,

however, the next principle still holds:

**o In the information age the students' culture and behavior are not up to us:**

We often hear teachers and parents saying that their children know everything about computers. And somehow they are not impressed when the very same children: push away classmates in order to enter the computer room before them; use on-line material without permission and citation; initiate or resend chain letters to others; demonstrate their hacking and cracking skills; do not use proper language and behavior in communications; play computer games all the night at the expense of their health and duties; visit (or transmit information) about dangerous Internet sites. And then the technical IT skills become less important than the piety for knowledge and life-long learning; the skills for searching information and for collaborative team work. These are all qualities that every good teacher should possess before getting technical IT qualification. But if it is so clear what a good teacher is:

**o Technology allows interactive, adaptive, constructivist, student-centered learning:**

All of that may be true, but without directed motivation of the student, no sustained learning actually happens, with or without technology. Good teachers are interactive, adaptive, constructivist, student-centered, but on top of all of that, they are also capable of something that no technology for the near future can do: generate ongoing motivation in students. If education only required an interactive, adaptive, constructivist, student-centered, medium, then the combination of a Software and an encyclopedia ought to be sufficient for education.

**o Teachers can develop interest with technology than with textbooks:**

Nevertheless, the novelty factor of most



technologies quickly wears off, and those which do not tend to turn viewers into zombies rather than engaged learners. In addition, this comment is a real insult to good teachers everywhere. Good teachers are exactly those who can engage students creatively, regardless of the aids available to them. Technology might amplify the impact of good teachers, but it won't fix bad teaching.

**o Teachers are expensive:** It is exactly because teachers are absent or poorly trained that low-cost technology is a good alternative. Low-cost technologies are not so low cost when total cost of ownership is taken into account and put in the economic context of low-income schools. Furthermore, technology cannot fix broken educational systems. If teachers are absent or poorly trained, the only proper solution is to invest in better teachers, better training, and better administration... even if it's expensive.

**o It's time for something new:**

**Technology :** Technology has never fixed a broken educational system, so if anything is getting old, it's the attempt to patch bad education with technology. If other efforts aren't working, maybe the school system needs to be thrown out and rebuilt from the ground up, as Qatar recently did with its education ministry. There are plenty of new things to try that don't require new technology.

**o India is simply not ready for digital**

**teaching and learning materials:** The challenges facing many education systems in India, to say nothing of the needs of learners themselves, are often considerable. Even should we choose to adopt such a construct, there is no denying that there are many places, where digital teaching and learning materials have been in use in various ways – in some cases for quite a while. The use of low-cost e-reading devices,

of computers and laptops and national educational portals – while these may not be the norm for most students, they are a reality for many.

**o If we don't act now, we will fall**

**behind:** One common theme that animates many decisions to explore the use of digital teaching and learning materials is that education systems, which do not embrace the use of technology will 'suffer' in comparison to those in other countries, and the competitiveness of the country itself may be eroded over time as a result. Rhetoric of this sort is often invoked by politicians to garner support for related initiatives – aided in some instances by vendors eager to provide 'solutions' to 'problems' that policymakers have not always clearly defined, or perhaps even in some cases understood. While there may be some truth to such worries, there is often a danger that such concerns can lead to hasty, ill-conceived or inadequately considered plans to quickly introduce new technologies into schools. Decisions about the introduction of, or transition to, the use of digital teaching and learning materials are not ones to be taken lightly, or quickly.

### **Conclusion**

ICT can certainly help in disseminating educational content, and facilitate remote learning. It can overcome challenges like teacher shortage and student dropout—and bridge the digital divide. Those thinking about tapping the opportunities in the education sector should also take note of the typical challenges. Technology is much like every other tool in a classroom: some people see it as a benefit and others see it as a distraction. Math teachers used to complain that calculators were not appropriate for students to use in class because they made problems "too easy", whereas now it is the norm to use this kind of technology in learning. It's not as simple as installing a PC and running

a CBT (Computer Based Training) package. "There are many challenges when setting up projects at each level. One challenge is the consistency in the way teaching is done. The second challenge is that, small schools & colleges with limited staff. The teacher plays multiple roles—as a teacher, administrator, principal and one who is highly respected at the local community level. So the challenge lies in consistency in the delivery of education and also in evaluation. In that context digital

technology gives you the ability to bring about a standard in the delivery of education." Language and contextualization is one of the bigger challenges." The teachers and students should be able to relate to the content, rather than just mug it up. To "tech" or not to "tech" education is, therefore, not the question. The real question is how to harvest the power of ICTs to make education relevant, responsive, and effective for school settings and lifelong learning.

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|---------------------------|------------|-------------|-------------|
| Article Received on       | 08.10.2017 | Reviewed on | 18 .10.2017 |
| Observations reflected on | 20.10.2017 | Modified on | 22.10.2017  |

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# Information and Communication Technology as a Tool for Learning

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**Key Words :** *ICT, Accessibility and Usage of ICT, Quality in Learning.*

## Abstract

*Information and communication technology (ICT) is now actively diffused in every aspect of our daily lives and education is not apart from this. Students' learning is not limited only inside the classroom or school boundary but outside of the school boundary (community, experience, home etc.) also. In this era of technology every individual is using ICT in their everyday life and for students it becomes an important tool for quality development in their learning. As now ICT is already reached to everyone's house, it highly matters how the students are using ICT in their daily life as well as for their learning purposes also. From the personal experiences of the researcher, it is found that, the students who are studying in higher secondary classes are very much familiar with the use of ICTs. So it would be worthy to know i) what kinds of ICT resources are available at their home? ii) How do they use those ICTs at their home? and iii) How do they use ICT for improving their learning? For finding out the answers of these questions the researchers used a self developed questionnaire and collected data from 100 (50 girls and 50 boys) school students studying in class 11<sup>th</sup> in different government and private schools. The data were analyzed qualitative as well as quantitatively. The results revealed that maximum no. of students use ICTs in their daily life but very few students apply it for study purpose.*

## Introduction

Technology is already occupied the central position all walks of life in 21<sup>st</sup> century. Nations are now giving importance to develop the ways for the improvement of knowledge and it's sharing by creating new technologies day by day. It is now inseparably related our life and education is not apart from this. At present time ICT is actively used in every aspect in our life and for this reason Govt. of India inculcated ICT in our curriculum. Meenakshi (2013) has listed

the aims and objectives of ICT implementation in education:

- To implement the principle of life-long learning / education.
- To increase a variety of educational services and medium / method.
- To promote equal opportunities to obtain education and information.
- To develop a system of collecting and disseminating educational information.
- To promote technology literacy of all citizens, especially for students.
- To develop distance education with national contents.

7) To promote the traditions of learning by developing of learning skills, by giving information regarding spreading out of optional education, knowledge about open source of education etc.

Incorporation of ICT in teaching – learning process makes a bridge between people and information of all fields. As we all know that learning is not only limited to the boundary of classroom it is beyond it. This may be our society, our peer group, our home. Anything, from which we can collect information and learn as well. So as a result we collect knowledge from everywhere.

### **Information and Communication Technology (ICT):**

Now, ICT becomes an inseparable part of our lives. In education, various products are used such as teleconferencing, email, audio conferencing, television lessons, audiocassettes and CD ROMs etc. (*Amin, n.d.*). It has the potential to accelerate, motivate, and engage students for learning more and gain knowledge beyond their text books. It makes the students comfort learners and knowledgeable of every aspect of the world. Like India, all the developing countries are using largely ICTs to increase access to improve the quality of education (*Patra, 2014*). It is helpful not only for students, but also for teachers in various ways. *Patra (2014)* listed ICT benefits for students: like,

- Increase ICT confidence amongst students motivates them to use the Internet at home for schoolwork and make their curiosity fulfill.
- It can improve accessibility for students to education,
- Students with multiple learning disabilities can easily communicate with more people,
- Visually impaired students using the internet can access information along their sighted peers.

### **Quality education:**

The quest for quality is the characteristics of the entire history of

human civilization acting as a driving force behind all human endeavors (*Hossain, 2010*). From previous studies, it is largely agreed that infrastructure, trained teachers, e-literacy or stand-alone computer lessons though necessary are not sufficient (*Dasgupta & KPN, 2012*). Quality is something that stares at you do not fail to recognize but is difficult to define. The Oxford English dictionary. 1970, defined quality as “the nature, kind or character (of something) now restricted to cases in which there is comparison (expressed or implied) with other thing of the same kind; the degree of excellence etc possessed by things.

This shows the totality of feature and the characteristics of a product. In recent trends ICT is like a new device and it increases the scope of developing as well as increasing the quality in every field. As it is now incorporated in educational field, so all of us are hoping that the quality of education will also increase very fast like other developed countries, which is really very necessary in 21<sup>st</sup> century.

ICTs can improve the eminence of education in several ways:

- By increasing the motivation of the learner.
- By engaging the students for more learning,
- By facilitating the acquisition of basic skills, and
- By enhancing teacher training.

ICTs are also known as transformational tools which when used appropriately; it can promote the shift to a learner-cantered environment (*Meenakshi, 2013*). This will be possible only if we can use ICT effectively. Regarding this *Amin (n.d.)* stated that ICT can improve the quality in education if we provide curricular support in almost all subject areas.

### **Need of the Study:**

In this 21<sup>st</sup> century, Information communications and technology (ICT) is playing a very important role which we

can't be overlooked. In modern era where only education is not sufficient there should be quality in it. For better quality, there is a need to add some extra knowledge, creativity, additional skill, information etc. It is not possible to know everything by reading text books only or by attending classes. In this era of technology it becomes very easy to collect information and gaining knowledge as well. So the knowledge and use of ICT becomes very important to walk in the developed and developing countries also. ICT is now adopted by all developed and developing countries (like India). But only adopting is not sufficient for the quality enhancement. Here accessibility as well as proper usage is very necessary.

As we know that everything contains two sides. One is good and one is bad. It depends upon how you are using it. Similarly ICT follows the same thing. Now a day every individual is very much familiar with ICT but it will be worthy of knowing how ICT is using now a day.

Higher secondary classes are the base for entering into the higher education. From here the students starts to predict their future. As ICT is already included everywhere, so they should know well of its better and good use especially in educational field. After school, students spend maximum time at their home so they must be provided proper accessibility and opportunity to use ICT there.

Hence there is a need to know

- i) what kind of ICT resources are available at their home?
- ii) How do they use those ICTs at their home for learning? and
- iii) How do they use ICT for improving their learning?

For this purpose the following objectives were framed.

#### **Objectives:**

- 1) To study the ICT resources available at home and its use in learning purpose by the students studying in higher secondary classes in Bilaspur.

- 2) To study the ways of ICT usage of higher secondary students for their better learning.

- 3) To compare ICT usage among the students studying in higher secondary classes with reference to gender.

#### **Hypothesis:**

For the study, following hypothesis was formed;

**H<sub>0</sub>1:** There will be no significant difference in the mean scores of ICT usage between male and female higher secondary students.

#### **Methodology Of The Study:**

##### **Sample:**

For the present investigation, students studying in class 11th in different government schools in Bilaspur, are selected as sample by the use purposive sampling technique. Total 100 students were taken as sample for the present study.

##### **Instrument:**

The researchers used a self developed questionnaire on ICT accessibility and usage and took interview for collecting data from the students.

##### **Method:**

Looking at the nature of the objectives and collected data, qualitative as well quantitative research methodology is used for the present investigation. For the first and second objective qualitative analysis is applied and quantitative analysis is applied for the next.

#### **Data Analysis :**

- 1) Objective 1: To study the ICT resources available at home and its use in learning purpose by the students studying in higher secondary classes in Bilaspur.

For this objective, 4 dimensions were decided by the researchers and these are: availability of computers, smart phones, internet facility and television & DVD and the responses were collected in the form of 'yes' and 'no'. And for the second part, open ended questions were given.

The percentage analysis of the responses is shown in table 1.

**Table 1**ICT resources available and its usage  
at home

| Y/N | Availability<br>of computer | Smart<br>phone | Internet<br>facility | TV &<br>DVD |
|-----|-----------------------------|----------------|----------------------|-------------|
| Yes | 31                          | 65             | 70                   | 89          |
| No  | 69                          | 35             | 30                   | 11          |

The above table is showing that, 31 % students responded that they have computer at their home. But not a single student uses it for their learning purpose. They prefer to use it as entertainment purpose. Like: playing games, listening songs, painting, watching movies and videos etc. the rest 69 students who have no computer at their home they use it in internet café for entertainment only.

Actually they don't know the use of computers for learning purpose and nobody taught them the use of computer for their learning.

For the second dimension, 65% students said that they have smart phones at their home. They are very much familiar to use it. Among these 65 students few students use it as their learning purpose. Usually they use it for sharing the notes, some information regarding school, content taught in the classroom etc. and very few students use it for discussion about any topic. Otherwise they use it for doing messages in whatsapp, watching online videos, playing games etc. the other 35 students who have no smart phones at their home but they use key pad phone for talking with their friends.

For internet facility, 70% students responded that they have internet facility. Maximum of them are very much familiar of using it. They mainly use internet for downloading songs, videos, doing facebook, Whatsapp etc. Nobody knows how to use internet for learning purpose. *Zhao and Cziko (2001)* also stated that teachers should introduce ICT in their classroom without any hesitation. It will motivate the students to use ICT in their learning. The students who have no

internet facility at their home but use it in internet café but not study purpose. It is only used for doing facebook, chat etc. For the next dimension, 89% students said that they have television at their home and they are very much friendly of handling it. They use TV for entertainment only. They are not at all interested to use it for learning purpose specially the girls. They watch movies, serials, cartoons, cricket and other games etc. They don't use it for their learning purpose and not at all interested to watch those channels which are related to education.

From the above it can be said that the students know about ICT but they do not know its use it is a learning tool. So there is a need to aware them for the better use of ICT as a tool for their learning purpose. 2) Objective 2: To study the ways of ICT usage of higher secondary students for their better learning.

For this objective we interviewed the students and collected their responses. After interviewing the students, it is found that only some students use ICT for their better learning. They sometimes use it for sharing notes by Whatsapp. Now a day it is the easiest way to share messages, pictures etc.

By using it they can get the materials which are taught in the classroom and what questions were given by the teacher. This is very helpful for the student when any student is absent on a particular day or anything is missed by the student.

They sometimes use cell phone to discuss any topic for their better learning. Some students told that they use online dictionary when they are unable to find out the meaning of any particular word which is difficult to them. It's a very good habit to use to use ICT.

Few students told that they use Facebook for the purpose of entertainment but at the similar time they also get some knowledge from there. *Yunus & Salehi (2012)* in their study found

that facebook group is an effective tool to improve writing skill among students.

It is seeing that very few students use ICT as a tool in their study purpose. If teachers and parents give some time to guide them about various use of ICT in education then only they can use ICT more effectively.

As Internet becomes an important source of knowledge so it's the duty of parents and teachers to take the responsibility to make the students' aware about the use of internet for their better learning. *Amin (n.d.)* also explained the use of internet is good way of learning.

3) Objective 3: To compare ICT usage among the students studying in higher secondary classes with reference to gender.

For this objective one hypothesis is framed as

H<sub>0</sub>1: There will be no significant difference in the mean scores of ICT usage between male and female higher secondary students.

The result of the t- test against the hypothesis is given as follows:

**Table 2**

Result of Test of significance of difference between mean scores of ICT usage of male and female higher secondary students.

|             | Male  | Female | t-Value           |
|-------------|-------|--------|-------------------|
| <b>Mean</b> | 19.62 | 18.54  | 0.751             |
| <b>SD</b>   | 8.37  | 5.75   | $t_{0.05} = 1.98$ |
| <b>N</b>    | 50    | 50     | df = 98           |

The table 2; shows that mean, S.D. calculated for the above groups are 19.62 & 8.37 and 18.54 & 5.75 for male and female higher secondary students in ICT usage for better learning. The t-value comes to be 0.75 which is lesser than the tabulated value at 0.05 level of significance ( $t_{0.05} = 1.98$  for d.f. = 98). Thus the null hypothesis is accepted since the mean of ICT usage for male students is significantly higher than those of female students. It reveals clearly that female

students use less ICT for their better learning.

As the girls are mainly involved in household works as well as not so much motivated for learning by their parents, as a result their interest for learning is reducing. Though they have facilities for using ICTs at their home still they don't use it appropriately as a tool for learning purpose. From their interview it is also found that they have very less interest in using ICT for their better learning. They only use ICT for entertainment purpose. So there is need to influence the girls to use ICT as its knowledge is very necessary for being a part of this modern era.

#### **Conclusion:**

From the above it is found that students are familiar with the use of ICT but very few students know how to use it for their better learning. Computer, smart phone, TV all is already accessible at home but due to lack of instruction and motivation they are unable to use it for learning. If the teachers and parents take one step to guide and motivate the students to use ICT for educational purpose then only the aim of providing quality education with the help of ICT will be fulfill. With this, the students will also be able to use ICT for their better learning. If we do not start this work early, it will be very late for the students because after crossing the school boundary, they will enter into higher education and at that time knowledge of ICT will be very necessary and it will take time to start learning from the basic level.

#### **Implication of the Study**

The duty of the teachers is to aware students about the use of ICT and motivate to use ICT as a tool for learning purpose.

If the teachers use ICT during their teaching it will help to motivate the students to use ICT as a tool in their learning and it will also help to stop misuse of ICT.

Though there was no gender difference in the usage of ICT with reference to gender, but female students having low mean scores. Instead of involving them more in household works, if we provide them ample time for their learning and the use of ICT as a tool for their betterment in learning, then only it will be possible for the appropriate use of ICT for better learning.

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| Article Received on       | 08.10.2017 | Reviewed on | 18 .10.2017 |
| Observations reflected on | 20.10.2017 | Modified on | 22.10.2017  |

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## ICT and Education

**Dr. Manish Bhatnagar \***

**Key Words : ICT , Education**

### **Abstract**

*Information and Communication Technologies are double-edged swords. They allow people to contact one another and exchange ideas very easily in order to create communities built around common interests and common causes. New technologies undoubtedly can be used for enhancing student learning. It is hoped that educators will embrace these affordances, while continuing to build on the long-established body of evidence about effective learning and teaching practices in education. In school education move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher-order skills. Some possibilities of future are also suggests in this paper.*

### **Introduction**

Students have a diversity of experience with digital technologies, and have limited time and resources for the adoption of new technologies. Therefore, it is vital to only adopt technologies for which there is good evidence that learning benefits will be substantial and can be well integrated into a curriculum. Digital technologies can have learning benefits, including: (i) the ability to download lecture recordings, so that content can be reviewed; and (ii) access to library databases and e-journals, so that information can be researched and appraised. Both the logistical and learning benefits originate from well-established core infrastructure provided by the institution, such as a centralised learning management system (LMS) platform, a library website, and free Wi-

Fi access (assuming students have internet-enabled devices).

A very important factor impelling change has been the technological explosion, particularly in the area of ICT (Information and Communication Technologies). Such technologies are double-edged swords. They allow people to contact one another and exchange ideas very easily in order to create communities built around common interests and common causes. They also make it possible for global corporations to move billions of dollars around the world with the click of a button.

This gives them tremendous power over local and national economies, especially in our developing country. Specific Proposals for the School System A paradigm shift has to be made regarding the notion of the teacher's role. A teacher

has to move from being a “teacher” to being a facilitator or guide. This means an emphasis on the learning culture rather than on the use of technology. One of the key concepts that should be kept in mind here is flexibility, as the appropriate use of facilities and the achievement of growth would be impossible without it. We need to pay special attention to the continuing education of in-service teachers.

**Technology use is ultimately good.**

- ◆ All learners are excited and comfortable about the use of technology.
- ◆ Technology use in classrooms disturbs the ecology and the dynamics of teaching.
- ◆ Technology use raises questions for teachers to answer about their own beliefs.
- ◆ Technology use changes a teacher’s belief about teaching.
- ◆ Technology use leads to change.

**How Technology can Impact Pedagogy**

In an analysis of the contributions of new technologies to the teaching and learning process in elementary schools, *Grégoire et al* (1996) provided the following findings with respect to student learning:

- ◆ New technologies can stimulate the development of intellectual skills.
- ◆ New technologies can contribute to ways of learning knowledge, skills and attitudes, although this is dependent on previously acquired knowledge and the type of learning activity.
- ◆ New technologies spur ‘spontaneous interest’ more than traditional approaches.
- ◆ Students using new technologies concentrate more than students in traditional settings.
- ◆ New technologies help spur a research spirit within students.
- ◆ New technologies promote collaborative learning.

According to the national focus group on education technology “Revitalizing and reorienting existing resources at the risk of repeating ourselves, the Focus Group

feels that it must emphasize that, while the macro attempts of the disseminative media have had limited effects, they have nevertheless led to the establishment of a large number of institutions and facilities, the founding of nationwide networks, and the emergence of trained professional and creative manpower in the area of ET. The challenge before us is to work out appropriate modes of re-engineering so that they can constitute a powerful and effective system.

**Advantages of inculcating ICT in Education**

Technology based institutions play important role in imparting education. They produce audio and video materials, do action research, documentation, and assessment of innovative practices; undertake the in-service training of teachers; network with nationwide efforts in education and evaluation research; develop models for interactive classes, interactive multimedia, teleconferencing, and video conferencing; and lead the process whereby materials can be generated by teachers, parents, and children at every level.

In recent years, ICT and the Internet have emerged as dependable media of interaction. Unlike the broadcast media, the Internet can facilitate the participation of the periphery in an eminently democratic discourse, which can be empowering. And if properly deployed, quality concerns hitherto forced by economic and power considerations to be confined to the haves can now be within the reach of everyone. The need of the hour is, therefore, to recognise this potential, promote universal access, facilitate participatory forums, and develop communities and interest groups. Left to market forces alone, the reach is bound to remain limited. The Internet can be a sound investment for continuous on-demand teacher training and support, research and content repositories, value-added distance education, and online campuses aimed

at increasing the access, equity, and quality of education.

The model of education prevalent today presumes the existence of groups endowed with abilities, knowledge, and skills, which at times even subsume the right values, and which therefore acquire the mandate to educate. This separation of the centre and the periphery has led to the alienation and disempowerment of large communities of people. The fact that we continue to invest in adult education, that we continue to grapple with the problem of dropouts, that we continue to deal with issues relating to the provision of even minimum facilities can be traced largely to this chasm. Both for logical reasons and as a moral compulsion, it has become necessary to strengthen multiple, albeit shifting, canterers. The challenge of population alluded to earlier can only be met if we overcome this canter dominant thinking. ICT plays important role in different fields as below.

#### **Systemic Reforms**

- Ensure that technology is used in an equitable and democratic manner to enhance the self-worth and self-image of the poor and the disadvantaged.
- Counter the tendency to centralize; promote plurality and diversity.
- Ensure opportunities for autonomous content generation by diverse communities.
- Shift focus from fixed to flexible curricula with competencies and skills identified rather than specific factual content.
- Deploy ET to enhance open education, which implies openness in curriculum transactions.
- Work towards transforming all schools into ICT-rich environments.

#### **Refreshing the skills of in-service teachers**

- Create a system of lifelong professional development and support, especially of educational leaders and managers such as headmasters and principals.

- Encourage ICT literacy for official and personal use to increase comfort and later enhance creativity in educational work.
- Support the development of and nurture teachers' self-help groups / professional development groups on the ground as well as online.

#### **Pre-service teacher education**

- Introduce teachers to flexible models of reaching curriculum goals.
- Introduce use of media and technology enabled methods of learning, making it inherent and embedded in the teaching-learning process of teachers.
- Train teachers to evaluate and integrate available materials into the learning process.
- Enable trainee teachers to access sources of knowledge and to create knowledge.

The foremost challenge is to put in place a system of lifelong professional development and support. This has to replace the one-shot touch-and-go interaction, loaded with theory and almost no practice, into which the present teacher-preparation programs have degenerated. Even while we set out to accomplish this goal, revamping the ET component of the course requires immediate attention. As long as ET is used in isolation from the other components related to teaching learning, it will fail to convince a teacher about the significance of her role in engineering the teaching-learning situation and the importance of making it a more meaningful experience for both herself and her pupils.

In school education move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher-order skills.

- Enable students to access sources of knowledge, interpret them, and create knowledge rather than be passive users.
- Promote flexible models of curriculum transaction.

- Promote individual learning styles.
- Encourage use of flexible curriculum content, at least in primary education, and flexible models of evaluation.

Insights gained from various experiments aimed at reforming the school environment point towards the need for reform both in the system and within the classroom.

#### **In research**

Create a framework to identify the generic skills (problem identification and troubleshooting, for instance) needed for the new initiatives to be undertaken in ET. Acquire knowledge about how learning takes place in ICT-rich learning environments, optimising learning paths for learners with different learning styles coming from a variety of social backgrounds, including gender differences. Examine possibilities of adopting mobile technologies for learning purposes.

