The Digital Literacy in Teachers of the Schools of Rajouri (J&K)-India: Teachers Perspective

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Abstract: The present age is the age of information. The globalization has affected every sphere of the life including education. In spite of availability of ICT infrastructure in schools, their potential is underutilized because of digital incompetence of the teachers. New digital technologies are acting as a catalyst towards improvement of learning outcome and enhancing quality of education, but only introduction of such technologies in schools for producing change and innovation is not enough, it requires digitally competent teachers to facilitate the use of ICT in education. These teachers will act as facilitators and mentors to students to lead them towards problem solving and innovation to meet the new challenges of globalization. Teachers must be able to create learning environments which are student centric and foster creativity, Meta cognition, meta-literacy, collaboration and communication in learners. Mere superficial use of ICT in teaching will not yield the required learning outcome, but the integration of ICT in pedagogy is important to enhance teaching, learning process. This can be done only when teachers are competent enough to use ICT tools and facilitate ICT integrated education. In this paper, we tried to assess the teacher's perspective about the ICT and investigate the factors responsible for resistance of teachers in using ICT in schools and suggestive measures for successful integration of ICT in the teaching process by the teachers of Rajouri district (J&K, India). The ICT skills are very important for teachers to support alternative modes of teaching, learning, i.e. e-learning, mobile learning in the present outbreak of pandemic disease caused by Coronavirus-COVID19.

Index Terms: Digital Literacy, ICT integrated education, Digital Platforms, E- Content and Online Educational Resources.

1. Introduction

Across over 0.65 million villages and most of the people in India, the digital literacy is almost nonexistent. We are the second fastest growing mobile market in the world and in this way, giving rise to a big digital platform. To provide internet connectivity is one of the top priorities of government. In this era of machine intelligence, to prepare for the wave of digital transformation, building digital skills is very essential. A recent report by Digital Empowerment Foundation indicates 30% of our population lags basic literacy and 90% for digital literacy. The government launched Digital India in 2015 to empower digital literacy in every citizen. While its benefits are unquestionable, challenges remain, included infrastructure development, bandwidth availability, personal computer penetration and the capability to scale.

Digital literacy is the ability to use information and communication technologies to find, evaluate, create and communicate information, requiring both cognitive and technical skills[1]. Huller Spires of North Carolina State University views digital literacy in the three buckets:

- Finding and consuming digital content
- Creating digital content
- Communicating or sharing[2]

India's National Digital Literacy Mission trains people to operate digital devices and to access the government's e-governance services at its basic levels. Digital literacy allows people to interact and communicate with family and friends on a regular basis. It is able to find, evaluate, utilize and create content using information technologies and the internet[3]. In recent past, Government of India has worked hard in expansion of school infrastructure, but the quality of education is still a major concern in our country. NAS (National Achievement Survey) conducted by NCERT (National

Council for Educational Research and Training) in coordination with MHRD (Ministry of Human Resources and Development) indicates a low learning outcome in schools of Union Territory of Jammu and Kashmir[4].

2. ICT in education.

ICT has caused a paradigm shift in education, transforming it by providing new opportunities of teaching, learning and the use of open educational resources that can increase educational productivity[5]. ICT can result in reduced costs associated with instructional materials or program delivery and better utilization of teacher time, links, teachers and students provide access to professional content, resources, and systems to help them improve the instruction and personalize learning[6]. ICT as a pedagogical tool can improve teaching, learning process resulting in increased educational outcome by improving student engagement and motivation, and accelerate learning process[7].

2.1. Benefits of using ICT in education

- Dynamic
- Ubiquitous learning
- Adaptive
- Differential learning
- Learner centric learning
- Real time interaction
- Information available in multiple formats
- Instant and continuous feedback
- Motivation
- Increased engagement
- Multisensory stimulation
- Economic
- Critical thinking
- Fosters creativity
- Higher order thinking[6]
- Meta cognition
- Meta literacy
- Project based learning
- Flexible learning
- Self-paced learning
- Distance and open learning
- Digital literacy skills
- Effective[8].
- Scalability
- Updated content available
- Increased educational outcome
- Supports constructivism[9].
- Time saving
- Faster content delivery[10]
- Easy assessment
- Encourages collaboration[11].