#### **Social Networking Sites**

Social Networking Sites SNS, such as Facebook and Twitter, have both been suggested as vehicles for promoting academic engagement with a digitally proficient cohort of students. The use of Facebook integrated with learning resources and the curriculum may enhance student satisfaction. With social media, students are able to supplement formal coursework requirements with an interface that they are already familiar with. Many university students use Facebook daily. Students also noted that Facebook helped them by making visible shared issues with conceptual knowledge. Academics were also able to recognize issues that students were experiencing by accessing the Facebook site. In making the transition between information technology's contributions to learning and its contributions to teaching in the settings under study, Grégoire et al make two observations of significance for educational leaders: This skill and attitude are largely dependent on the training teaching staff have received in this area.

With respect to teachers, Grégoire et al (1996) reported the following:

- New technologies permit teachers to avail themselves of new information sources.
- New technologies facilitate collaboration among teachers and others.
- New technologies seem to lead teachers to develop lessons with more authentic tasks and collaboration among students.
- New technologies, used appropriately, result in a shift in teacher role to guide or mentor who interacts with students more than in a traditional environment.
- Teachers employing new technologies shift their emphasis on learning to higher-order cognitive skills.
- New technologies foster more demanding assessment methods and student self-assessment.
- New technologies facilitate the use of more, and more frequent, formative assessment. Significant Differences were found in different areas after the regular use of technology by students pursuing their learning process.
- students initially felt less in control of their learning
- students came to regard the devices as less useful for note taking
- they recognised their need for assistance in using the pocket PC
- the possibility of doing group work was viewed more positively
- they saw physics as slightly more theoretical and less practical

These changes reflect the fact that that students take up the technology with great enthusiasm and become realists fairly quickly.

#### **Possibilities for the Future**

Computers are programmable devices. This very fact makes it possible for users to make demands on these machines. This implies two things; first, that the computer ought to be capable of responding to intuitive demands, and

second, that the user communicates in a language that the computer can interpret. Most software tools are designed with specific uses in mind. While this allows an ordinary user to concentrate on the task at hand, it is normally not flexible enough to respond to the different demands of the user. Most computer education programmes degenerate into teaching students the art of punching the right buttons, which ends up making them glorified data-entry operators. 'Open Source' shows a way to achieve this goal, providing access to the source code of software.

The creative potential of the computer, and the liberating potential of the Internet, can only be unleashed when we actively make these kinds of demands of these technologies. The students of the future should be oriented to this possibility, allowing them to stand their ground amidst the technology-mediated

onslaughts of the modern world. Integrating ICT into education will require that these aspects of the technology are catered to as a whole.

New technologies undoubtedly offer many affordances for enhancing student learning. It is hoped that educators will embrace these affordances, while continuing to build on the long-established body of evidence about effective learning and teaching practices in education.

Hence, digital technologies will continue to have a critical and vital role in the teaching and learning of parasitology. As more sophisticated technologies and data-driven systems become available, a consortium of experts could be a leading body to advise on which digital technologies will be beneficial for competency based, self-regulated, learner-centred teaching and learning of parasitology.

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|---------------------------|------------|-------------|------------|
| Article Received on       | 22.09.2017 | Reviewed on | 26.09.2017 |
| Observations reflected on | 27.09.2017 | Modified on | 01.10.2017 |

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# **ICT and Multimedia in 21st Century's Teacher Education**

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**Key Words : ICT, Teacher Training**

## **Abstract**

*ICT has become as an inseparable part of our life and society. ICT is now broadly being used in educational world. Teachers use ICT for making teaching learning process easy and interesting. A competent teacher has to be skillful for making successful teaching. So development and increase of skills and competencies of teacher required knowledge of ICT and Science & Technology. The knowledge of ICT is very much essential for the both prospective teachers as well as in-service teachers also. This will help teachers to know integrated technology with classroom teaching. This paper discussed about the role of ICT in 21st Century's teacher education.*

## **Introduction**

It is the age of information and technology (IT). Every aspect of life is related to science and technology. Huge flow of information is emerging in all fields throughout the world. Now information and technology is common in educational field for making teaching learning process successful and interesting. In 1998, UNESCO World Education report refers about student and teachers must have sufficient access to improve digital technology and the internet in their classroom, schools, teacher educational institutions. Teachers must have the knowledge and skills to use new digital tools to help all students achieve high academic standard. The quality of professional development of teacher education depends on the extent of ICT integration

in teacher education programme. According to UNESCO (2002) "ICT is a scientific, technological and engineering discipline and management technique used in handling information, its application and association with social, economic and cultural matters". Teachers are at the core of any living society. Technologies play an important role in training programme of teachers. Students accesses knowledge and information through TV, digital media, cable network, internet and social media i.e. Facebook, Twitter, Whatsapp, Linkedinn, Igo, Line, Wechat etc. ICT is very important for Preservice teacher education programme in the 21st Century. Without proper knowledge of ICT teacher cannot perform in his/her class room and it could not be said to be a complete one.

The scenario of the classroom is changing. There is a technological gap between the progress of the society and instructional activities of the teacher in the classroom. If we see in our society on the one hand technology has revolutionized our society and on the other hand the teaching learning activities at school level have remained so far away from technology. Students learn from multi sources and for this reason use of ICT & Multimedia are very much essential in educational field and simultaneously teacher's knowledge of ICT and Multimedia also required.

#### **Importance of ICT in Teacher Education?**

The classroom is now changing its look from the traditional one i. e. from one way to two way communications. Now teachers as well as students participate in classroom discussion. Now Education is based on child centric education. So the teacher should prepare to cope up with different technology for using them in the classroom for making teaching learning interested. For effective implementation of certain student centric methodologies such as project-based learning which puts the students in the role of active researches and technology becomes the appropriate tool. ICT has enabled better and swifter communication; presentation of ideas more effective and relevant way. It is an effective tool for information acquiring-thus students are encouraged to look for information from multiple sources and they are now more informed then before.

#### **Recent Trends in Teacher Education: -**

Needless to say teacher education has to include new technology. Teachers should also know the right attitudes and values, besides being proficient in skills related to teaching. As we know the minimum requirement of any training programme is that it should help the trainee to acquire the basic skills and competencies of a good teacher. Now-a-days new trends in teacher education are Inter-disciplinary Approach, Correspon-

dence courses, orientation courses etc. Simulated Teaching, Micro Teaching, Programmed Instruction, Team Teaching are also used in teacher education. Now-a-day Action Research also implemented in Teacher Education. ICT acts as the gateway to the world of information and helps teachers to be updated. It creates awareness of innovative trends in instructional methodologies, evaluation mechanism etc. for professional development. Different Strategies for applying ICT in Teacher Education:-

- i) Providing adequate infrastructure and technical support.
- ii) Applying ICT in all subjects.
- iii) Applying new Pre-service teacher Education curriculum.
- iv) By using application software, using multimedia, Internet e-mail, communities, understanding system software.

ICT helps teachers in both pre-service and in-Service teachers training. ICT helps teachers to interact with students. It helps them in preparation their teaching, provide feedback. ICT also helps teachers to access with institutions and Universities, NCERT, NAAC NCTE and UGC etc. It also helps in effective use of ICT software and hardware for teaching – learning process. It helps in improve Teaching skill, helps in innovative Teaching. It helps in effectiveness of classroom. It also helps in improving professional Development and Educational management as well as enhances Active Learning of teacher Trainees. ICT helps teachers in planning for teaching. In order to introduce ICT in pre-service teacher education different methods and strategies are applied. Different tools are used such as word processing, Database, Spreadsheet etc. ICT is used as an “assisting tool” for example while making assignments, communicating, collecting data & documentation, and conducting research. ICT is a medium for teaching and learning. It is a tool for teaching and

learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, in simulations and educational networks. ICT is a popular tool for organisation and management in Institutions. ICT plays an important role in student evaluation. ICT is store house of educational institution because all educational information can safely store through ICT. ICT helps Teacher to communicate properly with their students. So ICT bridge the gap between teacher and students. ICT helps Teacher to pass information to students within a very little time. ICT helps Teacher to design educational environment. ICT helps Teacher to identify creative child in educational institute. ICT helps Teacher to motivate students and growing interest in learning. ICT helps Teacher for organizational preconditions (vision, policy and culture). It is also helps Teacher for their personnel support (knowledge, attitude, skills). ICT helpful for technical preconditions (infrastructure). ICT helpful for designed learning situations which are needed for both vocational education and the

training of future teachers (in the teacher training institutes). Teacher training institutes can develop their curriculum using ICT. With the help of ICT Teacher training institutes can develop communication network. Teachers learn most from their own networks (learning from others) with the help of ICT.

#### **Conclusion:-**

Teaching occupies an honorable position in the society. ICT helps the teacher to update the new knowledge, skills to use the new digital tools and resources. By using and acquire the knowledge of ICT, student teacher will become effective teachers. ICT is one of the major factors for producing the rapid changes in our society. It can change the nature of education and roles of students and teacher in teaching learning process. Teachers in India now started using technology in the class room. Laptops, LCD projector, Desktop, EDUCOM, Smart classes, Memory sticks are becoming the common media for teacher education institutions. So we should use information & communication Technology in Teacher Education in 21st Century as because now teachers only can create a bright future for students.

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|----------------------------------|-------------------|--------------------|-------------------|
| <b>Article Received on</b>       | <b>08.10.2017</b> | <b>Reviewed on</b> | <b>18.10.2017</b> |
| <b>Observations reflected on</b> | <b>20.10.2017</b> | <b>Modified on</b> | <b>22.10.2017</b> |

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## Implementation of ICT @ School Scheme in Secondary Schools of Chhattisgarh

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**Key Words :** *ICT @ School Scheme, Secondary Schools of Chhattisgarh*

### **Abstract**

*The emergence of new global economy has serious implications for the nature and purpose of educational institutions. As the access to information continues to grow rapidly, schools cannot be contented with the limited knowledge to be transmitted in a fixed period of time. Today Information Communication Technology is being utilised in every part of life. In education use of ICT has become imperative to improve the efficiency and effectiveness at all levels of learners. Its influence has changed the daily life style of many people. ICT in education is the support material in the hands of the human recourse involved in the educational process in order to enhance the quality of education. In India, ICT@school scheme was launched in 2010 with the implementation of Rashtriya Madhyamik Shiksha Abhiyan (RMSA) with some special features. The objective of this scheme is to make ICT literate to the teachers as well as students. The purpose of this study was to investigate the school- related issues in the secondary schools of Chhattisgarh. More specifically the research focused on what extent ICT@Schools scheme attained its objective. The major findings of this study revealed that the objectives of ICT@schools scheme is succeeded into certain extent, but a lot need to be done for the successful of this scheme.*

### **Introduction**

In modern society Information and Communication Technology (ICT) plays a remarkable role in school education. ICT in schools provide lots of opportunities to teachers as well as students to transform their learning activity, teaching method from classical to modern and scientific method. ICTs have demonstrated potential to increase the option, access, participation, and achievement for all students. According to UNDP ICT is defined as a “ diverse set

of technological tools and resources used to communicate and to create, disseminate, store, and manage information.” ICT such as videos, television, and multimedia computer software that combine text, sound, and colourful image used by the students to not only make the learning easy and effective even it also provide the authentic content that make the learning more reliable and trustworthy. According to (UNESCO-2002) Information and Communication Technology (ICT)

refers to forms of technologies that are used to create, store, share and transmit information. The field of education has been affected by ICTs, which have undoubtedly affected teaching learning and research (Yousuf, 2005). ICTs have the potential to accelerate, enrich and deepen skills, to motivate and to engage students in different fields of learning. According to Daniel (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Many countries are now understanding the importance of ICT and mastering the basic skills and concepts of ICT as a part of the core education, alongside reading, writing and numeracy. India recognised the importance of ICT in education as early as 1984-1985 when the Computer Literacy and Studies in Schools (CLASS) was initially introduced as a centrally sponsored scheme during 8<sup>th</sup> plan. The scheme widened to provide financial grants to educational institutions and also cover new government aided secondary/senior secondary schools. The implementation partners were the State/UT government, State Institute of Educational Technology, Kendriya Vidyalaya Samiti, Government and Government aided school system. Under the CLASS components of the ICT scheme, the union government would provide the 75% financial assistance to states/UTs. The balance of 25% of funds would be contributed by the State government/UTs. But in the case of North east region the ratio is 90:10.

At first ICT in schools scheme was launched in Dec 2004 and revised or subsumed in 2010 through Rashtriya Madhyamik Shiksha Abhiyan (RMSA) to provide opportunities to secondary level students to mainly build their capacity on ICT skills and make them learn through computer aided learning process. This scheme has essentially four components – the first one is the partnership with State Government and Union Territories

administration for providing computer education to secondary and higher secondary Government and Government aided schools. The second is the establishment of smart schools. The third component is the teacher related interventions such as capacity enhancement of all teachers in ICT and scheme for national ICT award as a means of motivation. Fourth one is related to the development of a e-content. “ICT@Schools” scheme is a welcoming scheme and window of opportunity to the learners in the schools of India to bridge the digital divide. This scheme also takes its importance because with the use of ICT we can also empower the group of people who are socially deprived, the marginalized section of our society like schedule tribes and schedule caste people of India.

India is the country where largest numbers of tribal population is found. According to 2011 census, India consists of 8.6% tribal population. In India tribes are largely found in central part of India and Chhattisgarh is state which is a part of central India. The state gained statehood on November 1, 2000. It is 10<sup>th</sup> largest state of India by area which has geographical area of 135,195 sq km. The rate of development in the field of education is still slow and state has committed to spread the knowledge of freedom of thoughts its citizens which is reflected in its policy. The overall literacy rate as per the census 2011 is 64.70%.

In Chhattisgarh ICT@school scheme was launched in 2010 with the implementation of RMSA (Rashtriya Madhyamik Shiksha Abhiyan) with some special features. The objective of this scheme is to make ICT literate to the teachers as well as student with some special provisions.

This is a common feeling that now a days ICT is an important tool in all aspects of human life. Therefore the whole education system should be

reformed and ICT needs to be integrated in the educational activities. The influence of ICT especially internet cannot be ignored by the students as well as teachers in the process of teaching and learning. In a rapidly changing world, there is an urgent need to transform their learning from manual source work to an online source of work (Meenakshi, 2013). The basic Knowledge of ICT education is essentially for an every individual on the basis of which he/she will be able to access required information. The inculcation of ICT in education makes the teaching learning process more enjoyable and fruitful in all aspects.

ICT in education is an unavoidable policy that can not be not ignored by school authorities and teachers. School is a kind of platform through which we can easily transform the knowledge of ICT into the children through various mode of learning. The committee of advisor on science and the panel of Educational Technology (1997) suggested that teachers need to teach the content with educational technology. But when we look into the field of education there seems to have been on uncanny lack of influence and far less changes than other field such as medicine, business, law, banking, engineering, architecture etc. The implementation of ICT in education has not been a priority trend of educational reform and the state paid little attention to it. In this paper an attempt has been made to study the status of ICT scheme in Chhattisgarh state. This paper highlights the status of ICT@Schools Scheme in the ten Secondary Schools in the Bilaspur district of Chhattisgarh.

### Research Questions

After studying the related reviews on the use of ICT, the following research questions were emerged

1. What are the available infrastructures in secondary schools of Chhattisgarh?
2. Whether the teachers are aware about the importance of ICT?

3. Whether the students are aware about the importance of ICT?
4. How far the guideline objectives of ICT@schools scheme have been achieved/attained in secondary schools of Chhattisgarh?

### Objectives of the study

1. To study the available ICT infrastructure in the secondary schools of Chhattisgarh.
2. To study the ICT awareness of secondary school's teachers of Chhattisgarh.
3. To study the ICT awareness of secondary school's students of Chhattisgarh.
4. To study the implemented ICT@schools scheme in the secondary schools of Chhattisgarh.

### Procedure employed

In order to carry out the study descriptive survey method was adopted. As per the record, ICT@Schools scheme are operated in 130 Secondary/Higher secondary schools of Bilaspur district Chhattisgarh. To draw the sample at first phase 10 schools, where ICT@schools are operated, were selected through convenience sampling technique.

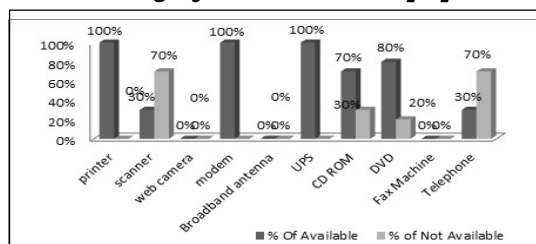
Tools of Data Collection: (i) Checklist (ii) Teacher Awareness Test (TAT), Student Awareness Test (SAT) and School Information Schedule were used for data collection.

**Table-1:**

### Availability of ICT Related Equipment

| Item              | (%) A | (%) NA |
|-------------------|-------|--------|
| Printer           | 100%  | 0%     |
| Scanner           | 30%   | 70%    |
| Web camera        | 0%    | 0%     |
| Modem             | 100%  | 0%     |
| Broadband Antenna | 0%    | 0%     |
| UPS               | 100%  | 0%     |
| CD ROM            | 70%   | 30%    |
| DVD               | 80%   | 20%    |
| Fax machine       | 0%    | 0%     |
| Telephone         | 30%   | 70%    |

**Graph 1:**  
**Availability of ICT Related Equipments**



It is evident from the Table 1 that mostly the web camera, Broadband antenna and fax machine were not available in any schools. In addition to this, Scanner and telephone were found only in 30 per cent of schools. So there is a need to fulfil the ICT requirements in all the schools for successful implementation of the scheme.

### ICT Awareness of Secondary School's Teachers

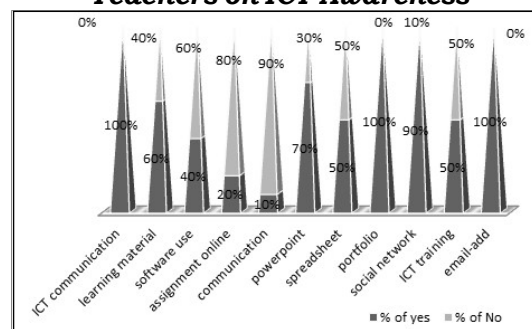
**Table 2:**  
**Responses of Secondary School Teachers**

| Item   | Yes  | No  |
|--|------|-----|
| ICT for communication                          | 100% | 0   |
| Collect the learning material for teaching     | 60%  | 40% |
| Use the educational software                   | 40%  | 60% |
| Give the online assignment                     | 20%  | 80% |
| Online communicate with student/teachers       | 10%  | 90% |
| Give the power point presentation for teaching | 70%  | 30% |
| Use the spreadsheet                            | 50%  | 50% |
| Make the portfolio record of students          | 100% | 0%  |
| Using social networking sites                  | 90%  | 10% |
| Receive the ICT training                       | 50%  | 50% |
| Having e-mail address                          | 100% | 0%  |

Table 2 describes the ICT awareness of secondary school teachers. About 40 per cent teachers said that they use

educational software and 20 per cent expressed they give online assignment to the students. Only 10 per cent teachers make online communication with students. 60 per cent teachers said that they take the help of ICT for collecting learning materials for teaching. 70 per cent teachers expressed that they use power point presentation for making teaching-learning effective. Table indicates that all most all teachers prepare portfolio record of students. It is also found that 90 per cent teachers use social networking sites. After the analysis of data we can say that teachers are not fully aware about the use of ICT in their teaching learning process. On the other hand state govt. school teachers of Chhattisgarh have receiving the ICT training time to time. But in spite of receiving the training still they are not competent and not make the use of ICT in their daily teaching learning process.

**Graph 2:**  
**Responses of Secondary School Teachers on ICT Awareness**



### ICT Awareness of Secondary School's Students

After the item wise analysis of data it was found that the students' awareness towards ICT is not so good. They are still far behind from the knowledge of computer in their teaching learning process. In most of the cases it is found that students do not want to take any interest in the field of ICT. Because they do not have a such kind of situations where they receive the knowledge of

computer. The student belongs to poor family background where the use of ICT in their home is not possible. It was found that they do not have much idea about the importance of ICT.

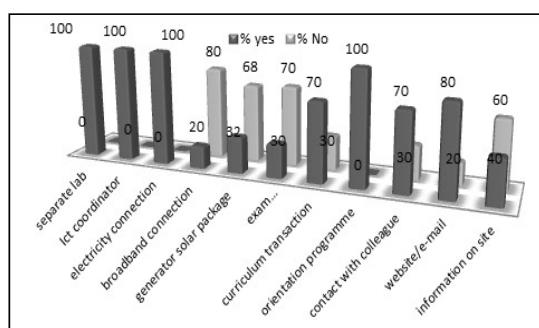
**Table 4:**

**Other Aspects of ICT@ School Scheme**

| Item                        | Yes(%) | No(%) |
|-----------------------------|--------|-------|
| Separate lab                | 100    | 0     |
| ICT Co-ordinator            | 100    | 0     |
| Electricity connection      | 100    | 0     |
| Broadband connection        | 20     | 80    |
| Generator solar package     | 32     | 68    |
| Exam question/mark sheet    | 30     | 70    |
| Curriculum transaction      | 70     | 30    |
| Orientation programme       | 100    | 0     |
| Contact with colleague      | 70     | 30    |
| Website/email               | 80     | 20    |
| Provide information in site | 40     | 60    |

**Graph 4:**

**Other Aspects of ICT@ School Scheme**



After the analysis of data, it is found that in 80 per cent cases, guidelines objectives of ICT@School Scheme has been fulfilled. The scheme mainly came into force after the RMSA implementation. The main objective of ICT@ School scheme is to literate the teachers as well as the students with the knowledge of computers and to make the teaching- learning process more easy and effective.

**Educational Implications**

Information and Communication Technology (ICT) is a universally

acknowledged as an important catalyst for social transformation and national progress. The 'ICT in schools' scheme is a window opportunity to the learners in the schools of India to bridge this digital divide.

- 1 The need of ICT education as a parallel stream of education instead of running it in the institution as an elective subject.
- 2 Up to certain specified number of years of schooling from the age of 5 to 15 yrs, large number of the students chooses the technical education. Therefore the inculcation of ICT in education is very much required in the present context.
- 3 There is a need to incorporate the ICT based education in the elementary level. Because at the +2 stage all such vocational/ technical education very much required to decide the future career perspective.
- 4 ICT based education also enable students to acquire skills needed for the digital world for higher studies and gainful employments.
- 5 The curriculum for technical education at all levels is also covers the basic subjects (science, arts, and humanities) to some extent. So that it would be possible to establish parity between general education titles as well as the technical and skilful education titles.
- 6 ICT education also helps to promote critical thinking and analytical skills by developing self-learning. This shall transform the classroom environment from the teacher centric to student centric.

**Conclusion**

ICT @ school scheme is one of the important schemes incited by the Govt. of India to make the learner skilful, promote the social justice at all levels and also provide the quality education with the use of ICT. The specific objective of the ICT@ school scheme is to make literate the teachers as well as students with the knowledge of computer in the teaching learning process. In some of

extent it is succeeded to achieve its objective There is a urgent need to change the attitude of teachers' towards the use of ICT in their teaching learning process, because some of the major findings of these research revealed that teachers do not want to use the ICT for their teaching purpose. The reason behind may be due to lack of interest, inadequate training, lack of efforts or practice, age gap and some kind of rigidity, and also habituated for the manual work etc. It is felt that unless and until , students and the teachers will not develop interest, the successful of programme will be a distant dream .

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|---------------------------|------------|-------------|------------|
| Article Received on       | 18.10.2017 | Reviewed on | 22.10.2017 |
| Observations reflected on | 26.10.2017 | Modified on | 31.10.2017 |

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# **Open Educational Resources in Quality Education: The Role of Teachers**

***Monalisa Dash \* & Priyaranjan Dash \*\****

**Key Words : Open Educational Resources, Quality Education**

## **Abstract**

*Access and quality related issues are globally used words in education irrespective of the level of education is concerned. When we talk about India, access to quality education is a pressing need of Education System. But it is not easy to address both the issue with proficiency. The most serious constraint is related with the availability of resources. According to National Knowledge Commission (NKC), the increase in amount and usage of the Open Educational Resources (OERs) can serve as the panacea of this problem. As teacher is central to any educational system, it is thereby pertinent for her to incorporate solutions for quality education. In order to better understand the integration of OERs in teaching learning process, we need to have a clear picture about it. In this context the present study provides detail understanding about the meaning of OERs. It entails a brief history of OER. It also helps the readers to explore the various benefits of using OERs. It enlightens about the different strategies to be employed by the teachers in order to find OERs. This study also lists out the general and specific knowledge and skills required to develop and use OERs. Lastly the challenges of using OERs are enumerated. The article ends by offering few suggestions that may prove fruitful in tackling those challenges.*

## **Introduction**

Access to quality education has been a serious issue in India till date. The contributing factors can be the paucity of high quality teachers and poor quality of educational resources in both private and government schools. This issue is further aggravated by outdated facilities, outmoded teaching methods, overcrowded classrooms and declining research standards (CARRHE, 2009; Kanwar, Balasubramanian, & Umar, 2010; Lall, 2005; Stella, 2002). To address the aforementioned problems India's National Knowledge Commission (NKC), which was

appointed in 2005 with the intent of enhancing standards of the Indian education system, recommended to substantially increase the amount and usage of Open Educational Resources (OERs) and Open Access (OA). Because NKC believed that the widespread availability of high quality educational resources is the panacea of the pressing problems.

## **Understanding OERs**

There is no standard definition of Open Educational Resources. The definition of OERs promoted by UNESCO states that "Open Educational Resources



(OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them. OERs range from textbooks to curricula, syllabus, lecture notes, assignments, tests, projects, audio, video and animation.”

A more widely used definition of OER from the *William and Flora Hewlett Foundation* states: “OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.”

The ‘educational resources’ in OER implies the stock or supply of materials used in education in order to function effectively. Here the adjective ‘open’ implies that the educational resources created by someone can be used free of cost by anyone. To understand the adjective ‘open’ better, we need to know a little bit about how a copyright works. Whenever we create something like a photograph, a song, a drawing, a film or a story we automatically own a copyright ‘all rights reserved’. But sometimes specially in digital world we don’t want all the rights. We may want our blog spot to be shared online and may be redistributed. In such a case the copyright is a blunt tool. This is why ‘Creative Commons’(CC) were invented in early 2000, because it was important for the digital era to have modular tools which allowed authors to permit uses of their creative works. There are many different clauses in Creative Commons like BY is “attribution”, NC is “non-commercial”, ND is “non-derivative” and SA is “share-alike”. The combination of one or more of these clauses give rise to six CC

licences that changes the status from ‘all rights reserved’ to “some rights reserved”. For example, CC-BY-SA is the licence of Wikipedia. Thus thousands of Wikipedia users can rewrite, edit, modify and improve the original article in it.

To access the extent to which an educational resource is open, the four R’s framework suggests (*Wiley 2009*):

**Reuse**—The most basic level of openness.

People are allowed to use all or part of the work for their own purposes (e.g. download an educational video to watch at a later time).

**Revise**—People can adapt, modify, translate, or change the form the work (e.g. take a book written in English and turn it into a Spanish audio book).

**Remix**—People can take two or more existing resources and combine them to create a new resource (e.g. take audio lectures from one course and combine them with slides from another course to create a new derivative work).

**Redistribute**—People can share the work with others (e.g. email a digital article to a colleague).

### Historical Background

The history of OERs can be traced from 1994, when *Wayne Hodgins* coined the term “learning objects” that led to the popularization of the idea that digital materials can be designed and produced in such a manner as to be reused easily in a variety of pedagogical situations. In 1998 *David Wiley* coined the term “open content” that popularized the idea that the principles of the open source can be productively applied to the content. In 2001, *Larry Lessig* and others founded the Creative Commons and released a flexible set of licenses that were both a vast improvement on the Open Publication License’s structure and were significantly stronger legal documents. In 2001, MIT announced Open Course Ware initiative to publish nearly every university course for free public access for non-commercial use. And finally the term “open educational resources” was coined at

UNESCO's 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries.

### **Use of OERs by teachers**

Teachers play an instrumental role in ensuring the quality of teaching and learning delivered to students. With the creation and usage of OERs they may be able to resolve some of the challenges to quality education such as:

**1. Time constraints :** It takes a huge amount of time for teachers to prepare curriculum. Again lots of hours need to be spent by them in selecting, developing or adapting teaching and learning materials and assessment tools to achieve the objectives of the set curriculum. Here OERs can rescue by just adapting it to fulfil contextual needs.

**2. Cost effectiveness:** Expensive text books, reference books, notes can all be replaced by OERs cost effectively as we just need to reuse these educational materials free of cost.

**3. Access to high quality teaching and learning materials:** Many of the OERs are prepared by highly reputed institutions like MIT, Khan Academy, IIT and so its quality cannot be denied.

**4. Diverse needs of their learners:** Learners in the classrooms exhibit diverse learning styles. OERs can address their needs and demonstrate gender sensitivity.

**5. Paradigm shift in teaching and learning environments:** OERs aids in transformation of a classroom environment from teacher-centred to learner-centred approaches. For example it increase the interactivity in the classroom that may inturn foster engagement and bring success.

**6. Online access opportunities:** More and more use of OERs increases student access to online materials and collaborative networks. This also leads to opportunities in online publishing.

**7. Legal requirements to access:** Open access to educational materials needs

legal requirements like Creative commons license. This makes the access free of cost and therefore broadens it.

**8. Accommodate growing knowledge base:** In this knowledge society, knowledge is advancing at a rapid fire rate. OERs can resolve it by creating and reusing it.

**9. Update their ICT skills:** Teachers can benefit substantially by gaining technical expertise.

**10. High student expectations:** Students nowadays exhibit a greater expectation from themselves like a very high percentage, may be above 90, a lucrative job, a lavish lifestyle. All these require huge exposure to educational resources that OERs can fulfil

**11. Ever-increasing class size:** Using Open educational resources can prove fruitful in solving this enormous problem. Teachers may not get sufficient time in the classroom to reach every student. So in that case OERs can be referred by teachers for additional support.

**12. Accommodate disabilities:** Sometimes some pupils need extra help. This can be well served by OERs.

### **Where to find OERs?**

The widespread availability of educational resources world-wide has led to the challenges of finding out the appropriate OER from a Special OER search engine, an OER repository or OER directory sites.

To overcome this we can employ some strategies as follows:

**1. General Search:** Google (Google Advanced Search-usage rights-free to use, share or modify), CC search

**2. Image search:** CC search, Wikimedia commons, Flickr, Google images (Google Advanced Search-usage rights-free to use, share or modify), Pixabay, Open Clip Art Library, Fotopedia (Advanced options-open license), The Noun Project, Encyclopedia of Life, Public Library of Science (PLOS), Europeana

**3. Video search:** YouTube(<http://www.youtube.com/creativecommons>), Video, Internet Archive, Ted- Ideas worth spreading, Al Jazeera

**4. Audio/Music search:** Jamendo, ccMixter, Internet Archive, Free Music Archive, SoundCloud

**5. General Education search:** OER Commons, The Orange Grove Digital Repository

**6. Recorded Lectures and Video Tutorials search:** Open Yale Courses, MIT(MIT YouTube channel), UC Berkeley(webcast.berkeley), KhanAcademy

**7. Open Textbook search:** College Open Textbooks, Open Stax College, Siyavula, CK-12, Boundless

**8. Simulation and Animation search:** PhET

**9. Modular Course Components:** Connexions, Curriki, Merlot, Wikieducator, Wikiversity, Jorum

#### **Knowledge and Skills required for effective use of OER**

In order to use OER effectively a teacher needs to develop some skills. At first he needs to have knowledge about copyrights and licensing. This would help him to locate and identify the open educational resources that fits to his needs. A teacher should have expertise in design and development of course and course materials. For the same purpose he needs skills to first identify the target audiences, then define learning outcomes. He also needs to be skilful in selecting the appropriate teaching and learning strategies and developing materials. Technical expertise is inevitably essential for the use of OERs by the teachers as it is this skill that helps him to create, adapt and use the multimedia materials. Apart from these expertise he should also possess fabulous communication skills and research skills so as to share information about OERs.

#### **Challenges of using OERs**

Although there is plethora of benefits in using OERs, it has got few challenges.

#### **Technical challenges**

Lack of broadband facilities in remote places may hinder the use of OER. Even the interoperability issues may become a challenge for the same.

#### **Social challenges**

Teachers may have lack of technical skills. Some may also be unwilling to use OERs, thinking that it must be very difficult to acquire technical expertise in it. Quite a many may also think that since its their creation they should thereby enjoy all the rights and may be unwilling to share it. It may be difficult to determine the quality and relevance of appropriate OER. They may also feel that it's a waste to spend loads of time for adapting, adopting and authoring OERs. But here the greatest challenge is the lack of public understanding on OER.

#### **Economic challenges**

Teachers may sometimes have issues with either infrastructure cost or OER development cost. The creation of OERs may require numerous tools varying from a smart phone to laptop. All the teachers may not avail proper facilities to create OER due to poor economic conditions. Even maintenance of OER that is updating it everytime may prove expensive.

#### **Legal challenges**

Teachers may also lack copyright awareness. Difference between 'all rights reserved' and 'some rights reserved' may not be known to many. Moreover the different clauses in CC and six different licences in it may puzzle them.

#### **Conclusion**

OERs are the educational materials that can be reused and distributed without any hassle of legal permission from author and that too free of cost. As discussed above OERs offer a plethora of benefits. Still the challenges posed are numerous. Some of the possible solutions to overcome these challenges can be like we may use various evaluation tools available to judge the quality of OERs. The Creative Commons website can be

referred for legal challenges as it does a great job in explaining the various types of licensing. Resources are easy to be updated by the OER providers. Thus OERs do offer a panacea for the prevalent problems in education system specially related to teaching learning process with limited hassles. We need to use it judiciously so as to fulfil our requirements without compromising with quality.

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| Article Received on       | 08.10.2017 | Reviewed on | 18.10.2017 |
| Observations reflected on | 20.10.2017 | Modified on | 22.10.2017 |

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## Improving Quality of Elementary Education through MOOC: A Hands on Experience

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**Key Words : MOOC, Pre-service Teachers, TBCL, TCCL**

### Abstract

*TESS-India's (Teacher Education Through School Based Support) MOOC is a discernible on line Course in Odisha with collaborative patronage of SCERT aims at improving the quality of Elementary education. Primarily it focuses on teaching competencies of pre-service teachers, In-service teachers so as to refurbish the existing pedagogical practices and to bring a remarkable change in teaching-learning process. In this connection, the paper highlights the credibility of MOOC for enriching pre-service teachers with pitiable teaching skills, competencies and escalating pedagogical content knowledge to make elementary education more student-centric & live worthy. This paper portrays some data on pedagogical developments of pre-service teachers through a small scale qualitative investigation over a period of one & half months internship programme by using innovative tools and techniques such as TCCL (Teaching competency check List) and TBCL (Teaching Behavior Check List) which reveal an in-depth nexus between open online courses and gross manifestation of inherent professional qualities in teachers. This paper intends to shed light on the efficiency of TESS-India MOOC towards the improvement of pedagogical skills & attitude in teachers to save dignity, modesty & majesty of elementary education from the brink of extinction.*

### **Introduction**

In this digital era “knowledge evolution” has a great impact on our education system. If we dissect, mutilate the concept, framework and roadmap meticulously, perhaps we will have a handful experiences regarding the visible and viable relationship between different aspects of knowledge networking, knowledge construction, knowledge flowing and knowledge extension. In 21<sup>st</sup> century so far knowledge is concerned, it seems to be very confusing, cryptic and dubious because of rapid change in social structure and architecture gives an

impetus and provides driving force for reshuffling the human cognition. Over the decades, it has been thought ‘learning occurs inside the four walls the class room’ but now as a concocted statement, it is being outdated because the locus of learning is in the society rather in class room and obviously it declines the interest of students towards schools. Either our school environment is not so sensitive to fascinate and mesmerize student’s needs and enthusiasm or our teachers are not often potent to create a real learning context inside classroom which contributes a

sporadic progression of knowledge construction in the present time. In this dynamic world when knowledge is not static the trend of knowledge construction is being revamped. It paves creative ways for paradigm shift from source to resource, from text to touch, from word to world, from explain to experience and from knowledge to wisdom. So MOOC (Massive Open Online Course) avails platform, leaves a benchmark for sharing, interaction, communication and transaction each other ideas, perception & experiences which inject a sense of competitiveness, transparency, skillfulness & competency in individual.

Amid talk of an interconnected world, Inclusive democracy, contemporary education has been engulfed within the territorial geography of conflict & contradiction which are raising their heads with an intention to revising, reorganizing & restructuring existing curricular practices to make 21<sup>st</sup> century education more practical & live worthy. At the same time a fresh & devastating battle comes to light which orchestrates forbidden threats on the legacy & compassion of quality education which is a fundamental right for all as enshrined in our constitution. Man vs. machine, knowledge vs. Wisdom, Global vs. local, Inclusion vs. exclusion, Equity vs. equality & Mechanistic vs. humanistic approach are such burning competition in today education which transform the entire ecosystem in danger & so far its progression and proliferation are concerned it have come to a kind of standstill & take a back seat. In this stumbling & beleaguered situation, searching conflict- resolution mechanism to resilience the fractured educational disorderness surface enormous questions in the mind of educationist, policy maker & administrators. Pointing to India's thriving multicultural & diverse democracy, tantalizing debate, arguments & public discourse have not

yet come out with such answer which would be a panacea for haywire education system. Having realized this problem, the need of Teacher education has been felt as we all know Teachers are the greatest assets of any education system who stand in the interface of transmission of knowledge, skill and value. As a demanding issue, Innovation & reformation in Teacher education need to be addressed prudently that go into preparation of skilled & competent teachers who confront today's diverse, complex & global societies. There are many initiatives currently in progress and integration of OER with Teacher education is a noble one. It has been gaining wider acceptability among the educational community. Having realized its potential for improving the standard of Teacher education & educational practice, it is high on national agenda of many countries and India is not an exception

### **OER & Quality Education: Indian Context**

OER avails platform, & provides tremendous scope for sharing, interaction, communication and transaction each other ideas, perception, experiences which inject a sense of competitiveness, transparency, skillfulness, competency in individual. For Teacher Education, as a handy asset, as cynosure of knowledge pool, OER forms Professional Bridge between student-teachers, teacher educators and renowned educationist for enlarging the boarder of their knowledge sphere and simultaneously showcase their latent potential. A visible nexus between Open online course & professional development has been confirmed by research results & so far Teacher education is concerned, it is being widely accepted that OER has some profound effect on reformation and innovation of Teacher education and subsequently provides fuels for attaining quality at Elementary level.

### **About TESS-India OER**

TESS-India (Teacher Education Through School Based Support in India) OER is a popularly circulated OER in odisha with collaborative patronage of SCERT aims at improving the quality of education at primary and secondary level. Primarily it focuses on teaching competencies of teachers, teacher educators lead to refurbish, reshuffle the existing pedagogical practices for bringing a drastic change in teaching –learning process. So far its workability, usability and productivity are concerned; it seems to be very promising and effective for student –teachers in all teacher- training institutions. TESS-India OER has been designed in taking account of local context so as to escalate, foster hand on experiences. Due to digitalization, DIETs are treated as a suitable place for meaningful use of OER and also extension services for deprived one.

### **Roles of OER in Quality Improvement of Teachers**

Smart India, Clean India, Green India & Digital India are such enchanting key words at present which can endeavor, which bring new hope to make dreams into reality but the ingredients, the support services are not up to the mark, are not so vibrant ,are not often satisfactory put whole effort at bay. Support services encompass structural and functional part but due to lack of intuition, experiences, knowledge, we are not able to integrate, not able to overlap, not able to fuse the above services which are treated as hurdles, as constraints for looking the success at near. In recent era knowledge are in the hand of every one due to digitalization and globalization and it can be sharpen, can be enriched, can be enlighten, can be boosted, can be surged through constructive interaction, meaningful transaction & fruitful communication of each other inner ideas, innate perception, inborn philosophy and acquired experiences may be a harbinger of knowledge networking, a quantum of knowledge. So OER is operated as a light

house for those which information ship is capsized in the ocean of confusion and contradiction.

At now, the definition, the designation, the destination and the ambition of education may be felt differently at different context. Some believes good, amicable and conducive physical facilities may able to ingrain a real sense of education and others focus on suitable, viable and reliable manpower which surface our ignorance, express our ill quality, outshine our in competencies which is a matter of great concern to reach at the peak of success. OER is a complete package, combo offers, a powered drink which resurrect our soldiers to accomplish their duties and responsibility for making our society wise and creative. So far the TESS-India OER is concerned it is so productive and energetic not only for the teachers but for the students, students-teachers, teacher educators and other stake holders who play a powerful rule for inspiring, better functioning and synchronizing education system for quality improvement at different level. The hidden beauty and priority of this OER is that it has been designed on the basis of experiment of different educational theories and principles and also stands on the framework, backbone of educational psychology and social psychology etc. The architecture of this OER is very simple and user friendly for which it has been accepted as an epicenter of knowledge web and information database.

In our education system, there are different layers such as plan and policy, teacher education and school education. So in this connection teacher education has a vital effect on the quality of school education due to the invisible nexus between different layers of education eco system and also treated as a stepping stone for realizing the underling ethos of education. So it is the utmost concern at present to revamp, to re organize, to

reshuffle the existing teacher education system with a measure objective to equip our teacher educator with desired and diverse knowledge and experiences which invoke, incite them to install real social context in the training classes. The TESS-India OER has been prescribed as a placebo not for acquiring knowledge but for constructing and developing knowledge and skill. So this OER leaves hall mark, gives foot print in improving the quality, dignity, modesty and flexibility of pre service teachers in most of the training institution which fuel for engulfing the fragrance of quality education at school level in extension mode. It supports teachers with magnificent, master class and majestic skill which not only make them legendry and iconic but also induce for struggling in the era of knowledge evolution. The peculiarity of this OER is that it is easily accessed and assessed and simultaneously provides positive feedback to user which enhanced their accountability and credibility.

#### **Demands for MOOC in preparing 21st century Teachers**

Time to time TESS-India prescribes a course known as MOOC (Massive Open Online Course) for teacher educators, student-teachers, school-teachers, BRCCs, CRCCs which engages them in communicating& intimating their ideas, experiences, acquired knowledge with each other and also purifies and scan

their junk knowledge like the master cleaner of smart phone and also reinvigores them with new and update knowledge and information regarding educational practices and experiment. The important aspects of this MOOC is that it maintains and sustains individuality , sustainability and reflectivity of each user and opens platform for reviews other ideas, reorganize, recycle, reuse their own knowledge for the betterment of schema and also point out ways for reducing knowledge confusion.

By the collaborative patronage of SCERT, TESS-India MOOC has been left its landmark on different focused district of Odisha. The main agenda of this organization was to empower primary school teachers with suitable and reliable skills and competencies and DIETs are regarded as a middle man, negotiator, arbitrator for executing and functionalizing. So looking to the importance of primary education, TESS-India organizes various workshops, training, and orientation program for school teachers and DIET's faculty for administering pitiable teaching attitudes in their blood and makes them acquire update knowledge to refurbish their existing classroom practices in all DIETs and schools in Odisha.

DIETs are running by the supportive hands of MHRD and SCERT with a major intention to foster the quality of teacher

**Table-1:**  
**Teaching Competency of Trainees in Maths & Science Classes**

| Name of the Cluster | student- teachers<br>in science classes |    | student- teachers<br>in math classes |    |
|---------------------|---|----|--------------------------------------|----|
|                     | No                                      | %  | No                                   | %  |
| TPF                 | 20                                      | 10 | 20                                   | 10 |
| GITCrD              | 20                                      | 10 | 40                                   | 20 |
| GITCrPD             | 25                                      | 13 | 35                                   | 18 |
| GITCrPFD            | 55                                      | 27 | 45                                   | 22 |
| GITCrPFRcDtD        | 80                                      | 40 | 60                                   | 30 |



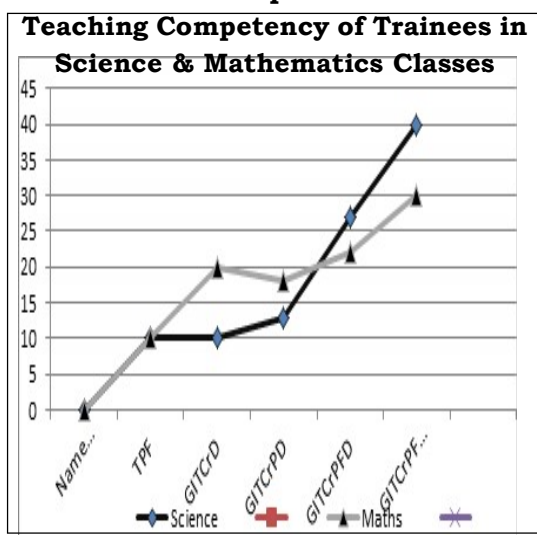
education because we know the destination of a country is made inside the classroom and teachers are regarded as a designer and DIETs are treated as a teacher producing factory and teacher educators are the engineer. Lots of money has been allocated, distributed and transacted but all the precious efforts have been encapsulated inside the triangle of confusion due to the qualification and working strategy of teachers. DIETs fail to create a real & practical learning environment which poses threat on quality production of pupil teachers. Due to lack of appropriate knowledge teacher educators are facing problems for creating teaching interest and attitude in the mind of pupil teachers. They are using such method of teaching which devoid of real experiences and unable to depend on the recent methods of knowledge construction and expansion such as connectivism. So TESS-India has been taking initiatives for enriching teaching skills of pupil teachers through availing & integrating OER in all DIETs.

#### **Ex-Post Survey for Measuring Effectiveness of TESS-India's MOOC**

This paragraph specially deals with some data which have been collected over a

period of one & half month internship programme from 200 pre-service teachers through a small scale qualitative investigation with the help of innovative tools and techniques such as TCCL (Teaching Competency Check List) and TBCL (Teacher Behavior Check List). Researcher collected data regarding any significance changes in teaching attitude and competency of student teachers after getting training and orientation by TESS-India. The TCCL and TBCL contain various items under different dimension of teaching competency. First the researcher identified some key points of classroom practices and then arranged them into various clusters for data analysis and interpretation. Key activities like **group work / group discussion(G), instant questioning (I), thinking (T), constructive argument(Cr), presentation(P), dialogue(D), feedback(F), reflective practices(R) & contextual teaching(Ct)** were noted down with above code names. By using permutation and combination technique those were made into different clusters such as GITPFD, DTPFR, GITCrPF, GITCrFRD, and GITCrPFRCD. The data were collected from 1<sup>st</sup> year & 2<sup>nd</sup> year D.El.Ed classes having approximately 200 student teachers by observing their classroom practices and reflected on the post OER effect. Classroom transaction of different student teachers were observed with the help of TCCL and TBCL containing different items of teaching competency and attitude and complied under different dimension. This tool was used in different classes such as science and math classes. Then the data were analyzed qualitatively and expressed with the help of percentage (%). Due to complexity, the percentages of the data for different clusters were arranged in descending order from simple to complex. Student teachers whose classes were noticed with complex cluster was said to

**Graph 1**



be good compare to others who were using simple cluster.

### **Results & Discussions**

So the above table indicates the precious effect of TESS-India MOOC in improving teaching competencies and skills which treated as a big success for teacher education and ultimately it provides a driving force for producing good teachers and also enhances teacher's compatibility and accountability but it is cleared that some sorts of differences has been noticed between mathematics classes & science classes regarding the attainment of different clusters. Perhaps factors are responsible but more intensive researches need to be undertaken to make a conclusion on this issue.

### **Educational Implication**

On the basis of main findings of the study, It is clear that there is a need to take prudent measures to intensify proper implementation of OER in Teacher Education & School Education. The following Suggestions may be given for improving the Quality of Elementary Education in Odisha.

1. Integration of OER with Diploma In Elementary Education (D.El.Ed) Course strengthens Teacher Training Programme.

2. OER works as a roadmap for Continuous Professional Development (CPD) for Teachers.

3. It can be regarded as a support services for School Education System.

4. Finding can be taken as a national policy guideline for refurbishing existing Education Policy & plan

### **Conclusion**

After independence, school education always trap priority in every education committee and commission and teacher education is being ignored due to the conservative mindset of higher authorities. A lot of researches have been undertaken in school level but teacher education is the worst sufferer. So many research papers and articles are available on teaching methods at school level but rarely do we find any article regarding transaction strategy in training classes. With a view to provide access to the best quality learning resources across country, MOOC provides an integrated platform & portal. However the extent of OER use, reuse and adaption is still in its primitive stage in many DIETs. Creating a support system which facilitates the use & management of OER necessities a strong national policy guidelines leads to fulfill our long expected dream.

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| Article Received on       | 08.10.2017 | Reviewed on | 18.10.2017 |
| Observations reflected on | 20.10.2017 | Modified on | 22.10.2017 |

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## Use of Geogebra Software for Enhancing Students' Achievement in Geometry

**Lal Kumar Singh \***

**Key Words : Educational software, Geogebra, Geometry Achievement**

### **Abstract**

*The rapid growth of technology for teaching and learning includes the introduction of educational software. However, a few reports were found that provides evidence on the effectiveness of these software. The purpose of this study is to determine the effect of using dynamic mathematics software Geogebra in geometry teaching on geometry achievement of students. This study involved students from a CBSE affiliated English medium school of Bilaspur (C.G.). The quasi-experimental study with equivalent group post-test only design was conducted to examine the effect. A total of 23 students were employed in the experimental group and 22 students in control group. The experimental group was subjected to the group taught by using Geogebra software while control group taught by traditional teaching method. The data collected after 3 weeks of application and analyzed by employing Mann-Whitney U test. The finding of the study showed significant difference between experimental and control group's achievement in geometry. The difference is in favor of experimental group which had taught by using Geogebra. The finding present implications in the field of education that promote the use of Geogebra as a means of improving geometry teaching at secondary level.*

### **Introduction**

Education is a systematic process through which a man acquires knowledge, experience, skill, and sound attitude. It makes an individual civilized, refined, cultured and educated. According to *MK Gandhi*, "By education I mean an all-round drawing out of the best in child and man- 'body, mind and spirit'." In this context education is certainly a means of all-round development of man. The formal system of secondary education has mainly three components i.e. teacher, students and curriculum. The curriculum of secondary education exists mainly five

subjects i.e. language, social science, science and mathematics. Mathematics has an important place in school education at secondary level. It is the numerical and computation part of men's life and knowledge. It helps people to give exact interpretations to their various ideas and conclusions. According to Webster dictionary, The science of numbers and their operations, interrelations, combinations, generalizations and abstractions and of space configurations is called mathematics".

*Kothari Commission* (1964-66) suggested that every student should study

mathematics compulsory up to class X level (as cited in Kulshrestha, 2014). So, the knowledge of mathematics is helpful in day- today life. At this level mathematics divided into various branches such as algebra, trigonometry, geometry, statistics, set theory and calculus etc. Geometry has an important place in mathematics curriculum of secondary education. According to Webster dictionary – “Geometry is a branch of mathematics that deals with points, lines, angles, surfaces and solids”. Geometry is visual and dynamic in nature. Therefore, it requires visualizing abilities in teaching-learning process.

It is important for students learning geometry, to be able to imagine, construct and understand construction of shape in order to connect them with related facts. It can relevant that the use of information and communication technology (ICT) to visualize the teaching learning process. The success of using ICT in teaching-learning is depending on the use of appropriate technology tools. A number of mathematics teaching learning tools are available such as: interactive white board, mathematics calculator, geometers, sketchpad and Geogebra etc. among these one of the interactive and dynamic mathematic software for teaching learning geometry is Geogebra. By using Geogebra construction can be made with points, vectors, segments, lines, polygons, conic-sections, inequalities, implicit polygons and functions. All of them can be changed dynamically afterwards. Elements a can be entered and modified directly via a mouse and touch through impact bar. So the software concurrently gives the algebraic, graphic and spreadsheet representation of mathematical objects. Any changes made to one of these aspects are directly related to others.

Students at secondary level perceive the study of geometry a challenging one. They have also psychological tendency that this subject is very difficult to study

due to the nature of the subject. They have fear of being failed in this subject. On the one hand this subject is interesting for some students, where as many students face difficulties in solving the problem. Here the question arises that “how this subject can be made interesting to the majority of students”.

There are various ways by which this subject can be made interesting and one of them is to use the ICT in teaching-learning. Teaching and learning with the use of technology has many advantages such as greater opportunities for students (Robert, 2012) and encouraging discovering learning (Binet, 1999). ICT adds new dimensions to the teaching and learning of mathematics, by helping a student to visualize certain mathematics concept (Voorst, 1999). Van Voorst (1999) and Hohnwater (2000) claimed that the visualization and exploration of mathematical objects and concept in multimedia environments can foster understanding in new ways. So, in the teaching and learning mathematics, especially geometry it is important for a student to understand the construction of shapes and the effect of changing in shapes by the use of ICT. The success of using ICT in teaching and learning depends on the use of appropriate software. In this context Geogebra is one of the interactive and dynamic software for teaching and learning mathematics.

#### **Review Of Related Literature:**

The researcher has seen many researches to find out the answer of the question that arouse in his mind. The descriptions of related studies are following-

Arbain & Shukor (2015) performed a quasi-experimental study to see the effectiveness of using Geogebra software on mathematics achievement among 62 students in Malaysia. The experimental group is the group of students was taught about how to use the Geogebra software to solve statistics problem while control group was without using Geogebra.

Results shows that students have positive perception towards learning and have better learning achievement using Geogebra.

*Bhagat & Chang (2015)* conducted a study with the aim to examine the impact of using the Geogebra on 9<sup>th</sup> grade students' mathematics achievement in learning geometry. A total of 50 students were selected from a government school located in the eastern part of India. The experimental group (25) was taught theorem on circles using Geogebra while the control group (25) was taught utilizing traditional teaching methods. At the end of the treatment, students' mathematics achievements were measured using a post-test. The result indicated that Geogebra is effective tool for teaching and learning geometry in middle school.

*Hutkemri & Zarkria (2014)* performed a study to see the effectiveness of using Geogebra on students' conceptual and procedural knowledge of limit function. In this study quasi-experimental method was used. A total of 138 students were involved in the experimental and 146 students were involved in control group for the study. Data were collected by using the conceptual and procedural test of limit function. The finding shows that the use of Geogebra has succeeded in increasing students' conceptual and procedural knowledge of limit function.

*Zegin, Furkan & Kuttaca (2012)* performed a study to determine the effects of dynamic mathematics software Geogebra on student achievement in teaching of trigonometry. The sample of study consists of 51 students. The experimental group was subjected to the lessons arranged with Geogebra software in computer assisted teaching method while control group was subjected to the lessons shaped with constructivist instruction. The data were collected after 5 weeks of treatment. Finding shows a meaningful difference between experimental and control groups' achievement in trigonometry. This

difference indicates a positive impact of utilizing Geogebra in enhancing students learning and understanding trigonometry.

*Akkaya, Tatar & Kagizmanli (2011)* studied with aim to prepare materials about symmetry which is one the subject of analytic geometry lesson in secondary education. For this purpose materials had been formed, which can assist students in taking symmetry of point and line in accordance with co-ordinate axes, origin,  $y=x$  and  $y=-x$  lines by paying attention to the directions on the given worksheet and as a result, internalizing the basic logic of the concept of symmetry.

*Dogan & Icel (2011)* performed a study with the aim to observe effects of dynamic mathematics software Geogebra on eight grade students for the subjects of triangles. The results showed that dynamic software Geogebra has positive effects on students' learning and achievements. It had also been observed that it improves students' motivation with positive impact.

*Saha, Ayub & Tarmini (2010)* performed a quasi-experimental study with non-equivalent control group post-test only designed was conducted to examine the effects of using Geogebra in the learning of co-ordinate geometry among students classified as high visual-spatial ability students (HV) and low visual-spatial ability students (LV). The results of the study showed that there is a significant difference in the mean mathematical achievement between the Geogebra group and traditional teaching group. Finding showed that the use of Geogebra enhanced the performance in learning co-ordinate geometry.

*Zerrin & Sebnam (2010)* studied to see the effectiveness of Geogebra on students' success at 12<sup>th</sup> grade mathematics subject parabola. In this study quasi-experimental method of control group of 102 students of class 12 and experimental group of 102 students of class 12 was used. The study found that

the teaching with materials, which prepared with Geogebra are more successful than traditional method.

*Dogan* (2010) conducted a quasi-experimental study to evaluate the success of students learning using the Geogebra software. The study found that the computer based activities with Geogebra software encouraged higher order thinking skills. The software was also found that having a positive effect in motivating students towards learning and retains their knowledge for a longer period.

#### **Research Questions:**

On the basis of above facts some questions arose in researcher's mind-

- i. Is the use of Geogebra in geometry teaching effective for improving student achievement?
- ii. Is there difference between the achievement of boys and girls by using Geogebra in teaching geometry?

#### **Objectives of the Study:**

The researcher has formulated following objectives for the study:-

- i. To study the effect of Geogebra on students' achievement in geometry of class IX.
- ii. To study the difference between the achievement in geometry of boys and girls by using Geogebra in class IX.

#### **Research Hypotheses:**

For this study researcher has formulated the following hypothesis-

- i. There is difference between the achievement of students taught by Geogebra-used-teaching and traditional teaching method.
- ii. There is difference between the achievement of male and female students taught by Geogebra-used-teaching method.

#### **Research Methodology:**

The applied type research conducted a quantitative method for the empirical study. On the basis of objective and hypothesis of study, the present study was conducted by using quasi-experimental procedure. The quasi-experimental study

with equivalent group post-test only design was conducted to examine the effect.

#### **Population:**

In this research, researcher has constituted the male and female students of class IX of CBSE affiliated English medium school of Bilaspur, (C.G.). There are 15 CBSE affiliated English medium school in Bilaspur, (C.G.), but it is very difficult for researcher to identify the whole population that is the total number of male and female students studying in IX class of these schools.

#### **Sample & Sampling Procedure:**

In the study, a sample of 45 students are selected from a CBSE English medium school. The sample has selected by the simple random sampling technique. The sample of 45 students consists of 22 male students and 23 female students which are divided into two groups- control and experimental group. Control group consist of 23 students and experimental group consists of 22 students (see table-1) with controlling the extraneous variables- locality, computer literacy and visual spatial ability.

**Table 1: Sample**

| Group        | Male | Female | Total |
|--------------|------|--------|-------|
| Experimental | 10   | 12     | 22    |
| Control      | 13   | 10     | 23    |
| TOTAL        | 23   | 22     | 45    |

#### **Procedure of conducting experiment:**

For the experiment, two groups of students had been selected - one is control group (23) and another is experimental group (22). Experimental group taught by using geogebra and Control group taught by traditional teaching method. For the teaching of Experimental group the lesson material is prepared by using geogebra. The content of teaching has constituted from the Euclidian geometry, Lines and Angles and Triangle of NCERT book of class IX. After 21 days of teaching activities a post-test has conducted for both the groups.

**Tool:**

A geometry achievement test has constructed to observe the students achievement in geometry of class IX. From this test researcher want to observe students' knowledge, understanding and application level of geometry. So this test consists of 30 questions from knowledge, understanding and application level of geometry.

**Statistics used:**

In this study, Mann Whitney U Test was used for analyzing the data and testing of hypothesis by using SPSS.

**Analysis And Discussion:****Analysis of data for first objective:**

**Objective:** To study the effect of Geogebra on students' achievement in geometry of class IX.

**Research hypothesis:**

There is difference between the achievement of students taught by Geogebra-used-teaching and traditional teaching method.

**Null hypothesis:**

There is no significant difference between the achievement score of students taught by Geogebra-used-teaching and traditional teaching method.

For analyze the testing hypothesis, the data has calculated by Mann-Whitney U Test by using SPSS. The mean rank and sum of the ranks of post test scores of the control group and experimental group is tabulated in table-2.

**Table-2**  
**Mean rank and Sum of Ranks for Mann-Whitney Test**

| Group        | Sample size (N) | Mean Rank | Sum of Ranks |
|--------------|-----------------|-----------|--------------|
| Control      | 22              | 28.20     | 620.5        |
| Experimental | 23              | 18.20     | 414.5        |

Table 2 indicates that the mean rank and sum of the ranks of post test scores of the experimental group is higher than control group. To test the significance of difference in the mean rank and sum of the ranks of post test scores of the control

**Table-3**  
**Significant different in the achievement scores of control group and experimental group**

| Test Statistics                   | Score   |
|-----------------------------------|---------|
| Mann Whitney U                    | 138.500 |
| Wilcoxon W                        | 414.500 |
| Z                                 | -2.613  |
| Assumption significant (2-tailed) | 0.009   |

group and experimental group, data were analyzed by Mann-Whitney U test and tabulated in table-3.

Table- 3 indicates that the Mann Whitney U score is 138.500 and Wilcoxon W score is 414.500. It also indicates that the Z score is -2.613, which is greater than 1.96 (critical Z score at significance level 0.05). Hence, this indicates that: There is significant difference between the achievement score of control group and experimental group.

**Analysis of data for second objective:**

**Objective:** To study the difference between the achievement of male and female student by using Geogebra in teaching geometry of class IX.

**Research hypothesis:** There is difference between the achievement of male and female students taught by Geogebra-used-teaching method.

**Null hypothesis:** There is no significant difference between the achievement score of male and female students taught by Geogebra-used-teaching method.

For analyze the testing hypothesis, the data has calculated by Mann-Whitney U Test. The mean rank, sum of the ranks and U value of post test scores of the male student and female student of control group are tabulated in table-4.

Table-4 indicates that the mean rank and sum of the ranks of post test scores of male students is higher than female students. To test the significance of difference in the mean rank and sum of the ranks of post test scores of male



**Table-4:**  
**Sum of ranks, Mean rank and U value**  
**for Mann-Whitney Test**

| Group  | Sample size(N) | Sum of ranks | Mean rank | U-value |
|--------|----------------|--------------|-----------|---------|
| Male   | 10             | 123          | 12.3      | 62      |
| Female | 12             | 131.5        | 10.96     | 76.5    |

**Table-5**  
**Significant different in the**  
**achievement scores of control group**  
**and experimental group**

| U <sub>calculated</sub> value | U <sub>table</sub> value |
|-------------------------------|--------------------------|
| 62                            | 29                       |

students and female students, data were analyzed by Mann-Whitney U test and tabulated in table-5.

Table-5 indicates that the Mann Whitney U score is 62, which is greater than 29 (critical U value at significance level 0.05). Hence, this indicates that: There is no significant difference between the achievement score of male students and female students.

#### **Conclusion:**

It is quite obvious in learning mathematics that we cannot ensure the full learning just by lecturing the subject. As this is totally a teacher-centered instruction, it cannot attract the attention of the students. According to Gagne, we have to attract the attention of the students first for involving in learning. For this we need materials that attract their attention. The fact that Geogebra is a computer software and students are somewhat interested in learning process. As the finding of the study, we can see that the success of

teaching with Geogebra is higher compared with that of conventional teaching without any gender biasness. Naturally, there is another reason for this, we can attribute it to Gardner's theory of multiple intelligences. Gardner states that a human being is born with 8 types of intelligences but some are dominant. Starting this study, with the application of Geogebra, more intelligences of students are aimed to be reached at, thus success is to be higher. Besides these, according to Edgar Dale's Cone of Experience, we remember 30% of what we hear but remember 80% of what we see, hear and utter. The results of the study exactly shows the application of these. With Geogebra, students are more involved in the teaching-learning process and more sense organs are appealed to, thus higher success is found. Therefore we can say 'Making more use of Geogebra in geometry teaching will be an important factor in an effective teaching and a successful learning'.

#### **Educational Implications:**

On the basis of above finding, we can say that Geogebra is effective tool for classroom teaching to improve student achievement. First of all, Geogebra can include practical contribution to mathematics education with proves a reality that computer based classroom activities can be effectively used in the teaching-learning environments. Secondly, Geometric facts, figures, shapes and their properties with actual conditions of constructions were observed by using the geogebra. Thus, the students have the chance to verify the condition by observing the geometric properties of shapes with all sufficient conditions.

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|---------------------------|------------|-------------|------------|
| Article Received on       | 08.10.2017 | Reviewed on | 18.10.2017 |
| Observations reflected on | 20.10.2017 | Modified on | 22.10.2017 |

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## **M-Learning: Opportunities and Challenges**

**Dr. Prakash Chandra Jena \***

**Key Words : Mobile Learning, ICT, E-Learning**

### **Abstract**

*Education and training is the process by which the wisdom, knowledge and skills of one generation are passed on to the next. Today there are two forms of education and training: conventional education and distance education. Mobile Learning offers modern ways to support learning process through mobile devices. The main purpose of this paper is to analyze various benefits and challenges of Mobile Learning in teaching and learning processes.*

### **Introduction**

Changes in the economic and social fundamentals call for transformation in the skills, capabilities and attitudes of the masses. This requires a shift in the delivery and pedagogy used in the current education system. ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers.

The term M-Learning or "Mobile Learning", has different meanings for different communities, that refer to a subset of E-Learning, educational technology and distance education, that focuses on learning across contexts and learning with mobile devices.

Mobile learning is, "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the

learner takes advantage of the learning opportunities offered by mobile technologies" (MOBlearn., 2003). In other words, with the use of mobile devices, learners can learn anywhere and at any time (Crescente and Lee, 2011).

Mobile learning is considered to be the ability to use mobile devices to support teaching and learning. Mobile learning involves the use of mobile technology, either alone or in combination with other information and communication technology (ICT), to enable learning anytime and anywhere. Learning can unfold in a variety of ways: people can use mobile devices to access educational resources, connect with others, or create content, both inside and outside classrooms.

Mobile learning also encompasses efforts to support broad educational goals such as the effective administration of school systems and improved communication between schools and families.

**Mobile Technologies for M-Learning**

Mobile technologies are an attractive and easy means to maintain literacy skills and gain constant access to information. They are affordable, can be easily distributed and thus hold great potential for reaching marginalized groups and providing them with access to further learning and development. Mobile technologies facilitate distance learning in situations where access to education is difficult or interrupted because of geographical location or due to post-conflict or post-disaster situations. Mobile devices and personal technologies that can support mobile learning include:

- E-book
- Out start, Inc.
- Handheld audio and multimedia guides, in museums and galleries
- Handheld game console, modern gaming consoles such as Sony PSP or Nintendo
- Personal audio player, e.g. for listening to audio recordings of lectures

(podcasting)

- Personal Digital Assistant, in the classroom and outdoors
- Tablet computer
- UMPC, mobile phone, camera phone and Smart Phone

Technical and delivery support for mobile learning include:

- 3GP For compression and delivery method of audiovisual content associated with Mobile Learning
- GPRS mobile data service, provides high speed connection and data transfer rate
- Wi-Fi gives access to instructors and resources via internet

**Value of Mobile Learning**

- It is important to bring new technology into the classroom.
- Devices used are more lightweight than books and PCs.
- Mobile learning can be used to diversify the types of learning activities students partake in (or a blended learning approach).

**Capabilities and Applications of Mobile Phone in Teaching and Learning**

| <b>Subject</b>                                  | <b>E-Learning</b>  | <b>M-Learning</b>  |
|---|--|--|
| Place   | lecture in classroom or internet labs  | learning anywhere, anytime   |
| P e d a g o g i c a l<br>Change                 | More text- and graphics based instructions<br>Lecture in classroom or in internet labs   | More voice, graphics and animation based instructions<br>learning occurring in the field or while mobile   |
| Instructor to<br>S t u d e n t<br>Communication | Time-delayed (students need to check e-mails or web sites)<br>Passive communication<br>Asynchronous<br>Scheduled   | Instant delivery of e-mail or SMS<br><br>Instant communication<br>Synchronous<br>Spontaneous   |
| Student to<br>S t u d e n t<br>Communication    | Face-to-Face<br>Audio-teleconference common<br>E-mail-to-e-mail<br>Private location<br>Travel time to reach to internet site<br>Dedicated time for group meetings<br>Poor communication due to group consciousness | Flexible<br>Audio and video-teleconference possible<br><br>27/4 instantaneous messaging<br>No geographic boundaries<br><br>No travel time with wireless internet connectivity<br>Flexible timings on 24/7 basis<br><br>Rich communication due to one-to-one communication, reduced inhibitions |

|                                      |  |   |
|--------------------------------------|--|---|
| Feed back to student                 | 1-to-1 basis possible<br>Asynchronous and at times delayed<br>Mass / standardized instruction<br>Benchmark-based grading<br>Simulations and lab-based experiments<br>Paper based   | 1-to-1 basis possible<br>Both asynchronous and synchronous<br>Customized instruction<br>Performance and improvement-based grading<br>Real-life cases and on the site experiments<br><br>Less paper, less printing, lower cost   |
| Assignments and Tests                | In-class or on computer<br>Dedicated time<br>Restricted amount of time<br>Standard test<br>Usually delayed feedback<br>Fixed-length tests  | Any location<br>24/7 Instantaneous<br>Any amount of time possible<br>Individualized tests<br>Instant feedback possible<br>Flexible-length/number of questions   |
| Presentations, Exams and Assignments | Theoretical and text based<br>Observe and monitoring in lab<br>Class-based presentations<br>Usually use of one language<br>Mostly individualized, component based group work<br>Paper-based assignment delivery<br>Hand-delivery of assignments at a particular place and time<br>Instructor's time used to deliver lectures | Practical oriented exams direct on site, hands-on based<br>Observe in the field and monitoring from remote location<br>1-to-1 presentations with much richer communication<br>Automatic translation for delivery of instructions in many languages (possible)<br>Simultaneous collaborative group work<br>Electronic-based assignment delivery<br>E-delivery of assignments at any place and time<br>Instructor's time used to offer individualized instructions and help |

- Mobile learning supports the learning process rather than being integral to it.
- Mobile learning can be a useful add-on tool for students with special needs. However, for SMS and MMS this might be dependent on the students' specific disabilities or difficulties involved.
- Mobile learning can be used as a 'hook' to re-engage disaffected youth.

#### **Opportunities**

- Relatively inexpensive opportunities, as the cost of mobile devices are significantly less than PCs and laptops
- Multimedia content delivery and creation options
- Continuous and situated learning support
- Decrease in training costs
- Potentially a more rewarding learning experience
- Readily available a/synchronous learning experience

#### **Benefits of M-Learning**

(Elias, 2011; Crescente and Lee, 2011):

- Relatively inexpensive opportunities, as the cost of mobile devices are significantly less than PCs and laptops
- Multimedia content delivery and creation options
- Continuous learning support
- Potentially a more rewarding learning experience
- Improving levels of literacy, numeracy and participation in education amongst young adults.
- Using the communication features of a mobile phone as part of a larger learning activity, e.g.: sending media or texts into a central portfolio,

#### **Challenges** (Technical challenges)

- Connectivity and battery life
- Screen size and key size
- Meeting required bandwidth for nonstop/fast streaming

- Number of file/asset formats supported by a specific device
- Content security or copyright issue from authoring group
- Multiple standards, multiple screen sizes, multiple operating systems
- Reworking existing E-Learning materials for mobile platforms
- Limited memory
- Risk of sudden obsolescence
- Security
- Work/life balance
- Cost of investment

#### **Social and Educational Challenges**

- Accessibility and cost barriers for end users: digital divide.
- How to assess learning outside the classroom
- How to support learning across many contexts
- Content's security or copyright infringement issues
- Frequent changes in device models/technologies/functionality etc.
- Developing an appropriate theory of learning for the mobile age
- Conceptual differences between e-learning and m-learning
- Design of technology to support a lifetime of learning
- Tracking of results and proper use of this information
- No restriction on learning timetable
- Personal and private information and content
- No demographic boundary
- Disruption of students' personal and academic lives
- Access to and use of the technology in developing countries
- Risk of distraction

- Mobile usage habits among different countries and regions

#### **Conclusions:**

The educational system of the 21st century must be oriented toward creating conditions that allow school students to act and learn freely in productive collaboration with their teachers, and also with their parents and other members of their community, local and global. There is a paradigm shift in learning. Mobile technologies are largely instrumental in shifting the emphasis in learning environments from teacher-centred to learner-centred; where teachers move from being the key source of information and transmitter of knowledge to becoming guides for student learning; and where the role of students changes from one of passively receiving information to being actively involved in their own learning. Wider availability of best practices and best course material in education, which can be shared by means of mobile education, can foster better teaching. Mobile education also allows the academic institutions to reach disadvantaged groups and new international educational markets and enabled education will ultimately lead to the democratization of education. Especially in developing countries like India, effective use of mobile education for the purpose of education has the potential to bridge the digital divide and helps in effective educational policymaking, planning, management, supervision and implementation of various schemes and programmes in various sectors of education in India.

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|----------------------------------|-------------------|--------------------|-------------------|
| <b>Article Received on</b>       | <b>20.09.2017</b> | <b>Reviewed on</b> | <b>25.09.2017</b> |
| <b>Observations reflected on</b> | <b>26.09.2017</b> | <b>Modified on</b> | <b>02.10.2017</b> |

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## **Study on Engineering Aptitude and Reasoning Ability of Under Graduate Students of Durg District**

**Bindu Kumari \* & Dr. Jubraj Khamari \*\***

**Key Words : Engineering Aptitude, Reasoning Ability**

### **Abstract**

*Employment in Engineering warrants for a variety of skills, Industry is increasingly looking for employees who can think holistically, who can innovate, who can work in teams, who can synthesize and who can think critically in decision making situation. Present engineering education system does check basic Mathematics and Scientific skills before selecting students for the course. This skill though important does not impart necessary aptitude for becoming a good engineer. This study tries to find the relationship of reasoning skill of an individual with his engineering aptitude. A strong positive correlation has been concluded in the study between reasoning skill of an individual and his engineering aptitude. A model to explain engineering aptitude of the graduate engineer has also been constructed and it has been concluded that more than 30 % of the engineering aptitude variation is on the account of individual reasoning ability.*

### **Introduction**

While the Indian advanced education framework has gained extensive ground as far as capacity creation and enrolment in technical institution is concerned, in the most recent decade, it slacks essentially as far as worldwide significance and competitiveness concern, of its graduates. The engineering graduates who pass-out from various institutions are unfit to be employable just after their education. Higher education generally includes colleges, universities and university level institutions.

The specific importance given to practical aspect of Engineering course. Secondly the students who are selected to become future engineers lack certain

aptitude that is crucial for success in engineering jobs.

This study also examines the employability skills of Engineering Graduates. Employability skills and aptitudes are general abilities that are expected to be possessed by individual to land most of the technical job, however desired aptitude additionally help one to remain in a employment and work his way to the top. While the desired aptitude will be dependable on some occupation, most Engineers will likewise need to have some broad abilities.

Irrespective of the position of the engineer such as design engineer, the chief engineer, or somewhere in between, one needs critical thinking and reasoning



skills. Most of the engineering profession relies on clear, concise, and rationale decisions and these decisions only come about through a structured process of thought.

Without a critical thinking and reasoning process for decision-making in place one might not be able to take decision which are agreeable to most of the stakeholders. Some reasons for developing critical thinking and reasoning skills for decision-making include:

1. It Leads to a replicable process for planning, researching, and presenting ideas, courses of action and recommendations. Processes make everything easy and it can lead to a good habit. Establish a process that becomes habit and marrying critical thinking with decision-making becomes second nature.
2. Saves time in transforming data into decision quality information. It also saves time for decision makers since the material they'll review is decision quality.

The reasoning skill can act as a important factor in developing the Engineering Aptitude among young engineering graduates. Though reasoning skills can be developed to some extent during the course of graduation it will be a good idea to select those student for entering into engineering course that do posses a high critical and reasoning skills.

The literature on aptitude and more specifically on engineering aptitude are considered by most academicians as a part of reasoning skills. There are very less studies available that analyze the relationship between engineering aptitude and reasoning skills

#### **Reasoning Ability:**

Critical thinking and ability to analyze situation with reasonable logic are essential aspect that one should posses while performing a technical task. As Angelo explained that,

*"Critical thinking does not simply develop as a result of maturation, but involves skills that are notoriously difficult to teach and learn, the problem as to how to raise students possible low critical thinking competency levels also deserves attention"* (Angelo, 1995, p. 6).

Because reasoning skills does not improve automatically as the age progress it is more desirable to explore different facets of reasoning. Historically many psychologist and academician have studied and explore different aspect of reasoning skills. Initially they experimented on animals rather than human to investigate whether reasoning skill improve with maturation or not. Thorndike (1898, p.552). In one of his experiment he put a cat in a box having puzzle like directions. He repeated this act again and again and concluded that initially the movement of Cat was random and as the time progress the movement become more orderly but you cannot conclude this result to the theory of Engineering.

Some psychologist think that reasoning still is important area to understand the conceptual formation in the mind of an individual, Kohler (1995) took a cognitive perspective while explaining the problem solving behavior.

#### **Engineering Aptitude:**

The present undergrads, in an innovation upgraded condition, are Expected that they would learn content at a quicker rate than any time in recent memory. While doing so they are expected to develop hard technical skills as well as soft people skill which are abilities important to be fruitful in the working environment as discovered and communicated in their research by Hofstrand, the management of these skill is an driver to develop economy of any country. and then by Shivpuri and Kim in 2004 assessed the skill gap that is prevalent for engineering graduate to become employable. ; Candy and Crebert indicated the difficulty graduate face while

transisting from academic environment to workplace.; *Martin et. al.* identified the skill set necessary for a graduate to excel in work place. *Tanyel, Mitchell, and McAlum.*

### **Methodology**

The broad methodology adopted for the study is descriptive in nature. The study is conducted during the period of six month during which the data was collected from Engineering student on their Engineering aptitude and reasoning skills.

### **Objective of the Study**

Following are the objectives of the study;

- 1.To measure the Engineering aptitude of the students.
2. To measure the reasoning ability of the Engineering college students.
3. To study the relationship between reasoning ability and Engineering aptitude of students

### **Hypotheses**

Following are the hypotheses of the study

- H<sub>1</sub>: The Engineering Aptitude of Male and Female students do not differ significantly.
- H<sub>2</sub>:The Reasoning Ability of Male and Female students do not differ significantly.
- H<sub>3</sub>:There is no significant relationship between Engineering Aptitude and Reasoning Ability of students.

### **Sampling Design**

In this study probability sampling design was used. For the study 183 First Year Engineering College Students of Durg-Bhilai region were selected out of which 115 are male and 68 are female.

The size of the sample was based on their respective share in population. approximately 4.5 % of the population.

### **Data Collection**

After zeroing out the ideal sample size, the roll list of the student in first year of B.E. courses as obtained to act as a sampling frame. Initially, the first stage stratified sampling was done to segregate

the sampling frame into two parts first consisting of Male Engineering College Students and Second strata consisting of Female Engineering College students.

Then in second stage the simple probability random sampling techniques was applied to identify 115 Male and 68 Female sample elements of Durg district.

### **Data Analysis and Results**

#### **Checking the Normality assumption:**

In order to perform statistical inferential analysis using parametric tests, the critical assumption is that the population follows the normal distribution. While collecting data from sample the variable reasoning aptitude and engineering aptitude of engineering graduate students were measured. The Normality Assumption was checked in the two strata, by plotting the Histogram and conducting Shapiroi -Wilk test for the two variables Reasoning Ability and Engineering Aptitude, so as to confirm the applicability of Inferential Statistical Technique. Shaipro-Wilk test result confirms the approximate Normal data for Reasoning Ability and Engineering Aptitude of both of the groups of Male and Female Engineering Students.

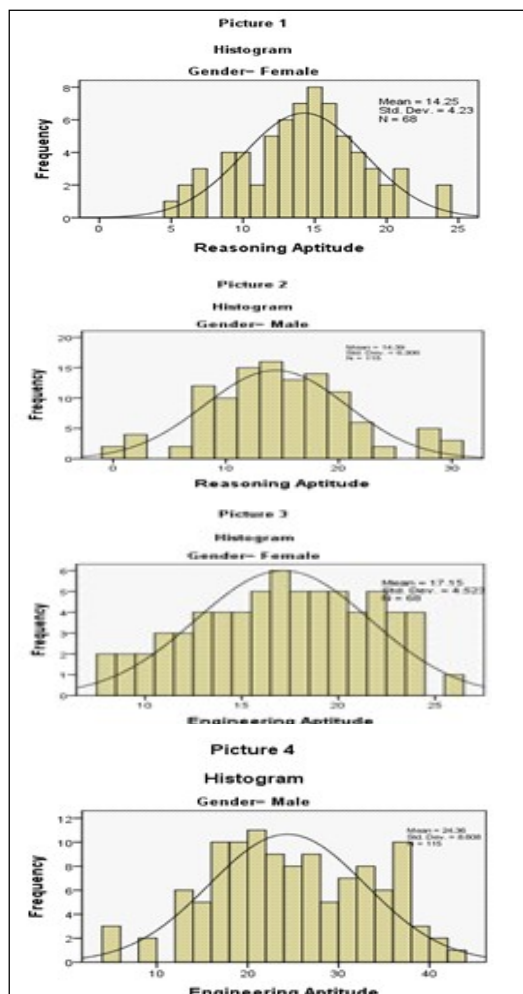
**Table-1-**  
**Tests of Normality**

| Variable    | Gender | Shapiro-Wilk |     |     |
|-------------|--------|--------------|-----|-----|
|             |        | Statistic    | df  | Sig |
| Reasoning   | Female | .985         | 67  | .59 |
| Ability     | Male   | .978         | 114 | .06 |
| Engineering | Female | .974         | 67  | .17 |
| Aptitude    | Male   | .974         | 114 | .03 |

The Normality assumption is further strengthenedby referring the approximate bell shaped curve drawn on Histograms of both of the variable for both of the groups of Male and Female Engineering Students.

#### **Descriptive Statistics:**

The descriptive statistics shows that the Reasoning Ability score of Engineering College student range from 0 to 30



with the mean score of 14.34 with the standard deviation of 5.612. Whereas the Engineering Aptitude have a minimum score of 5 to the maximum of 42 and it has the mean score of 21.68 with the standard deviation of 8.13. 68 with the standard deviation of 8.13.

It has been found the female Engineering Student have a mean score of 14.25 with a standard deviation of 4.2

**Table 2**  
**Descriptive Statistics**

| Variable             | N   | Min | Max | Mean | SD  |
|----------------------|-----|-----|-----|------|-----|
| Reasoning Ability    | 183 | 0   | 30  | 14.3 | 5.6 |
| Engineering Aptitude | 183 | 5   | 42  | 21.7 | 8.1 |

**Table 3**  
**Gender-wise analysis on RA and EA**

| Female            | N   | Min | Max | Mean | SD  |
|-------------------|-----|-----|-----|------|-----|
| Reasoning Ability | 68  | 5   | 24  | 14.3 | 4.2 |
| Engg. Aptitude    | 68  | 8   | 26  | 17.2 | 6.3 |
| Male              | N   | Min | Max | Mean | SD  |
| Reasoning Ability | 115 | 0   | 30  | 14.4 | 6.3 |
| Engg. Aptitude    | 115 | 5   | 42  | 24.4 | 8.6 |

for the Reasoning Aptitude and female have mean score of 17.15 with the sd. of 4.52 for the Engineering Aptitude score.

The mean value of Reasoning Aptitude scores of male students approximately 14.4 with a bit higher and sd. of 6.3 as compared to female group for the same variable. In the case of engineering aptitude male students have mean score of 24.36 with a high standard deviation of 8.60.

Hence it is concluded that there was not much of the difference in the mean score of Male and Female Engineering student score of Reasoning Ability whereas in measuring engineering aptitude the mean score obtained by males is much higher as that

**Table 4**  
**Independent Samples Test**

| Variables            | t     | df   | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
|----------------------|-------|------|-----------------|-----------------|-----------------------|
| Reasoning Ability    | .181  | 178. | .857            | .141            | .780                  |
| Engineering Aptitude | 6.399 | 181  | .000            | 7.209           | 1.127                 |

obtained by males is much higher as that obtained by female. This conclusion also directed us to investigate our 3<sup>rd</sup> and 4<sup>th</sup> research question, to investigate whether significant difference exist between male and female Engineering student regarding their reasoning and Engineering aptitude score. On conducting independent sample 't' test between male and female students on their score of reasoning ability and Engineering aptitude, it was found that there was no significant difference that exist between reasoning ability of male and female student. But there was a significant difference between Engineering aptitude score of male and female Engineering Student students. Hence out of the Hypothesis,  $H_1$  was accepted and  $H_2$  was rejected.

#### Correlation Analysis:

In order to investigate the hypothesis 3 the correlation analysis is been conducted between Reasoning Ability score and Engineering Aptitude score firstly for all Engineering students and then by grouping students Gender wise. The result of the analysis are given in the following table.

There are indications of strong positive correlation  $r=0.553$  between reasoning ability score and Engineering aptitude score of the Engineering Student students this correlation was found significant at 0.01 level.

The result shows that there is a strong significant correlation between Reasoning Ability score and Engineering Aptitude score of both of the groups of male and female students.

#### Predicting Engineering Aptitude on the basis of reasoning Ability Score:

During correlation analysis it was observed that there was high degree of significant correlation between Reasoning Ability Score and Engineering Aptitude Score of Engineering Students. It was then desired to investigate that to what extent we can predict the Engineering aptitude of student on the

**Table 5**  
**Correlations Analysis (Whole Group)**

| Variable             | Stat                 | Reason Aptitu. | Engg Aptitu. |
|----------------------|----------------------|----------------|--------------|
| Reasoning Aptitude   | Pearson Correlation. | 1              | .553**       |
|                      | Sig.(2-tailed)       |                | .000         |
|                      | N                    | 183            | 183          |
| Engineering Aptitude | Pearson Correlation. | .553**         | 1            |
|                      | Sig. (2-tailed)      |                | .000         |
|                      | N                    | 183            | 183          |

**Table 6**  
**Model Summary**

| Model | R                 | R <sup>2</sup> | Adj. R <sup>2</sup> | Std. Error of the Estimate |
|-------|-------------------|----------------|---------------------|----------------------------|
| 1     | .553 <sup>a</sup> | .306           | .302                | 6.794                      |

a. Predictors: (Constant), Reasoning Aptitude

**Table 7**  
**ANOVA<sup>a</sup>**

| Model        | SS      | df  | MS     | F    | Sig.              |
|--------------|---------|-----|--------|------|-------------------|
| 1 Regression | 3682.9  | 1   | 3682.9 | 79.8 | .000 <sup>b</sup> |
| Residual     | 8355.1  | 181 | 46.2   |      |                   |
| Total        | 12037.9 | 182 |        |      |                   |

a. Dependent Variable: Engineering Aptitude

b. Predictors: (Constant), Reasoning Aptitude

**Table 8**  
**Coefficients<sup>a</sup>**

| Model              | Unstand. Coeff. |         | Standrd Coeff. Beta | t    | Sig. |
|--------------------|-----------------|---------|---------------------|------|------|
|                    | B               | Std. Er |                     |      |      |
| 1 (Constant)       | 10.2            | 1.381   |                     | 7.37 | .00  |
| Reasoning Aptitude | .801            | .090    | .553                | 8.93 | .00  |

a. Dependent Variable: Engineering Aptitude

basis of reasoning ability score of students. For this a regression analysis was conducted where reasoning ability score was taken as predictor variable and Engineering aptitude score was taken as a dependent variable. The result is given in the following table—

It was observed from the analysis that Reasoning Ability Score was able to explain 30% of Variance in the Engineering aptitude of Engineering students. The result of Anova analysis indicates that the regression coefficient

has explain significantly the variation in the response variable.

The table of coefficient was able to determine the Model to predict Engineering aptitude of students based on the reasoning ability score.

Engineering Aptitude =  $10.18 + 0.8 * \text{Reasoning Ability}$

The coefficient of model the constant term and thee coefficient of reasoning ability was found to be significant.

### Findings

After analyzing the data following findings have been suggested—

1. Combined group score of means of reasoning ability and Engineering aptitude are 14.34 and 21.68 respectively and the standard deviation is 5.6 and 8.1 indicating that engineering aptitude has got higher deviation from mean score than reasoning ability.
2. For Female undergraduate engineering student the mean of reasoning ability is 14.25 with a standard deviation of 4.2 and for Male reasoning ability mean score is 14.4 with the standard deviation of 6.3 indicating that mean score of male and female on reasoning ability test is some what similar though male student have slightly higher variation.
3. For Female undergraduate engineering student the mean of Engineering Aptitude score is 17.15 with a standard deviation of 4.5 and for Male Engineering Aptitude mean score is 24.36 with the standard deviation of 8.6 indicating that mean score of male is much higher than female student on Engineering Aptitude and male students have very high variation in there Engineering Aptitude score.
4. The result of 't' test analysis confirm above mentioned statistics that there is a signifant difference in mean score of male and female stude on their

Engineering Aptitude score but in reasoning ability test both group of male and female student have found to have same mean score.

5. The result of correlation analysis indicate a high positive significant correlation between Engineering Aptitude score and reasoning ability score of value 0.55.
6. In trying to predict the value of Engineering Aptitude score on the basis of reasoning ability it has been found that linear regression model was able to explain 30.6% of variation in engineering aptitude on regressing it with reasoning ability.

### Conclusion

The importance of reasoning ability has been widely accepted as a parameter to improve professional efficiency. The research conducted on Engineering Student students shows that the male and female Engineering Student do not differ in reasoning ability but they do differ in their Engineering aptitude level. It has also been concluded there seem to be high and significant correlation between Engineering aptitude and reasoning ability of these students. Owing to this conclusion since direct questions of Engineering aptitude could not be asked in the entrance examination of Engineering Student it seems if the emphasis is given to the reasoning ability question in the entrance then there are higher chances that we will be able to select Engineering Student students who might develop higher aptitude for Engineering during their training.

It can also be concluded that since the reasoning ability score was able to explain approximately 45 % of variation in the Engineering aptitude score the weight age of reasoning ability in the entrance test should be somewhere close to 45 % of the total weight age.

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|---------------------------|------------|-------------|------------|
| Article Received on       | 28.09.2017 | Reviewed on | 28.09.2017 |
| Observations reflected on | 01.10.2017 | Modified on | 02.10.2017 |

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## **Employers Perspectives on Communication Skills of Fresh Engineering Graduates**

**Shubhangi R. Khambayat \***

**Key Words :** *Communication Skills, Engineering Education & Graduates*

### **Abstract**

*In general, the fresh engineering students are busy with competing for job positions with a global workforce, it would be better if we could measure their proficiency in the Communication skills in English, as it is the most widely spoken language in the world at present. An effective communication acts as a bridge to fulfil the gap between field of study and work and thereby making our pass-outs readily acceptable by the employer and industry. The demand and importance of communication skills has always been advocated in several assemblies, seminars and literature. However, it is observed that there is no data/ statistics available. The experience of persons associated with engineering education has also indicated that one of the significant factors adversely influencing quality of pass-outs is lack of communication skills among engineering students.*

*An attempt is made in this paper to investigate the level of communication skills among fresh engineering graduates. Employer's views were sought on Communication skills via a self-administered questionnaire. It assessed four core elements in Communication skills, including listening, speaking, reading and writing skills.*

### **Introduction**

There are a number of challenges being faced by the fresh engineering graduates and are concerned to make themselves more need based, effective, dynamic and responsive to the changes that are taking place in the industrial world. It is becoming more crucial as the Indian industries are facing growing competition at national and international level due to intensifying global economy.

As a result, the industry requirements, patterns of employment and occupations are undergoing a major transformation in terms of job spectrum and description of technical personnel,

their roles, responsibilities and duties. Like other educational systems, the engineering education needs to respond to the changing needs of the industry by continuously evaluating and updating curricula, introducing new courses, acquiring resources and facilities. This calls for developing competent technical work force for the Indian industry.

According to the NASSCOM report, 37 lakh graduates are coming out every year, however only 25% of them are employable in the IT-BPO sector. Especially when it comes to technical graduates, only 35-40% are readily employable. Further, while the industry is updating itself very

fast with the global market requirements our education system is still lacking. The irony with the Indian education system is that every year more than 3 million students graduate, but just 40-45 % of them are employable. Some of the major reasons includes, poor quality of teaching-learning combined with an outdated curriculum are to be blamed for this major issue. At the same time, not much emphasis is paid on developing skills like communication, technology etc.

This paper shares the results of study on the changing contexts of Communication skills through Employer's perspective via a self-administered questionnaire. It assessed the four core elements in Communication skills, including listening, speaking, reading and writing skills. The study finding shall be useful in preparing the Indian graduates to face future challenges.

### **Literature Review**

For conducting the study, literature was reviewed to acquaint with the work already done in the field regarding the significance of communication skills, as well, as how it affects the engineering graduates, and how it reflects the employment prospects of the graduates. The review of literature helped to identify growing need to undertake study work on present status of communication skills among fresh engineering graduates for enhancing employment prospects of graduates in the engineering education.

The review of literature mainly encompasses research work & studies related to topic within India and Abroad. As per review, communication mainly involves the exchange of ideas, opinions and information with a specific objective. Broadly, it is defined as a process of exchanging information, from the person giving the information through verbal and non-verbal methods, to the person receiving the information. The most common technique of communication is verbal, using a specific language where it is a two-way process, with

feedback on the message received. Apart from oral communication, information can also be exchanged using symbols or signage.

As per *Seiler & Beall* (2005), Communication is defined as sharing and giving meaning occurring at the same time through symbolic interactions. *Sulaiman Masri* (1997) said that Communication start when a message or information is transferred from the sender (the speaker, writer) to the receiver (listener, reader) through an instrument or channel, and followed by the receiver giving feedback through coding and interpreting the information.

Some researchers defined communication as verbal communication, written communication, non-verbal communication, listening and giving feedback (*Najmuddin*, 2010). Likewise, *Rodiah Idris* (2010) proposes that communication as a non-verbal skill, giving feedback, presenting ideas verbally and in written form, doing presentations and negotiating to achieve a goal and getting support/agreement.

As per these definitions, elements of communication include person-giving information, the information and feedback by receiver and repetition of these processes creates knowledge development. The process of communication generally involves four elements, which are the speaker, the receiver, communication channel and feedback. Communication is more effective, if the receiver (of the information) can understand and practice the core skills. Further, communication will be more meaningful, if the physical and social factors are taken into account during the communication process. A positive communication environment provides good opportunities to students to learn how to communicate and thus have better communication skills.

In the Indian context, engineering students' success in the on-campus recruitment is mainly based on their



demonstration of communication skills. According to Karnik, Former President, NASSCOM (National Association of Software and Services Company), only 25 percent of technical graduates are suitable for employment in the outsourcing industry because of their lack of abilities to speak or write well in English. (Karnik, 2007 as cited in P. Rayan 2008:1). Most students are not industry ready because they lack communication skills. (Infosys, 2008).

Communication skills are categorised in different ways. Broadly, it involves four core elements such listening, speaking, reading and written skills. As a result, engineering students need to be given enough opportunities to communicate in order to be better prepared for the job market after their completion of the engineering studies.

The National Board of Accreditation (NBA) mentioned the need of having communication skills as one of important attributes required among graduating engineer. The fresh engineering graduates will have to master communication skills in different cultural contexts. From review of literature, it was observed that in India very few research studies have been conducted on the Communication skills. An attempt was made to study the present status of communication skills among engineers. The aim was to understand better the level of Communication skills (listening, speaking, reading and written skills) among fresh engineering graduates from industry personnel/employers perspective for the colleges affiliated to the Rajiv Gandhi Technological University, Bhopal, M.P. to improve the communication skills among students.

### **Methodology**

A questionnaire was developed based on the available literature on communication skills and discussions with the field experts. The constructs of communication skills (listening, speaking, reading and written skills) in

this paper was determined based on the definitions of communication discussed earlier. The communication skills were measured based on a few sub-construct that was measured by a number of items. Industry Personnel/Employers were asked to respond on a five-point Likert Scale: a) Extent of Importance for successful performance on the job; Extremely Important, Very Important, Somewhat Important, Not Important, Not at all and b) Extent of Satisfaction from new Engineering Graduates; Very Satisfied, Satisfied, Somewhat Satisfied, Not Satisfied, Very Dissatisfied. The finalised questionnaire was then sent to three experts in the field of communication for validation. The validated questionnaire was then pilot tested among potential employers, which were involved in Campus placement of the final year.

In the present study, the reliability of the questionnaire was calculated using Reliability coefficient of the test by Split-Half Method. The reliability coefficient was estimated by splitting the whole Questionnaire into two parts of even & odd items. The questionnaire is divided into two halves selected to be as parallel as possible. The split-half reliability coefficient of the domain is the correlation between the total scores of the two half-tests corrected by the Spearman-Brown formula for the length of the full domain (Crocker & Algina, 1986).

The reliability coefficients found by the Split Half method for all the research questionnaires show good values of reliability of the constructed scale. This shows good internal reliability. The questionnaire was distributed to employers to seek their views on Communication skills among fresh engineering graduates, who were involved in the selection of fresh engineering graduates. Data from the questionnaire was analysed using SPSS (Version 20). The analysis of data pertaining to the present status of communication skills among fresh

engineering graduates of different background is given in the next section.

### ***Employers Perspective On Communication Skills of Fresh Engineers***

As per review of literature and various reports for the career success of Newly Graduated Engineers, Technical acumen alone is insufficient. "Communication Skills" plays an increasingly important role in preparing the engineering students for employment and career advancement. Fresh engineers/passouts needs Professional Communication Skills in order to be fully effective in Career and are essential for job success.

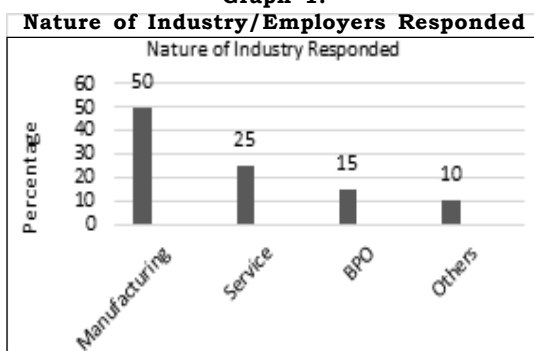
In this perceptive, industry personnel or employer views were collected through a questionnaire. The data were collected through the questionnaire by sending to current and prospective employers of engineering graduates in different fields. The views were sought on two major aspects, indicating the *EXTENT OF IMPORTANCE* of Communication Skills (Listening, Speaking, Reading and Writing Skills) on a five-point rating scale. In addition, the industry personnel/employers were asked to give their assessment on the *EXTENT OF SATISFACTION* of Communication Skills (Listening, Speaking, Reading and Writing Skills) from the newly recruited engineers on a five-point rating scale.

A total of 35 industry personal/employers responded in this study. The nature of industry who responded includes manufacturing, service and BPO industry. The respondents detail is shown in the graph1 as given below.

### **Findings and Discussion**

For the study, the fresh engineering graduates of four-year degree programme studied at Rajiv Gandhi Technological University [RGPV], Bhopal, M.P. were considered. During the engineering programme, all the graduates must have completed various activities and assignments that contributed to the development of their communication skills, which was explicitly or implicitly

**Graph 1:**



planned by the university and the individual lecturers. Therefore, fresh engineering graduate should demonstrate their skills in all sub-constructs of communication.

The overall responses indicating the extent of the importance and extent of satisfaction on the above aspects as indicated by the respondent are shown in the succeeding pages. The Graph 2 to 5 show the *Extent of Importance* of Communication skills as professional needs, comprising of Listening Skills, Speaking Skills, Reading Skills and Writing Skills. In addition, it also provides the assessment of the industry person/employers' assessment on the *Extent of Satisfaction* on the Communication Skills of the fresh engineering graduates.

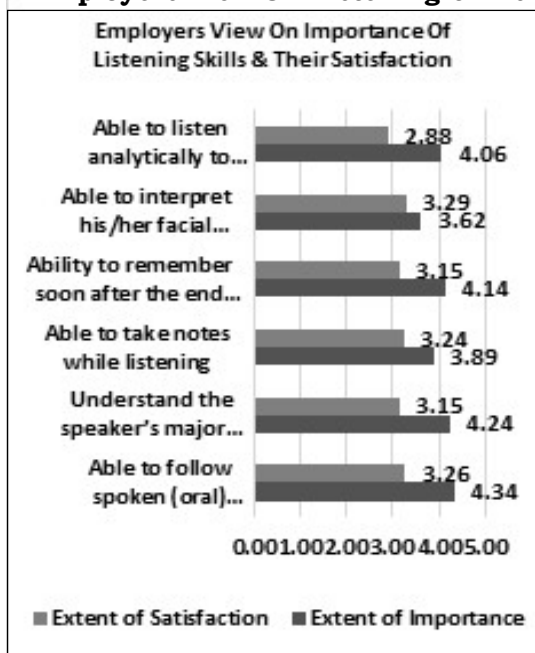
### **Listening Skills**

One of the important sub-categories of Communication skills is Listening skills; the following Chart shows the responses of industry personal on the extent of importance of Communication skills assessment on the extent of satisfaction on the Communication Skills from the fresh engineering graduates.

The Graph No. 2 given below shows the *Extent of Importance* of Listening Skills for professional needs and *Extent of Satisfaction* by the employers.

As per data shown in Graph 2, it can be concluded that fresh engineering graduates from RGPV have good communication skills. The industry employers view "ability to follow spoken (oral) instructions" have the highest mean

**Chart 2:**  
**Employers View On Listening Skills**



(4.34), as one of the important skill highly desired among the fresh engineering graduates as part of Communication skills. The skills such as ability to understand the speaker's major points and supporting points and the ability to remember soon after the end of the listening experience, the facts or ideas presented by the speaker(s) are found highly important.

As far as the extent of satisfaction by the employers, it is seen from the data that the sub-construct "*ability to listen analytically to improve own language skills*" have the lowest mean (2.88) compared to other sub-constructs. Followed by, a) ability to remember soon after the end of the listening experience, and b) understanding the speaker's major points & support points are highly essential to be developed among the engineering graduates.

Listening skills can be developed and nurtured through activities such as presentations, open discussions in a class or group. Further, listening skills can also be practiced outside of the

classroom through interviews. Although it should be the skill most used by students during tutorials, group discussions and presentations.

Listening skills needs two parties to work at the same time, while one is presenting his/her ideas, the other must listen and give feedback. Listening skills can be presented as showing interest and attention to what is being said although not necessarily showing agreement. Students need to show a readiness to listen and give attention while other people are talking and giving presentations. With that, they will be able to remember what has been presented, identify the key issues and give meaning to what was presented. The listener must also be able to appreciate the thoughts and feeling of the one giving the information.

### Speaking Skills

The second construct of Communication skills is Speaking skills. As a part of communication, there are four sub-constructs for speaking skills, which are negotiating, language, culture and be politeness. The sub-construct negotiates need the students to be able to discuss in various languages and cultural settings. The Graph No. 3 shows the *Extent of Importance* of Speaking Skills for professional needs and *Extent of Satisfaction* by the employers.

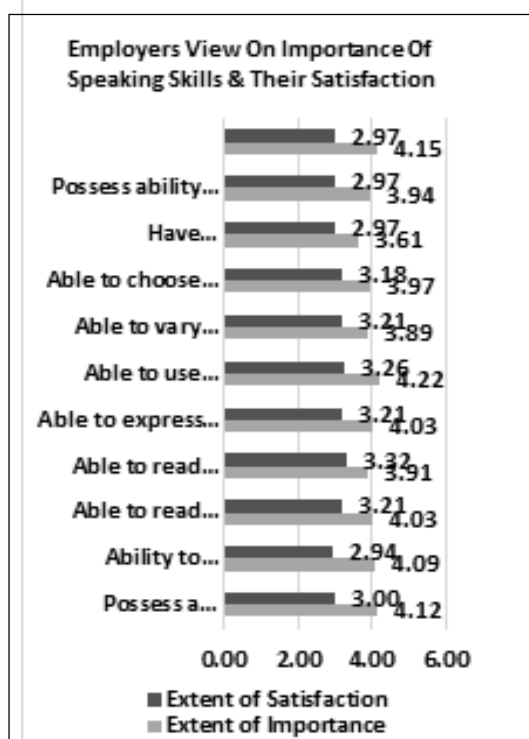
From the data shown in the Graph 3, it is observed that it is one of the important skills as part of Communication skills highly desired by the employers among the fresh engineering graduates. The skills such as "*able to use gestures which reflect confidence, sincerity and self-control*" have the highest mean score (4.22) as one of the important skill highly desired among the fresh engineering graduates as part of Communication skills. The skills such as, a) ability to convince and persuade (peers, superiors, subordinate and clients), and b) possessing a pleasant, flexible and clearly audible voice are found to be highly important.

Concerning the employers extent of satisfaction, it is seen from the data that, the sub-construct “*ability to converse properly with diverse group combining voice tone and non-verbal communication with appropriate language*” have the lowest mean (2.94) compared to other sub-constructs. Although it should be the skill most used by students during tutorials, group discussions and presentations. The competence in carrying on interesting and courteous discussions and conversations, and ability to lead a discussion as well as to participate, are required by the employers to be developed among the engineering graduates.

This type of communication needs to be carried out humbly and politely. This can be practiced during group discussion for a group project or assignment that consists of group members from different social and cultural background. Students need to discuss and negotiate the course of the project where everyone agrees. Speaking skills also involves interpersonal communication, which is the ability to conduct face-to-face interactions. This type of communication involves the ability to cooperate and negotiate with people from different backgrounds (Ihmeideh et al. 2010) and also involves social management skills.

Although the overall speaking skills among fresh engineering graduates are good, there are still certain aspects that are not up to the expectations of potential employers. Some of the skills under a few sub-constructs mentioned earlier needs to be improved. Speaking skills should be cultivated in every course and teachers must play a more significant. Faculty of Communication skills must give constructive feedback on students’ oral presentations and language skills wherever possible. On the other hand, students must actively participate in every activity that develops their speaking communication skills.

By giving positive environments for English speaking, it provides good

**Graph 3:**

opportunities for students to practice their skills and participate in the active learning. The faculty associated with teaching communication skills should create as many learning activities for students to give opportunity to horn their speaking skills.

### **Reading Skill**

The third essential sub-category of Communication skills is Reading skills; the following Graph 4 shows the responses of industry personal on the *Extent of Importance* of Reading skills assessment on the *Extent of Satisfaction* from the new engineering graduates.

From the data regarding the extent of importance by employers, it is seen from the data that, the sub-construct “*able to follow written directions, and to interpret what is asked for in various work situations*” have the highest mean (4.14) compared to other sub-constructs. It is observed that skills, such as a) ability to summarize content and make oral or written summary of what has been read,

b) ability to recognize main ideas, supporting details, sequence of events and casual relationships, c) able to draw appropriate conclusions, make inferences, and predict outcomes after reading, and d) able to restate main points of what is read orally are highly important.

As regards to the extent of satisfaction, it is seen from the data that the “*ability to restate main points of what is read orally*” have the lowest mean score (2.94) compared to other sub-constructs. Followed by, a) ability to read by word groups rather than word by word both in silent as well as oral reading, and b) possess competence and habit of using dictionaries and other reference books are highly required to be developed among the engineering graduates by the employers.

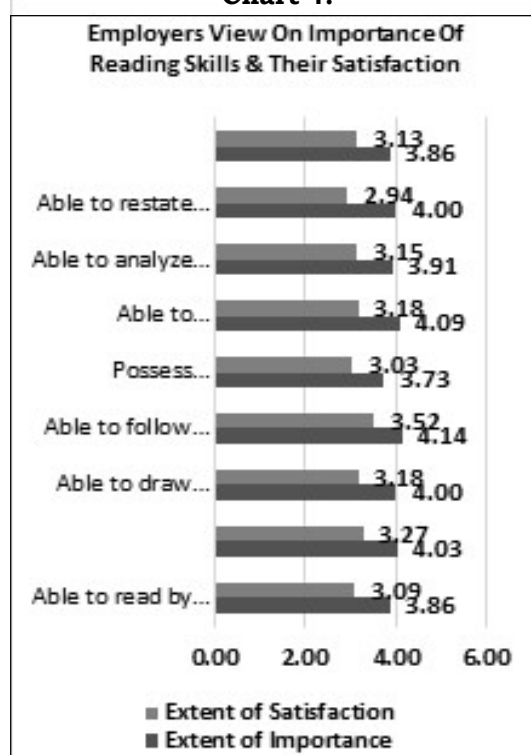
This aspect of communication skills can be developed through working on the written assignments and reports through their academic program at the university. Good reading communication skills are measured through the clarity of the writing, the flow of the arguments, using simple and easy to understand sentences, and written using academic writing style.

A reading communication also involves two parties, with the receiver giving feedback, but they do not necessarily have to communicate at the same time. Giving oral or written feedback can be measured through the ability to translate an idea and give meaning through written work. At the undergraduate level, written information should be specifically in English. This study found that the level of competency to communicate (verbally and written form) in English was lower.

#### Written Communication Skills

The last construct of communication skills is writing skills. From the data regarding the employers view on writing Skills importance and its satisfaction, as per Graph 5, it is observed that one of the

Chart 4:



important skills, as part of Communication skills is highly desired by the employers among the fresh engineering graduates.

As per data shown in the Graph, the skills such as “*able to write reports of various types (feasibility report, progress report, trouble-shooting report)*” have the highest mean score (4.24) compared to other sub-construct. Followed by, a) able to take down discussion notes and develop detailed write-ups from these notes, and b) able to prepare agenda for meetings and write minutes of meetings are highly important.

Regarding the employers view on the extent of satisfaction by the employers, it is seen from the data that “*ability to construct grammatically correct sentences in English*” have the lowest mean score (2.94) among other sub-construct. Followed by, a) ability to summarize in writing the given text and present highlights and significant features, b) use substitutes for words and

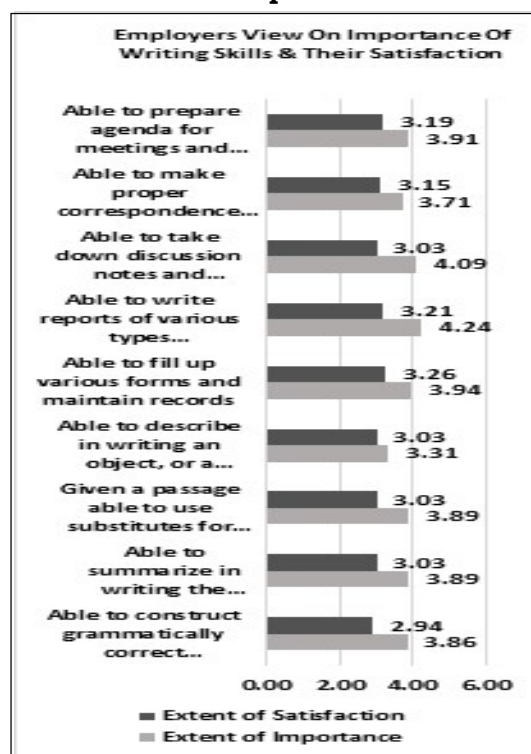
expressions, c) able to describe in writing an object, or a process or a procedure and d) able to take down discussion notes and develop detailed write ups from these notes are highly required to be developed among the engineering graduates.

This aspect of communication skills can be developed through completing written assignments and reports through their academic program at the university. Good written communication skills are measured through the clarity of the writing, the flow of the arguments, using simple and easy to understand sentences, and written using academic writing style. A written communication also involved two parties, with the receiver giving feedback, but they do not necessarily have to communicate at the same time. Giving written feedback can be measured through the ability to translate an idea and give meaning through written work. At the university level, written information should be in specifically in English. This study found that the level of competency to communicate (verbally and written form) in English was lower. This result is consistent with the findings of *Masita Misdi et.al.* (2010), where she reported that the level of competency in the English Language among students at institutions of higher learning in Malaysia is not satisfactory.

### Conclusion

There is a growing expectation that engineering institutions should cater to meet the needs of industry standards and deliver global engineers who are not only competent in technical skills but also in non-technical skills such as communication skills. In the present scenario, professional engineers certainly need effective and impressive communication skills. In this view, there is a great need

**Graph 5:**



to frame course material and develop methods and strategies to enhance various skills of communication of engineering graduates.

The study on the status of this communication skill will help in evolving strategies to enhance the same. The four sub-constructs of communication skills i.e. listening, speaking, reading and writing are skills that students should equip themselves with before they venture into the working world. These four skills can be combined and need to properly incorporated into the teaching-learning process. There is a need to improve everyday instructional practices to help our engineering students to develop and horn their communication skills that is essential towards their future career development.

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|---------------------------|------------|-------------|------------|
| Article Received on       | 09.10.2017 | Reviewed on | 15.10.2017 |
| Observations reflected on | 19.10.2017 | Modified on | 20.10.2017 |

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## **Influence of Social Media on Suicidal Ideation among Higher Secondary School Students**

**Jisha K. V. \***

**Key Words : Suicidal Ideation, Social Media**

### **Abstract**

*In India, Kerala shines in various aspects like literacy, secularism, technological pursuits, life expectancy and political upsurge, but bears impediments with respect to unemployment among educational youth, alcoholism, divorce and family breakdown. Despite these, one more factor needs to be added to the list. That is increasing suicide rate among adolescence. In the present study the investigator is aimed at finding out the suicidal ideation among the higher secondary school students due to the influence of social media use. The researcher adopted survey method for the present study. Suicidal ideation inventory and social media use Questionnaire were the tools used and developed by the investigator. Carl Pearson's product moment correlation, critical ratio were used as statistical techniques for the present study. The result will be helping the educationists to adopt suitable methods for solving problems among students.*

### **Introduction**

Adolescence is a fascinating period of life that marks the transition from being a dependent child to becoming an independently functioning adult. The adolescent develop new desires which were not present in the childhood such as more participation in social activities, desire for freedom, desire for identity etc. These new desires pose problems of adjustment in the new environment. If this problem of adjustment is not attended properly and psychologically, the adolescent is bound to develop inner conflicts. According to National Crime records Bureau (NCRB) reports 2012, all India suicide rate is 11.2/lack population. In Kerala shows suicide rate of 24.3/lack

population. Now a days social media play an important role for developing inner conflicts among adolescence. The unwarranted influence of media generates depletion in the value, culture, tradition etc. So to pay immediate attention for the reasons of increase of suicidal tendency among people.

### **Objectives of the Study**

- To find out the relationship between the social media use and suicidal ideation among higher secondary school students.

### **Hypothesis of the Study**

- There exists a significant correlation between the social media use and suicidal ideation among the higher secondary school students.



The researcher adopted survey method for the present study. A sample of 414 students studying XII std from various schools of Kannur, Kerala were selected. Suicidal ideation inventory and social media use Questionnaire were the tools used and developed by the investigator. Pearson product moment correlation coefficient and critical ratio were the statistical techniques used for analysing data.

### Data Analysis and Discussion

**Table 1**

**The result of correlation between Social media use and Suicidal Ideation**

| Variables correlated | Coefficient of correlation | Critical Ratio |
|----------------------|----------------------------|----------------|
| • Social media use   | 0.56                       | 2.3<br>p<.05   |
| • Suicidal ideation  |                            |                |

The investigator found out the linear correlation between social media use and

suicidal ideation and critical ratio are shown in the table 1.

The correlation coefficient between social media use and suicidal ideation for the whole sample was found to be 0.56 which is positive and substantial correlation. At 0.05 level of significance the obtained critical ratio of correlation is 2.3, which is in the acceptance region of the level. Thus we can conclude that there exist a positive relationship between social media use and suicidal ideation.

### Conclusion

The study revealed that the suicidal ideation is directly related to social media use. It is today's youth who have to be a part of the development of the country. So parents and teachers were provided good atmosphere for the proper development of the child. So awareness programmes for parents and teachers in schools is essential.

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|---------------------------|------------|-------------|------------|
| Article Received on       | 28.09.2017 | Reviewed on | 02.10.2017 |
| Observations reflected on | 06.10.2017 | Modified on | 10.10.2017 |

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## शिक्षा में सूचना एवं संचार प्रौद्योगिकी

उषा मकवाना \*

**Key Words :** सूचना एवं संचार प्रौद्योगिकी

### सारांश

तकनीकी और विकास मानव के शान्तिपूर्ण जीवन के लिये चुनौतियाँ प्रस्तुत कर रहे हैं। युद्ध के विनाशकारी अस्त्र, वातावरण की दूषितता एवं उल्टे-सीधे प्रचार व्यक्तियों के जीवन में विषमताओं को भर रहे हैं। विज्ञान के विकास का उपयोग मानव सेवा करने के लिये भावी पीढ़ी को शिक्षित करने की आवश्यकता है। संचार के माध्यमों का उपयोग सांस्कृतिक आदान-प्रदान के लिये तथा अन्तर्राष्ट्रीय सद्भावना को बढ़ाने के लिये सिखाना भी आवश्यक है। संचार के आधुनिक साधन जैसे टीवी/मोबाइल/वीडियो आदि ज्ञानवर्धक एवं मनोरंजन के उपयुक्त साधन होते हैं। अतः उपयोग में सावधानी बरती जाए अन्यथा ये नैतिक पतन के कारण भी हो सकते हैं। इन चुनौतियों को शिक्षक अपने शिक्षण द्वारा ही समझा सकता है। नवीन पीढ़ी को शिक्षित करने हेतु शिक्षकों द्वारा आधुनिकता के साथ-साथ भारतीय संस्कार, संस्कृति, आचार, विचार, मूल्यों की ओर भी ध्यान देना होगा। ताकि हमारी पीढ़ी में शिष्टता, मानवता, इन्सानियत, प्रेम-स्नेह, दया, करुणा आदि के गुण से युक्त शिक्षा के द्वारा नवीन पीढ़ी में वैज्ञानिक स्वभाव का उद्विकास हो और वह अन्धविश्वास और दूषित परम्पराओं को नष्ट कर सके एवं स्वस्थ, विकासमय राष्ट्र का निर्माण कर सके।

### भूमिका

प्राचीन काल से सूचना का महत्व रहा है। सूचनाओं के आदान-प्रदान हेतु लोग अलग-अलग तकनीकी अपनाने आये हैं। वर्तमान में यह प्रक्रिया बहुत आसान हो गई है, पहले लोगों को दूरदराज के क्षेत्रों में सूचना पहुँचाने के लिये काफी समय लग जाता था। वही आज कुछ पल में यह कार्य आसानी से हो जाता है। इस क्षेत्र में इतना ज्यादा विकास होने का प्रमुख कारण यह माना जा सकता है कि सूचना का हमारे लिये बहुत अधिक महत्व है।

सूचना ज्ञानार्जन का प्रथम सोपान होता है। इसके अभाव में कोई भी अध्ययन अनुसंधान और विकास का कार्यक्रम सफल और सार्थक नहीं हो सकता। वर्तमान समाज के प्रत्येक क्षेत्र आर्थिक, सामाजिक, सांस्कृतिक, शैक्षणिक, औद्योगिक, स्वास्थ्य, चिकित्सा, कृषि, विज्ञान, प्रौद्योगिकी, जनसुरक्षा आदि सभी का आधार और विकास सूचना पर ही निर्भर करता है। अतः इनके लिये सूचना का महत्व ज्यादा है।

सूचना की उपलब्धता ज्ञान के क्षेत्र को व्यापक बनाती

है। ज्ञान के परिक्षेत्र में सूचना एक तत्त्व है। जो किसी विशेष तथ्य अथवा विषय से संबंधित होती है और मानव संसाधन के विकास के क्षेत्र में इसके सम्प्रेषण से प्रगति और विकास ज्यादा होने की संभावनायें रहती हैं।

मनुष्य एक सामाजिक प्राणी होने के कारण विभिन्न प्रकार की मानवीय गतिविधियों और क्रियाकलापों से सीधा जुड़ा रहता है। समाज में जब किसी वस्तु की आवश्यकता होती है तो उस पर पहले शोध होता है और अनेक परिकल्पनाएँ जन्म लेती हैं और नये-नये विचार मानव मस्तिष्क में आते हैं, नये तथ्य उत्पन्न होते हैं। ये सभी क्रियायें सूचना की श्रेणी में आती हैं। सूचना देने के लिये कई क्रियाओं से गुजरना पड़ता है जैसे मौखिक रूप से सूचना देना, लिखित रूप से सूचना देना, संकेतों के माध्यम से सूचना देना आदि-आदि।

सूचनाएँ, विवेक, बुद्धि, दक्षता, ज्ञान आदि पर प्रत्यक्ष प्रभाव डालती हैं। सूचना शब्द से तात्पर्य - सन्देश, संकेत, प्रेरणा अथवा उत्तेजना से है। वर्तमान युग वैश्विकृत है, जिसमें तकनीकी के विकास में सूचना सम्प्रेषण ज्ञान का स्रोत है।

वर्तमान युग की जीवनधारा सूचना सम्प्रेषण तकनीक है। जब भी कोई नवीन तकनीक आती है, तो उसका उद्देश्य होता है कि वह अधिक उपयोगी ढंग से जनहित में प्रयुक्त हो, शिक्षा के परिप्रेक्ष्य में सूचना सम्प्रेषण तकनीकी की प्रभावशीलता शिक्षण एवं प्रशिक्षण में स्पष्ट रूप से दिखाई दे रही है।

सूचना सम्प्रेषण तकनीकी, वह तकनीकी है जो विश्व में किसी भी व्यक्ति के साथ कहीं भी घटित होने वाली घटना या प्रसंग के विषय में सम्पूर्ण ज्ञान उपलब्ध कराती है। इस तकनीकी ने शिक्षा के विकास की प्रक्रिया की गति को तेज कर दिया है तथा शैक्षिक संस्थानों में शिक्षण को नई दिशा प्रदान की है। सूचना सम्प्रेषण तकनीकी न केवल शिक्षा की गुणवत्ता में सुधार कर रही है बल्कि कक्षाओं के लिये श्रेष्ठ शैक्षिक सामग्री की उपलब्धता भी सुनिश्चित कर रही है। साथ ही इसके वेब सर्वर पर हर समय मौजूद रहने से इण्टरनेट के माध्यम से कोई भी विद्यालय अथवा छात्र शिक्षा का लाभ उठाने से वंचित नहीं रहेगा।

किसी भी देश के सामाजिक एवं आर्थिक विकास के लिये सूचना एक अत्यन्त ही महत्वपूर्ण संसाधन है। समाज में प्रत्येक व्यक्ति को अपने अधीन किसी उद्देश्य पूर्ति के लिये हर तरह की सूचना की आवश्यकता होती है। वर्तमान में हमारा देश सूचना के क्षेत्र में समृद्ध है। उपयोगी सम्पत्तियों की तरह सूचना भी एक सम्पत्ति के रूप में मानी जा रही है। यह सूचना रूपी सम्पत्ति तब उपयोगी होती है जब इसका सही उपयोग हो। इसलिये सूचना का मूल्य इस बात से निर्धारित किया जाता है सूचना का उपयोग कहा और किस प्रकार किया जाए। आज वही राष्ट्र समृद्ध और विकसित है जो सूचना के क्षेत्र में सचेत है, अग्रणी है, तेजी से हर क्षेत्र में आगे बढ़ रहे हैं।

आज किसी भी राष्ट्र के संसाधनों को उपयुक्त उपयोगी उत्पादों में परिवर्तित करने में सूचना एक संसाधन के रूप में अत्यधिक महत्वपूर्ण भूमिका का निर्वाह करती है। अर्थात् सूचना व्यवहार एक उद्योग की तरह विकसित किया जा रहा है इसलिये लोगों का जीवन स्तर सुधारने में भी सूचनाएँ महत्वपूर्ण स्थान रखती है। हम कह सकते हैं कि, कोई भी देश जिसके पास सूचना रूपी संसाधन है, वह निश्चित अन्य देशों की तुलना में उन्नतशील एवं विकसित देश है।

प्रौद्योगिकी ने हर सम्भव मार्ग से हमारे जीवन को पूरी तरह बदल दिया है। भारत एक सफल सूचना और संचार प्रौद्योगिकी से सज्जित राष्ट्र होने के नाते सदैव सूचना और संचार प्रौद्योगिकी (ICT) के उपयोग पर अत्यधिक बल दे रहा है न केवल अच्छे शासन के लिये बल्कि कार्य व्यवस्था के लिए।

संचार को हम विशाल अर्थ में व्यक्त कर सकते हैं। सूचनाओं के द्वारा व्यक्ति स्वयं के मस्तिष्क को प्रभावित करता है। यह केवल मौखिक एवं लिखित ही नहीं वरन् रंगमंच/चलचित्र/नृत्य/नाटक तथा मानवीय व्यवहार के सभी तरीकों से भी हो सकता है। सूचनाओं को प्रेषित एवं ग्रहण करने की प्रक्रिया संचार कहलाती है।

भाषा हमारे विचारों की अभिव्यक्ति का एक सशक्त माध्यम है। भाषा मानव जीवन का अभिन्न अंग है। सम्प्रेषण के द्वारा ही मनुष्य सूचनाओं का आदान-प्रदान एवं संग्रहण करता है। सामाजिक, आर्थिक, धार्मिक अथवा राजनीतिक कारणों से विभिन्न मानवीय समूहों का आपस में सम्पर्क बन जाता है। गत शताब्दी में सूचना और सम्पर्क के क्षेत्र में अद्भुत प्रगति हुई है।

इलेक्ट्रॉनिक माध्यम के फलस्वरूप विश्व का अधिकांश भाग आपस में जुड़ गया है। सूचना प्रौद्योगिकी क्रांति ने ज्ञान के नये द्वार खोल दिये हैं। बुद्धि एवं भाषा के मिलाप से सूचना प्रौद्योगिकी के सहारे आर्थिक समानता की ओर भारत अग्रसर हो रहा है।

सूचना प्रौद्योगिकी के बहुआयामी उपयोग ने विकास के नये द्वार खोल दिये हैं और नित खुल रहे हैं। भारत में (ICT) का क्षेत्र तेजी से विकसित हो रहा है। इस क्षेत्र में विभिन्न प्रयोगों का अनुसंधान करके विकास की गति को बढ़ाया गया है। (ICT) में सूचना, आंकड़े तथा ज्ञान का आदान-प्रदान मनुष्य जीवन के हर क्षेत्र में व्याप्त हो गया है। हमारे हर क्षेत्र में आर्थिक, राजनीतिक, सामाजिक, सांस्कृतिक, शैक्षणिक, व्यावसायिक तथा अन्य बहुत से क्षेत्रों में (ICT) का विकास दिखाई पड़ता है। इलेक्ट्रॉनिक तथा डिजिटल उपकरणों की सहायता से इस क्षेत्र में निरन्तर प्रयोग हो रहे हैं। आर्थिक उदारतावाद के इस दौर के वैश्विक ग्राम (ग्लोबल विलेज) की संकल्पना संचार प्रौद्योगिकी के कारण सफल हुई है।

इस नये युग में ई-कामर्स, ई-मैडीसीन, ई-एजुकेशन, ई-गवर्नेंस, ई-बैंकिंग, ई-शॉपिंग आदि इलेक्ट्रॉनिक माध्यमों के विकास का प्रतीक बनी है। कम्प्यूटर युग ने संचार साधनों में सूचना प्रौद्योगिकी के आगमन से हम सूचना समाज में प्रवेश कर रहे हैं। विज्ञान एवं प्रौद्योगिकी के इस अधिकतम देन से ज्ञान एवं इनका सार्थक उपयोग करते हुये उनसे लाभान्वित होने की सभी को आवश्यकता है।

सूचना प्रौद्योगिकी का अर्थ है सूचना का एकीकरण, भण्डारण, प्रोसेसिंग, प्रसार और प्रयोग यह केवल हार्डवेयर अथवा साफ्टवेयर तक सीमित नहीं है बल्कि इस प्रौद्योगिकी के लिये मनुष्य की महत्ता और उसके द्वारा निर्धारित लक्ष्य को प्राप्त

करना है। क्या मानव इस प्रौद्योगिकी को नियंत्रित कर रहा है? और इससे उसका ज्ञान संवर्धन हो रहा है?

पिछले कुछ दशकों से प्रौद्योगिकी ने हर संभव मार्ग से हमारे जीवन को पूरी तरह बदल दिया है। भारत एक सफल सूचना और संचार प्रौद्योगिकी से सज्जित राष्ट्र होने के नाते सदैव सूचना और संचार प्रौद्योगिकी के उपयोग पर अत्यधिक बल देता रहा है न केवल अच्छे शासन के लिये बल्कि अर्थव्यवस्था के विविध क्षेत्रों जैसे स्वास्थ्य, कृषि, शिक्षा आदि के लिये भी।

शिक्षा निःसंदेह एक देश की मानव पूंजी के निर्माण में दिये जाने वाले सर्वाधिक महत्वपूर्ण निवेशों में से एक है। यह एक ऐसा माध्यम है जो न केवल अच्छे साक्षर नागरिकों को गढ़ता है बल्कि एक राष्ट्र को तकनीकी रूप से नवाचारी भी बनाता है और इस प्रकार आर्थिक वृद्धि की दिशा में मार्ग प्रशस्त होता है। भारत में ऐसे अनेक कार्यक्रम और योजनाएँ जैसे मुफ्त और अनिवार्य प्राथमिक शिक्षा, सर्व शिक्षा अभियान, राष्ट्रीय साक्षरता अभियान आदि शिक्षा प्रणाली में सुधार लाने के लिये सरकार द्वारा आरम्भ किये गये हैं।

विगत दशक से इस बात में काफी जागरूकता आई है कि (ICT) को शिक्षा के क्षेत्र में उपयोग किया जाये जिससे शिक्षा के क्षेत्र में (ICT) ने सर्वाधिक महत्वपूर्ण योगदानों में से एक है।

शिक्षा किसी राष्ट्र के निर्माण की रीढ़ है। स्वतंत्रता के पश्चात् शिक्षा को प्रभावी एवं समीचीन बनाने हेतु अनेक प्रयास हुये हैं। उन्हीं प्रयासों के फलस्वरूप आज शिक्षक प्रशिक्षण कार्यक्रम की प्रभावी एवं अद्यतन बनाने की आवश्यकता अनुभव की जा रही है।

आज विज्ञान एवं तकनीकी का युग है। जीवन के प्रत्येक क्षेत्र में हम इनका उपयोग देखते और सुनते हैं। आज समाज की सभ्यता एवं संस्कृति के निर्माण में विज्ञान एवं तकनीकी महत्वपूर्ण भूमिका का निर्वाह कर रहा है। आज बढ़ते हुए वैज्ञानिक एवं तकनीकी प्रभाव ने लोगों में वैज्ञानिक दृष्टिकोण बना दिया है उनकी प्रकृति भी वैज्ञानिक बन रही है।

(ICT) की महत्ता को दृष्टिगत रखते हुए आवश्यक है कि शिक्षा के क्षेत्र में नवाचार की व्यापकता हो ताकि समय और आवश्यकतानुसार शिक्षा स्तर को विश्व से जोड़ा जाए। शिक्षा का क्षेत्र भी अत्यन्त महत्वपूर्ण हो। देश की रचनात्मक तथा विकासात्मक अवस्था के मूल में शिक्षा ही होती है।

आधुनिक मानव औद्योगिक क्रांति के बाद सूचना क्रांति के युग में प्रवेश कर चुका है। आजकल सूचना क्रांति ने मानव जीवन के प्रत्येक पहलू को अत्यधिक प्रभावित किया है। इस सूचना क्रांति ने भविष्य में अनेक चुनौतियों, अवसरों

एवं प्रतिस्पर्धाओं का सृजन किया है जिनके साथ सामंजस्य स्थापित करने के लिये सूचना एवं संचार प्रौद्योगिकी का अध्ययन करना अनिवार्य हो गया है। संचार प्रौद्योगिकी को कम्प्यूटर के नित नए विकास ने और अधिक प्रभावी बना दिया है तथा विस्तृत आयाम प्रदान किया है। यह संभव है कि शिक्षा के क्षेत्र से और अधिक प्रभावी संचार प्रौद्योगिकी जैसा नाम से ही ज्ञात होता है कि यह समय सूचनाओं को प्रभावित करने वाली प्रक्रिया है। यह सूचना प्रौद्योगिकी प्राथमिक रूप में इन कार्यों को करती है।

### शैक्षिक तकनीकी की आवश्यकता -

1. (ICT) शिक्षण प्रक्रिया को वैज्ञानिक, वस्तुनिष्ठ, स्पष्ट, सरल, रुचिकर व प्रभावशाली बनाती है।
2. (ICT) शैक्षिक समस्याओं के समाधान के लिये उचित मार्गदर्शन प्रदान करती है। जैसे - लक्ष्यों को निर्धारित करना, छात्रों के प्रारम्भिक व्यवहार की जाँच करना, पाठ्य वस्तु का चयन व आयोजन करना, उचित शिक्षण विधियों व व्यवहाराओं तथा सहायक सामग्रियों का चुनाव व आयोजन करना आदि से शिक्षण अधिगम प्रक्रिया को प्रभावशाली बनाती हैं।
3. (ICT) शिक्षक एवं विद्यार्थियों के मध्य विचारों के आदान-प्रदान में सम्प्रेषण को प्रभावशाली बनाती है।

### सुझाव :

1. (ICT) देश के उन्नत विद्यालयों में है। बहुत कम शिक्षकों को इसका ज्ञान है। व्यवस्था में सुधार कर अन्य शिक्षकों को प्रशिक्षित किया जाए।
2. शिक्षण/अधिगम में (ICT) के उपयोग को कम महत्वपूर्ण माना जाता है। नियोजन द्वारा इसकी महत्ता बनाई जाए।
3. शिक्षा क्षेत्र में (ICT) पर राष्ट्रीय नीति पर कार्य किया जाए।
4. (ICT) द्वारा शैक्षिक प्रबन्ध एवं प्रशासन की भूमिका का निर्धारण कर कार्य किये जाए।
5. ग्रामीण क्षेत्रों में उन्नत प्रौद्योगिकी तथा प्रबन्धकीय जनशक्ति की बेहद आवश्यकता है। सरकार को इस ओर ध्यान देना चाहिए।
6. वर्तमान और उभरती तकनीकी दोनों में सतत शिक्षा को प्रोत्साहन दिया जाए। इस हेतु पृथक से केन्द्र भी बनाये जायें।
7. (ICT) प्रोग्राम स्कूल स्तर से ही बड़े पैमाने पर आयोजित किये जाए।
8. शिक्षा महाविद्यालयों में (ICT) का सैद्धांतिक एवं व्यावहारिक का ज्ञान व्यवस्थित रूप से दिया जाये, अभी यह सतही तौर पर किया जा रहा है।
9. दूरस्थ शिक्षा प्राप्त कर रहे विद्यार्थियों के लिए (ICT) स्मार्ट

- कक्षा/वर्चुवल क्लास के माध्यम से शिक्षा प्रदान करता है।
10. पाठ्यक्रम को अद्यतन बनाने एवं आवश्यकताओं को पूरा करने एवं नवीनीकरण द्वारा नये सिरे से कार्य शुरू करना चाहिए।
11. व्यवसायिक शिक्षा के विस्तार में (ICT) पाठ्यक्रम को पढ़ाने के लिये पेशेवर प्रशिक्षित शिक्षकों की आवश्यकता पूर्ति की ओर सरकार को ध्यान देना होगा।
12. भारत कृषि प्रधान राष्ट्र है। ग्रामीण क्षेत्रों में संचालित होने वाली संस्थाओं में (ICT) हेतु पर्याप्त व्यवस्थाओं को निरूपण होना चाहिए ताकि नवीन व्यवस्था से सभी विद्यार्थियों को लाभ मिल सके।
13. शिक्षण में प्रयोग- (ICT) की पर्याप्त उपलब्धता अनिवार्यतः प्रत्येक संस्था में प्रशिक्षण प्राप्त शिक्षकों द्वारा होना चाहिए।
- आधुनिक युग को सूचना सम्प्रेषण तकनीकी (ICT) क्रांति का युग कहा जाता है। सूचना सम्प्रेषण तकनीकी ने मानव जीवन के प्रत्येक पक्ष को प्रभावित किया है। इसने मानव के लिए जीवनपयोगी सूचनाओं के सम्प्रेषण में अहम् भूमिका का निर्वाह किया है। भारत सरकार ने राष्ट्रीय शिक्षा मिशन सूचना सम्प्रेषण तकनीकी के अन्तर्गत करोड़ों रुपये का आवंटन किया है। आज के युग में सूचनाएँ वाणिज्यिक महत्व की वस्तु बनकर उभरी है और सूचना के बिना मानव जीवन शून्य नजर आता है।
- आज विज्ञान के युग में वैज्ञानिक तथा प्रौद्योगिकी आविष्कारों ने मानव जीवन के हर पक्ष को प्रभावित किया है, इनसे शिक्षा, शिक्षण तथा अधिगम भी प्रभावित हुये हैं। शिक्षा के क्षेत्र में नवीन अनुसंधानों, खोजों एवं अन्वेषणों के फलस्वरूप ऐसी-ऐसी तकनीकी कौशलों का विकास किया गया है, जिससे शिक्षा के उद्देश्यों को प्राप्त करने में पर्याप्त सहायता मिल रही है। इन दक्षताओं और कौशलों की विशेषतया विज्ञान पर आधारित है।

## संदर्भ ग्रंथ सूची

जीईडीडीएल 24 आईसीटी का विवेचनात्मक दृष्टिकोण,  
 पूरण मदान एवं सुभाष गर्ग. भारत में शिक्षा स्थिति समस्याएँ एवं मुद्दे

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| Article Received on       | 10.10.2017 | Reviewed on | 12.10.2017 |
| Observations reflected on | 18.10.2017 | Modified on | 22.10.2017 |

\* उषा मकवाना : सहायक प्राध्यापक, शासकीय शिक्षक शिक्षा महाविद्यालय, उज्जैन, मध्यप्रदेश

## राजकीय विद्यालयों में आईसीटी उपकरणों की उपयोगिता का समीक्षात्मक अध्ययन

डॉ. अमित कुमार दवे \* डॉ. पुनीत पण्ड्या \*\*

**Key Words :** सूचना सम्प्रेषण तकनीकी

### सारांश

प्रस्तुत शोध आलेख राजस्थान राज्य के राजकीय विद्यालयों में संचालित आईसीटी प्रयोगशालाओं की वस्तुस्थिति का अध्ययन है। इस आलेख में मूल्यांकित किए गए विद्यालयों के आधार पर आईसीटी व्यवस्थाओं की वास्तविक स्थिति बताने का प्रयास किया गया है। इस आलेख में प्रयोगशालाओं के साथ विद्यालयों में आईसीटी की स्थिति, सूचना संप्रेषण तकनीकी सम्बन्धी अध्ययन की आधारभूमि, सूचना एवं संप्रेषण तकनीकी के सम्बन्ध में संस्था प्रधानों के मत, सूचना एवं संप्रेषण तकनीकी के सम्बन्ध में अध्यापकों की स्थिति, विद्यार्थियों की स्थिति, अभिभावकों से की गई चर्चा से प्राप्त तथ्यों के आधार पर राज्य के विद्यालयों में सूचना संप्रेषण तकनीकी की वस्तु स्थिति देखने का प्रयास किया गया है।

### भूमिका

संप्रेषण मानव जीवन का ही नहीं अपितु जीव मात्र का प्राण स्वरूप है। संप्रेषण के माध्यम से सूक्ष्म जीवों से लगातार विकासमान मानव अपने आचार-विचार व्यवहार-इच्छा-भावना आवश्यकता आदि का परस्पर इज़हार करते हैं। संप्रेषण का सशक्त माध्यम भाषा है। सम्प्रेषण के माध्यम से आज का जीवन सहज व तीव्र हुआ है। वैश्विक ग्राम के रूप में परिणत होते विश्व को देखें तो मूल में सम्प्रेषण तकनीकी का आम जन के अधिकार में होना ही है। आज वैश्विक सूचनाओं के साथ स्थानीय सूचनाओं को जिस गति से प्रचारित एवं प्रसारित होते देखा जाता है उसके मूल में सूचना संप्रेषण तकनीकी ही कारक है। सूचना संप्रेषण तकनीकी के प्रभाव से वैश्विक व्यवहार का कोई भी क्षेत्र अछूता नहीं रहा है। चिकित्सा, निर्माण, समाज, राजनीति, शोध, शिक्षा, व्यापार, निवेश, संचार, खेल, साहित्य, कला के साथ हर क्षेत्र में सूचना संप्रेषण तकनीकी का प्रभाव स्पष्टतः देखा जाता है।

वैश्विक विकास का आधार शिक्षा के क्षेत्र में भी पिछले कुछ दशकों से सूचना संप्रेषण तकनीकी का सार्वत्रिक प्रभाव देखने को मिला है। जिनसे वैश्विक स्तर पर शिक्षा के ढाँचे के साथ आदर्श नागरिक व वैश्विक ग्राम निर्माण की संकल्पना

सार्थक होती नज़र आ रही है।

संप्रेषण हमेशा सहयोगात्मक होता है जिसमें सूचना दाता एवं सूचना गृहीता होना अनिवार्य है। सूचना दाता द्वारा जो सूचना प्रसारित होती है, वह सूचना गृहीता द्वारा अच्छे से प्राप्त की जाती है, तो ऐसी स्थिति में होने वाला सम्प्रेषण सफल व सार्थक सम्प्रेषण की शृंखला में आता है। आज हर क्षेत्र में सूचना संप्रेषण का तकनीकी के माध्यम से सफल उपयोग हो रहा है। सूचना संप्रेषण तकनीकी का प्रत्येक क्षेत्र में जितना सकारात्मक उपयोग होगा, उतना ही वह क्षेत्र विकास को प्राप्त करेगा साथ राष्ट्र व विश्व भी समृद्ध व सशक्त होगा।

### अध्ययन आधार

सूचना संप्रेषण तकनीकी की सार्थक उपादेयता एवं आम नागरिक की आवश्यकता को ध्यान में रखते हुए राज्य सरकार ने विद्यालयी शिक्षान्तर्गत सूचना सम्प्रेषण तकनीकी (ICT) क्रांति की शुरुआत की। इस क्रांति के अन्तर्गत राज्य व देश की नवीन पीढ़ी को अपने आरम्भिक काल से ही सूचना संप्रेषण तकनीकी की जानकारी से युक्त करने का लक्ष्य रखा। इस लक्ष्य की पूर्ति हेतु राज्य सरकार ने प्रत्येक राजकीय माध्यमिक एवं उच्च माध्यमिक स्तर के विद्यालय को आईसीटी प्रयोगशाला से युक्त करने का मानस बनाया। इसी लक्ष्य पूर्ति के अन्तर्गत

राज्य सरकार ने राज्य के 6500 राजकीय माध्यमिक एवं उच्च माध्यमिक (छात्र-छात्रा एवं सहशिक्षा विद्यालय सम्मिलित) विद्यालयों को सूचना सम्प्रेषण तकनीकी प्रयोगशाला (ICT Lab) से युक्त किया। इन आईसीटी प्रयोगशाला से युक्त विद्यालयों को दी गई सुविधा के आधार पर फेस -1, फेस -2, फेस -3 की श्रेणी प्रदान की गई। फेस -1 स्तर के विद्यालयों को सूचना संप्रेषण तकनीकी की सुविधा उपभोग के अन्तर्गत प्रारम्भिक स्तर पर रखा गया। इसी प्रकार फेस -2 स्तर के विद्यालयों को मध्यम एवं फेस-3 स्तर के अन्तर्गत विद्यालयों को सूचना सम्प्रेषण तकनीकी से सम्बन्धित सुविधाओं से युक्त, विडियो कॉन्फ्रेंसिंग एवं एजुसेट सेटअप से युक्तता की श्रेणी में रखा। राज्य सरकार द्वारा स्थापित आईसीटी सुविधाओं की विद्यालयों में वास्तविक स्थिति क्या है? प्रधानाध्यापकों की भूमिका क्या है? अभिभावक व छात्र सूचना संप्रेषण तकनीकी के प्रति कितने जागरूक हैं? छात्र विद्यालयों में आई.सी.टी. प्रयोगशाला का कितना उपयोग करते हैं? साथ ही आई.सी.टी. सम्बन्धी सामान्य जानकारी कितनी रखते हैं? प्राप्त जानकारी कहाँ से व कैसे प्राप्त करते हैं? यह जानने के प्रश्न सी.आई.ई. टी. एन.सी.ई.आर.टी. के आई.सी.टी. मूल्यांकन कार्य के दौरान मानस पटल पर उभरे। राजस्थान राज्य के उदयपुर संभागीय राजकीय विद्यालयों के सीआईईटी-एनसीईआरटी के मूल्यांकन मानकानुरूप वैयक्तिक, अवलोकन के आधार पर जानकारी प्राप्त की गई है।

#### विद्यालयों में आई.सी.टी.लेब की स्थिति

सी.आई.ई.टी.-एन.सी.ई.आर.टी. के आई.सी.टी. मूल्यांकन कार्य के सदस्य के रूप में राजस्थान राज्य के उदयपुर संभागीय आई.सी.टी. प्रयोगशालाओं से युक्त विद्यालयों की सूची जिलानुसार ब्लॉक के अन्तर्गत प्राप्त हुई। जिले के ब्लॉक के अनुसार यादृच्छिक रूप से प्रत्येक ब्लॉक से चार-पाँच विद्यालयों का अवलोकन करने पर ज्ञात हुआ कि राजकीय माध्यमिक एवं उच्च माध्यमिक विद्यालयों में सूचना संप्रेषण तकनीकी प्रयोगशालाओं की व्यवस्था तो राज्य सरकार के प्रयासों से है। किन्तु आधे से अधिक विद्यालयों में आईसीटी प्रयोगशालाओं का उपयोग नहीं किया जा रहा था। उपयोग नहीं किए जाने का प्रतिशत फेस -1 व फेस -2 स्तर के विद्यालयों का अधिक था। फेस -3 स्तर के विद्यालयों में आईसीटी सुविधाएँ फेस -1, 2 स्तर के विद्यालयों से अधिक पाई गई। फेस -3 स्तर के कुछ विद्यालयों ने तो प्रयोगशाला को बच्चों हेतु खुला छोड़ रखा था। बच्चे एवं अध्यापक सूचना संप्रेषण तकनीकी का आदतन उपयोग करने में समर्थ थे। यह राज्य सरकार के प्रयासों का सकारात्मक एवं गुणात्मक परिणाम था। किन्तु अधिकांश विद्यालयों में आईसीटी उपकरणों को बक्से में बन्द

कर रखना, बारिश से बचाने के लिए प्लास्टिक कवर से ढककर रखना आईसीटी सुविधाओं के उपयोग सम्बन्धी यथार्थ को दरकिनार करने वाली वास्तविकता थी। पालपादर आदर्श विद्यालय एवं कचहरी कपासन के विद्यालयों में साथी अध्यापकों का उत्साह एवं आईसीटी प्रयोगशाला की उपयोगिता सम्बन्धी व्यवस्था राज्य सरकार हेतु उदाहरण साबित हो सकती है। रा.आ.उ.मा.वि. बानसेन एवं चित्तौड़गढ़ फेस -3 श्रेणी में सुविधा का उपभोग कर रहे हैं एवं नवीन पीढ़ी को आईसीटी दक्ष करने की जिम्मेदारी का निर्वहन कर रहे हैं। तथापि सभी विद्यालय राजकीय के साथ वैयक्तिक स्तर पर आईसीटी उपयोग करने-कराने में समर्थ हों तो तस्वीर कुछ अलग दृष्टिपथ पर आ सकती है।

विद्यालयों को प्राप्त आईसीटी सुविधाएँ प्रशासन की दृष्टि से पर्याप्त थी किन्तु धरातलीय उपयोग के प्रति स्थानीय प्रशासन का रुख कुछ असंतोषप्रद था। प्राप्त सुविधाओं का यदि सकारात्मक उपयोग हो तो सरकार का आई.सी.टी. कौशल युक्त नागरिक का सपना शीघ्रपूर्ण हो सकता है। फेस -1,2, व 3 स्तर पर आईसीटी प्रयोगशालाओं हेतु कुछ ही विद्यालयों में सुविधाएँ थी। कुछ विद्यालयों में सुविधाएँ थीं किन्तु उपयोग नहीं के बराबर था। कुछ विद्यालयों में भवन सम्बन्धी समस्या भी थी। भवन सम्बन्धी समस्या के कारण उपकरणों को बक्सा बंद करके भी रखा गया था।

#### आई.सी.टी. के सम्बन्ध में संस्था प्रधानों के मत

सूचना संप्रेषण तकनीकी की विद्यालयों में वास्तविक स्थिति के मूल्यांकन कार्य के दौरान संस्था प्रधानों से भी विषयगत चर्चा करने का अवसर मिला। संस्था प्रधानों से भी सूचना संप्रेषण तकनीकी के सम्बन्ध में पत्रक भौतिक एवं ऑनलाईन भरवाना था। कुछ विद्यालयों में संस्था प्रधान अतिशय जागरूक एवं आईसीटी का उपयोग करने वाले लगे तो कुछ विद्यालयों के संस्था प्रधान उम्र एवं कार्यों की दुहाई देते हुए इससे दूर दिखे।

सूचना देने में अधिकांश संस्था प्रधान सहज थे। उन्होंने वास्तविकताओं को प्रदर्शित किया एवं विद्यालयों के आईसीटी द्वारा किए जाने वाले कार्यों यथा 'शाला दर्पण, प्रवेश, टी.सी, बिल, स्थानान्तरण, कार्य ग्रहण, कार्य मुक्ति आदि को प्रस्तुत करते हुए विद्यालय में आईसीटी के उपयोग की यथार्थ स्थिति पर प्रकाश डाला। साथ ही आई.सी.टी. प्रयोगशाला के उपयोग करने, न करने के सम्बन्ध में सार्थक तर्क देने का प्रयास किया। उपयोग करने वाले विद्यालयों ने प्रयोगशाला प्रभार या तो विषयाध्यापक को अथवा अनुबन्धित कम्प्यूटर अनुदेशक को दे रखा था। संस्था प्रधान आईसीटी प्रयोगशालाओं के संचालन को लेकर संतुष्ट नहीं थे। आईसीटी प्रयोगशालाओं

के सफल उपयोग हेतु नियमित कम्प्यूटर अनुदेशक नियुक्ति की इच्छा जाहिर की। साथ ही बताया कि आई.सी.टी. उपकरणों की खराबी होने, उन्हें ठीक करवाने एवं रख रखाव में नित्य समस्याओं का सामना करना पड़ता है। अतः आई.सी.टी. प्रयोगशाला का नियमित उपयोग करना व छात्रों को करने देना कठिन कार्य है। अधिकांश संस्था प्रधानों ने ऑनलाईन गूगल प्रपत्र पूर्ण किया। कुछ ने भौतिक प्रपत्र ही पूर्ण किया। तथापि संस्था प्रधान राज्य सरकार एवं केन्द्र सरकार की इस आईसीटी सम्बन्धी की जाने वाली पहल से संतुष्ट व प्रसन्न थे।

#### आई.सी.टी. के सम्बन्ध में अध्यापकों का अभिमत

जिन विद्यालयों में सूचना सम्प्रेषण तकनीकी स्थिति देखनी थी। उन विद्यालयों में अध्यापकों/प्राध्यापकों से भी प्रपत्र भरवाने थे। कुछ विद्यालयों को छोड़कर अधिकांश विद्यालयों के अध्यापकों ने भौतिक रूप से ही प्रपत्र पूर्ण किए। इस दौरान पाया कि अध्यापक आईसीटी का उपयोग वैयक्तिक स्तर पर स्मार्टफोन के माध्यम से करते हैं। किन्तु विषय की दृष्टि से उत्साहित नहीं थे। विद्यालय में कभी भी अपने विषय को रोचक व सशक्त बनाने हेतु आईसीटी का उपयोग नहीं किया। अपवाद रूप में कुछ विद्यालयों के कतिपय अध्यापकों ने स्मार्ट फोन के माध्यम से शिक्षण कार्य सम्पन्न करवाने की बात कही तो कुछ के आईसीटी आधारित शिक्षण योजनाएँ तैयार होने के बावजूद सक्रिय सुविधाएँ नहीं होने के कारण पाठन नहीं करवा पाना बताया।

अपने अपने क्षेत्र के विशेषज्ञ के तौर पर अध्यापकों का परिचय हुआ। राज्य स्तर पर विद्यालयों की प्रतिभा को उजागर करने वाले अध्यापकों से भी चर्चा हुई। किन्तु आईसीटी का अथवा आईसीटी प्रयोगशाला का उपयोग कर अपने क्षेत्र अथवा विषय की जानकारी को रोचक, प्रभावी एवं सहज बनाने के प्रयास न के बराबर अध्यापकों द्वारा किए गए। अध्यापक अपने प्रयासों को आईसीटी आधारित कर विषय का शिक्षण कार्य करें तो शिक्षण एवं अधिगम सार्थकता के साथ छात्र, समाज, विषय एवं स्वयं के प्रति गुणात्मक परिणाम देने वाला साबित होगा।

#### आई.सी.टी. के सम्बन्ध में विद्यार्थियों की स्थिति

सूचना संप्रेषण तकनीकी के वैयक्तिक उपयोग के सम्बन्ध में विद्यार्थी सक्रिय थे। कस्बे के विद्यार्थी अधिक सक्रिय थे। सुदूर ग्रामीण क्षेत्र के विद्यार्थी आईसीटी सीखना तो चाहते थे, किन्तु सुविधाएँ पर्याप्त न मिल पाने के कारण इस क्षेत्र से वंचित थे। तहसील मुख्यालय के छात्र निजी तौर पर आईसीटी सीखते हैं। घर पर सामाजिक संचार उपकरणों का उपयोग करते हैं। छात्र एवं छात्राओं की जागरूकता का स्तर समान था। तथापि विद्यालयों में आईसीटी प्रयोगशाला का

कालांशवार, विषयवार अथवा इच्छानुसार उपयोग करने की व्यवस्था एक या दो विद्यालयों में ही दिखी। अन्य विद्यालयों को उक्त प्रकार की व्यवस्था अपने यहाँ लागू करने की पहल करनी चाहिए। विद्यालयों की वास्तविक स्थितियों से परे विद्यार्थी स्वयं के प्रयासों से आईसीटी उपयोग करने के क्षेत्र में जागरूक एवं सक्रिय थे। विद्यालयों की आईसीटी प्रयोगशालाओं को सुविधा सज्जित कर विद्यार्थियों हेतु स्वतंत्र रूप से खोल दी जाएँ तो सरकार के लक्ष्यों की प्राप्ति आसानी से की जा सकेगी। साथ ही छात्र आपसी सहयोग से खेल-खेल में आईसीटी का उपयोग करना सीख जाएँगे। विद्यार्थी सीखी हुई आईसीटी दक्षता को विषय से सम्बद्ध भी करने लगेंगे। आवश्यकता है तो बस विद्यालयों में आईसीटी सुविधाओं को बढ़ाया जाए। साथ ही उन्हें विद्यालय समय में विद्यार्थियों हेतु पर्यवेक्षण में उपयोग करने हेतु मुक्त/खुला रख दिया जाए। इसे समय विभागानुसार भी उपयोग हेतु मुक्त किया जा सकता है, साथ ही विषयानुसार भी।

#### अभिभावकों से की गई चर्चा से प्राप्त तथ्य

संभाग के यादृच्छिक विधि से चयनित न्यादर्श विद्यालयों में अभिभावकों से सामान्य चर्चा की गई। अभिभावक उच्च माध्यमिक स्तर पर अपने बच्चों को तकनीकी दक्ष भी करना चाहते हैं। कुछ अभिभावकों ने तकनीकी उपयोगिता हेतु घर पर उपकरण स्मार्टफोन, कम्प्यूटर आदि ला रखे हैं। वे भी चाहते हैं कि बच्चे सामान्यतः आईसीटी सम्बन्धी कार्य अपने स्तर पर कर लें। इस हेतु पास के कस्बों में निजी तौर पर आईसीटी प्रशिक्षण हेतु आईसीटी प्रशिक्षण केन्द्रों पर प्रवेश भी दिला रखा है। कुछ अभिभावकों का कहना था कि परीक्षाओं को ध्यान में रखते हुए घर पर स्मार्टफोन एवं कम्प्यूटर आदि को उनसे दूर रखा जाता है अथवा बन्द रखा जाता है। घर पर छात्र सुविधा का दुरुपयोग भी करते हैं। खेल खेलते हैं, गाने सुनते हैं, सारा दिन तक इन्हीं उपकरणों पर निकाल देते हैं, यह उचित नहीं। अधिकांश अभिभावक चाहते थे कि विद्यालय में विषय सम्बन्धी तकनीकी का उपयोग हो तो अच्छा। प्रतिभाशाली छात्रों को पूर्व की कक्षाओं में प्राप्त किए परिणाम के आधार पर लेपटॉप आदि भी प्राप्त हुए हैं। जिनका घर पर अच्छे से उपयोग होता है। साथ ही छोटे भाई-बहन उस उपकरण पर तकनीकी दक्षता सीखते हैं। अधिकांश अभिभावक विद्यालय की कार्यप्रणाली एवं तकनीकी जानकारी देने की सुविधा बढ़ाए जाने के पक्षधर थे। साथ ही स्थानीय लोग सहयोग देने की आवश्यकता पर सहयोग देने हेतु तैयार थे।

#### आईसीटी उपयोग की वस्तुस्थिति

राजकीय विद्यालयों में आईसीटी प्रयोगशाला एवं तत्सम्बन्धी कार्यकलापों का विशद अवलोकन चर्चा के पश्चात्



पाया कि सरकार द्वारा विद्यालयों में आईसीटी उपकरणों की व्यवस्था दी गई है। अधिकांश विद्यालयों में प्रयोगशाला स्थापित है किन्तु उद्देश्याधारित उपयोग नहीं लिया जा रहा है।

संस्था प्रधानों एवं अध्यापकों द्वारा उपकरण खराब होने एवं ठीक कराने के बजट को कहाँ समायोजित करना? सम्बन्धी समस्याएँ प्रस्तुत की गई। साथ ही उपकरणों की अनुपलब्धता एवं तकनीकी दक्षता से युक्त स्वयं का न होना भी बताया गया। अधिकांश संस्था प्रधान व अध्यापक स्मार्टफोन से युक्त थे। नेट पेक का निजी आवश्यकता हेतु उपयोग करते थे। साथ ही देखा कि संस्था प्रधान एवं साथी अध्यापक अन्य विभागीय पूर्तियाँ पूर्ण करने में व्यस्त रहते हैं। जिसके कारण कक्षा शिक्षण के अतिरिक्त प्रयोगशाला उपयोग सम्बन्धी समय नहीं निकाल पाते। तथापि अध्यापकों का आईसीटी प्रयोगशाला कालांश कक्षावार समय विभाग चक्र में उल्लेखित किया गया था। छात्र सूचना संप्रेषण तकनीकी सीखने हेतु उत्सुक पाए गए।

विद्यालय के अतिरिक्त घर पर निजी प्रयासों से तथा निजी उपकरणों से आईसीटी तकनीकी को आत्मसात करने का प्रयास जागरूक अभिभावकों के बच्चे करते हैं, ऐसा पाया गया। घर की स्थिति अच्छी नहीं होने के कारण अधिकांश बच्चों हेतु आईसीटी सीखने का विकल्प विद्यालय ही है। विद्यालयों में आईसीटी कौशल दक्ष अनुदेशक नियुक्ति की माँग हर विद्यालय के संस्था प्रधानों एवं अध्यापकों द्वारा की

गई। कहीं कहीं तो आईसीटी प्रयोगशालाओं की स्थिति विचारणीय थी तो कहीं कहीं प्रशंसनीय भी थी।

#### निष्कर्ष :

राज्य सरकार द्वारा विद्यालयों में स्थापित आईसीटी. प्रयोगशालाओं की वस्तुस्थिति का अवलोकन कार्य सीआईईटी. एनसीईआरटी विभाग के अन्तर्गत करने का अवसर मिला। 6500 विद्यालयों की सूची में से दक्षिणी राजस्थान के विद्यालयों की आईसीटी प्रयोगशालाओं की वास्तविक स्थिति का फेस -1, 2, 3 के आधार पर अवलोकन किया। फेस -3 को छोड़ फेस -1, 2 स्तर के विद्यालयों में आईसीटी प्रयोगशालाओं को सक्रिय करने की आवश्यकता है। आवश्यक उपकरणों एवं सुविधाओं के साथ भवन व आईसीटी कौशल दक्ष शिक्षक की माँग संस्था प्रधानों द्वारा की गई। विषयाध्यापक विषय को पुष्ट करने हेतु आईसीटी कक्ष का इस्तेमाल करते एवं स्वयं के आधार पर अतिरिक्त प्रयास करने से दूर ही लगे। छात्रों की स्थिति आईसीटी के सम्बन्ध में आशातिरेक रही। अधिकांश विद्यालयों के छात्र अपने निजी स्तर पर आईसीटी कौशल सीखे हैं व सीखने हेतु प्रयास करते हैं। अभिभावकों से चर्चा के दौरान ज्ञात हुआ कि आईसीटी का सीखने के साथ-साथ सकारात्मक प्रभाव तो है लेकिन नकारात्मक उपयोग के कारण घर पर उपकरणों को उनसे दूर व बन्द करके भी रखा गया है। निष्कर्षतः विद्यालयों में आईसीटी प्रयोगशालाओं एवं उपकरणों के उद्देश्यपूर्ण उपयोग हेतु समग्र प्रयासों का समायोजन राष्ट्रीय लक्ष्यों की प्राप्ति में सहायक होगा।

### संदर्भ ग्रंथ सूची

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| Article Received on       | 10.10.2017 | Reviewed on | 16.10.2017 |
| Observations reflected on | 18.10.2017 | Modified on | 22.10.2017 |

\* **डॉ. अमित कुमार दवे** : सहायक आचार्य, शिक्षा संकाय, जनार्दनराय नागर राजस्थान विद्यापीठ, डबोक, उदयपुर, राजस्थान E-mail: [amit.dave50@yahoo.com](mailto:amit.dave50@yahoo.com)  
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## शिक्षक प्रशिक्षण संस्थानों में आईसीटी. उपकरणों की उपलब्धता, प्रशिक्षकों द्वारा उपयोगिता तथा छात्राध्यापकों की संतुष्टि का अध्ययन

दिनेश कुमार जैन \*

**Key Words :** शिक्षक प्रशिक्षण संस्थान, छात्राध्यापकों की संतुष्टि

### सारांश

प्रस्तुत शोध आलेख, शिक्षक प्रशिक्षण संस्थानों में आईसीटी उपकरणों की उपलब्धता, शिक्षक प्रशिक्षकों द्वारा इस के उपयोग करने की योग्यता तथा छात्राध्यापकों का इस संदर्भ में संतुष्टि स्तर का अध्ययन करने से सम्बंधित है। वर्तमान युग में समस्त शिक्षकों के लिये आईसीटी. उपकरणों का ज्ञान अत्यन्त आवश्यक है। ऐसे में शिक्षकों को प्रशिक्षण देने वाले शिक्षक-प्रशिक्षक व उनसे संबद्ध संस्था में आईसीटी. से सम्बंधित संसाधनों की उपलब्धता स्तर क्या है इसका अध्ययन आवश्यक है। सभी छात्राध्यापक यदि अपने प्रशिक्षण के समय ही आईसीटी. का प्रयोग अपने प्रशिक्षकों से सीख ले तो शालाओं में इसका बेहतर ढंग से उपयोग कर सकेंगे। छात्राध्यापकों को शिक्षक प्रशिक्षण के दौरान ही आईसीटी प्रशिक्षण भी दिया जाना उचित होगा।

### प्रस्तावना

राष्ट्रीय अध्यापक शिक्षा परिषद ने सन् 2016 में शिक्षक प्रशिक्षण पाठ्यक्रम में परिवर्तन करने हुये समस्त शिक्षक प्रशिक्षण पाठ्यक्रम में सूचना प्रौद्योगिकी को अनिवार्य रूप से सिमिलित किया है। भारत सरकार के मानव संसाधन विकास मंत्रालय ने अपनी 65 वीं केब रिपोर्ट में यह कहा गया है कि आपरेशन ब्लेक बोर्ड के समान राज्य सरकार के साथ मिलकर वह समस्त स्कूलों में अब स्मार्ट बोर्ड व इंटरनेट के माध्यम से शिक्षा को अधिक रोचक व प्रभावकारी बनायेगा। ये संसाधन तो अभी हमारे सभी शिक्षण प्रशिक्षण संस्थानों में भी नहीं हैं। कम्प्यूटर, मोबाइल, इन्टरनेट जैसे संसाधन तो अब नवीन पीढ़ी के विद्यार्थियों की प्रमुख आवश्यकता बन गई है। वहीं इसका ज्ञान पुरानी पीढ़ी के शिक्षकों को न होना, उनके ही विद्यार्थियों के लिये असंतुष्टि का कारण बना रहा है। कई शिक्षक अपने आप को इस कारण अपमानित भी महसूस करते हैं कि, नवीन तकनीकी की जानकारी नहीं है। इन शिक्षकों को न तो आई. सी.टी. के क्षेत्र में प्रशिक्षित किया गया है, और न ही प्रशिक्षण संस्थाओं में प्रशिक्षण दिया गया है।

अध्ययन अध्यापन के क्षेत्र में कम्प्यूटर और मोबाइल

का प्रयोग एक प्रभावशाली संसाधन के रूप में तेजी से बढ़ रहा है। ग्रामीण संस्थानों की तुलना में नगरीय क्षेत्रों की संस्थानों के विद्यार्थियों को इन उपकरणों का उपयोग करते आसानी से देखा जा सकता है। ग्रामीण क्षेत्र के शिक्षक प्रशिक्षण संस्थानों में इसका प्रयोग बहुत कम होता है। इसका प्रमुख कारण आईसीटी के प्रति जागरूकता का न होना है। और शिक्षक प्रशिक्षण संस्थानों में इन संसाधनों की अनुपलब्धता है। जिन संस्थानों में नवीन तकनीकी का प्रयोग नहीं किया जाता वहाँ के विद्यार्थियों में स्वयं से प्रयास करके सीखने की रुचि भी बहुत कम होती है। इन समस्त तथ्यों को ध्यान देने पर यह स्पष्ट होता है कि सर्वप्रथम शिक्षक प्रशिक्षक को आईसीटी. का ज्ञान होने के साथ, उसमें उसके प्रयोग की ललक हो वह अपने विद्यार्थियों को प्रेरित कर सके।

### अध्ययन के उद्देश्य -

1. शिक्षक प्रशिक्षण संस्थानों में आईसीटी. संसाधनों की उपलब्धता का अध्ययन करना ।
2. शिक्षक प्रशिक्षकों में आईसीटी. की उपयोगिता स्तर का अध्ययन करना ।

3. शिक्षक प्रशिक्षकों में लिंग व क्षेत्र के आधार पर आई.सी.टी. की उपयोगिता स्तर में अंतर का अध्ययन करना।
4. शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता के प्रति छात्राध्यापकों की संतुष्टि स्तर का अध्ययन करना।

#### शोध प्रश्न

1. क्या शिक्षक प्रशिक्षण संस्थानों में आई.सी.टी. संसाधन की उपलब्धता पर्याप्त है ?
2. क्या क्षेत्र के आधार पर शिक्षक प्रशिक्षण संस्थानों में आई.सी.टी. संसाधनों की उपलब्धता में अंतर परिलक्षित होता है?
3. क्या सभी शिक्षक प्रशिक्षक आई.सी.टी. उपयोग में दक्ष हैं ?
4. क्या शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता से छात्राध्यापक संतुष्ट हैं ?

#### अध्ययन की परिकल्पनायें

1. पुरुष एवं महिला शिक्षक प्रशिक्षकों में आई.सी.टी. की उपयोगिता स्तर में सार्थक अंतर नहीं होगा।
2. ग्रामीण एवं शहरी शिक्षक प्रशिक्षकों में आई.सी.टी. की उपयोगिता स्तर में सार्थक अंतर नहीं होगा।
3. शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता के प्रति ग्रामीण एवं शहरी छात्राध्यापकों की संतुष्टि स्तर में सार्थक अंतर नहीं होगा।
4. शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता के प्रति पुरुष एवं महिला छात्राध्यापकों की संतुष्टि स्तर में सार्थक अंतर नहीं होगा।

#### शोध विधि -

प्रस्तुत शोध अध्ययन में सर्वे विधि का प्रयोग किया गया है।

#### न्यादर्श

प्रस्तुत शोध अध्ययन में न्यादर्श के रूप में बिलासपुर विश्वविद्यालय से सम्बद्ध 47 बी.एड. कालेज में से 06 नगरीय व 06 ग्रामीण क्षेत्र के बी.एड. कालेज का चयन यादृच्छिक विधि से लिया गया। इस प्रकार कुल 12 शिक्षक प्रशिक्षण संस्था में से प्रत्येक संस्था से 05 शिक्षक प्रशिक्षक व 15 छात्राध्यापक लिये गये। न्यादर्श के रूप में कुल शिक्षक प्रशिक्षक 60 व 180 छात्राध्यापकों को अध्ययन में सम्मिलित किया गया है।

#### शोध उपकरण -

प्रस्तुत शोध अध्ययन में निम्नलिखित शोध उपकरण यथा अवलोकन, साक्षात्कार व स्व निर्मित अनुसूची का प्रयोग किया गया है।

#### प्रदत्तों का विश्लेषण -

1. क्या शिक्षक प्रशिक्षण संस्थानों में आई.सी.टी. संसाधनों की उपलब्धता पर्याप्त है ?

प्रदत्तों के विश्लेषण से यह तथ्य सामने आया है कि, शिक्षक प्रशिक्षण संस्थानों में आई.सी.टी. उपकरण तो हैं, परन्तु छात्र संख्या के अनुपात में वे पर्याप्त नहीं हैं। शिक्षक प्रशिक्षकों से सम्बंधित आई.सी.टी. संसाधन उपलब्ध नहीं हैं।

2. क्या सभी शिक्षक प्रशिक्षक आई.सी.टी. के उपयोग में दक्ष हैं?
- शिक्षक प्रशिक्षण संस्थाओं के प्रशिक्षक आई.सी.टी. के उपयोग में अधिकतम 20 प्रतिशत तक ही दक्ष हैं।

3. क्या क्षेत्र के आधार पर शिक्षक प्रशिक्षण संस्थानों में आई.सी.टी. संसाधनों की उपलब्धता में अंतर परिलक्षित होता है ?

ग्रामीण शिक्षक प्रशिक्षण संस्थानों की तुलना में शहरी शिक्षक प्रशिक्षण संस्थान आई.सी.टी. संसाधनों के मामले में अधिक समृद्ध हैं।

4. क्या शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता से छात्राध्यापक संतुष्ट हैं ?

शिक्षक प्रशिक्षक, आई.सी.टी. का उपयोग यदा-कदा ही करते हैं। छात्राध्यापक आई.सी.टी. की उपयोगिता से संतुष्ट नहीं हैं।

#### परिकल्पनाओं का परीक्षण

1. पुरुष एवं महिला शिक्षक प्रशिक्षकों में आई.सी.टी. की उपयोगिता स्तर में सार्थक अंतर पाया गया महिला शिक्षक प्रशिक्षकों की तुलना में पुरुष आई.सी.टी. उपकरणों का अधिक उपयोग करते हैं।

2. ग्रामीण एवं शहरी शिक्षक प्रशिक्षकों में आई.सी.टी. की उपयोगिता स्तर में सार्थक अंतर पाया गया, शहरी शिक्षक प्रशिक्षक के द्वारा ग्रामीण की तुलना में आई.सी.टी. का अधिक उपयोग किया जाता है।

3. शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता के प्रति ग्रामीण एवं शहरी छात्राध्यापकों की संतुष्टि स्तर में सार्थक अंतर नहीं पाया गया।

4. शिक्षक प्रशिक्षकों की आई.सी.टी. उपयोगिता के प्रति पुरुष एवं महिला छात्राध्यापकों की संतुष्टि स्तर में सार्थक अंतर नहीं पाया गया।

#### निष्कर्षों की विवेचना व सुझाव

1. शिक्षक प्रशिक्षण संस्थानों में आई.सी.टी. के उपकरणों के अन्तर्गत केवल कम्प्यूटर को ही पर्याप्त समझा गया है जबकि शिक्षक प्रशिक्षकों को प्रशिक्षण के लिये अन्य उपकरणों की जरूरत पड़ती है वे उपलब्ध नहीं हैं, केवल एक प्रशिक्षण संस्था में स्मार्ट बोर्ड उपलब्ध तो है पर उसका भी उपयोग छात्रों के बीच कभी नहीं हुआ। इसलिये शिक्षक प्रशिक्षण संस्थाओं में छात्राध्यापकों के अनुपात में सभी प्रकार के आई.सी.टी. उपकरण की उपलब्धता एवं उसका प्रशिक्षण सुनिश्चित किया जाना चाहिये।

2. आई.सी.टी. उपकरण के समस्त संसाधन एक ही व्यक्ति द्वारा नियंत्रित हों और अन्य शिक्षक प्रशिक्षक को वह आवश्यकता पड़ने पर उपलब्ध कराये, प्रशिक्षित करने और उपयोगिता को सुनिश्चित करने का दायित्व भी उसी का हो। सभी शिक्षक प्रशिक्षकों के लिये सप्ताह में कम से कम दो कक्षाएँ आई.सी.टी. आधारित हों।
3. छात्राध्यापकों को भी अपने अभ्यास प्रशिक्षण के दौरान कम से कम 50 प्रतिशत कक्षाओं का अध्यापन आई.सी.टी. बेसुद कर दिया जावे, ताकि छात्राध्यापक उनके पाठ्यक्रम में शामिल आई.सी.टी. के व्यावहारिक उपयोग को समझ सकें।
- उपकरणों की उपलब्धता यदि अभ्यास शालाओं में न हो तो प्रशिक्षण संस्था बारी-बारी से इसे उन्हें उपलब्ध कराये, जिससे वे अभ्यास शालाओं में इसका उपयोग कर सकें।
4. शिक्षक प्रशिक्षकों को आई.सी.टी. उपकरणों का प्रशिक्षण दिया जाना चाहिये एवं महिला शिक्षक प्रशिक्षकों को इसके उपयोग हेतु प्रेरित करना चाहिये।
5. छात्राध्यापकों को भी आई.सी.टी. के माध्यम से अपने विषयवस्तु के संग्रहण के लिये प्रेरित करें व उन्हें प्रयोगशाला उपलब्ध हो, इससे उनमें संतुष्टि स्तर में वृद्धि होगी।

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|---------------------------|------------|-------------|-------------|
| Article Received on       | 10.10.2017 | Reviewed on | 16 .10.2017 |
| Observations reflected on | 18.10.2017 | Modified on | 22.10.2017  |

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