With the decreased cost of hardware and software devices and increased internet bandwidth available at low costs, With mobile and other wireless devices like Internet of Things and artificial Intelligence becoming increasingly a part of life across every industry today, it only makes sense that our schools are also properly equipped with the technology in the classroom. The process of teaching has also evolved with time, but the quality education remains as the main challenge in spite of inclusive expansion in the education sector. There are various unaddressed issues like skill gaps, shortage of skilled labor, unemployment, the digital divide in our country. Developed countries are already making use of technology in the learning and teaching process, making the technology as vital part of classroom teaching, but ICT integrated education is still a faraway dream in developing countries like India. As most of the Indian population lives in rural areas there are lots of challenges in the grass root level implementation of ICT integrated education. National policy on education 1986 was modified in 1992 to employ ICT to improve the quality of education. The policy statement led to two major centrally sponsored schemes to come in place, namely ET (Educational Technology) and CLASS (Computer Literacy and Studies in Schools). The National Curriculum for School education (2000) recommended formulation of plans for integration of ICT in the schools and realized that successful implementation of ICT depends on the professional development of teachers. In 2005 NCERT brought out NCF (National Curriculum Framework) recommending the integration of ICT across the curriculum and also reiterated the importance of

professional development of teachers for its success. In 2012 National Policy on Information and Communication Technology (ICT) In School Education Department of School Education and Literacy Ministry of Human Resource Development, Government of India once again laid emphasis on Integration of ICT in education. In 2019 New Policy on Education was launched which focused on the availability of technology for easy access to information, and recommended technology integrated pedagogy must be used in teaching at all levels. Our research study focuses on government schools of District Rajouri of J&K Union Territory in India[12].

3. Problem

Making one person in every family digitally literate is one of the integral components of the Prime Minister's vision of digital India. The available digital platforms can be beneficial to every citizen of the country in every sphere of life, if used properly. Information and communication technology (ICT) have enabled education to evolve towards electronic participation, promoting inclusive online engagement, global exchange of information and easy access to information unreachable otherwise. Although the most of the secondary and senior secondary schools are equipped with ICT infrastructure, but its potential is either unutilized or underutilized, the main reason being the lack of digital literacy of teachers. People and students who lack digital literacy skills may soon find it difficult to gain access to information available online. This can be achieved by including digital literacy in secondary education[13]. Rising use of digital media in the society makes it inevitable need for digital literacy among students to succeed both in academic and professional life. Proper use of digital devices, desktops, laptops, smart phones among the people, especially student community is the basic step towards digital literacy. The teachers and students must be confident in their digital skills so that can meet the challenges of the evolving digital environment and economy. Digital literacy enhances education by empowering teachers and students to use digital tools and resources to attain educational objectives[14, 21]. Educators must be digitally literate to help students in participation towards bridging of digital skills gap in the modern digital age and create agile learning environment. Digitally literate teachers and instructors must foster creativity by making education more collaborative and enhance problem solving capabilities and communication skills of the students[15].

ICT infrastructure has been established in all higher secondary and most of the High schools of District Rajouri (J&K), 53 schools are equipped with ICT labs and 23 schools have CAL (Computer Aided Learning) facilities but the potential has not been harnessed because of various factors. The primary factor being lack of digital literacy skills among teachers. The under-utilization of available ICT facilities in the schools, because of the reluctance of its usage by teachers erupts one of the bottlenecks towards integration of ICT in education. Therefore, the focus of the paper is to study the factors influencing the use of ICT in government schools of Rajouri.

3.1. Objectives

Technology integrated education has changed the role of the teacher from a passive transmitter of knowledge to mentor, co-learner and guide towards discovery of knowledge in a student centric learning environment[16]. Teachers now have access to professional content for instruction, multiple quality resources and ICT systems designed to attain the educational outcome and increase self-learning in students. This role change of teachers demanded him to display a different set of skills not relevant in the past. He must be properly equipped with new skills, attitudes and knowledge required for handling ICT in the classroom[17]. In a fast changing environment, teachers often find it difficult to cope with new changes in the teaching process that includes digital delivery of educational context[18]. They must have good data analysis skills to browse multiple sources of reliable data, create useful instructional material out of it to suit the student's age group, level of understanding and learning needs Mere teaching using ICT tools in a passive manner will not fulfill the purpose of ICT as pedagogical tool for learning; rather use of ICT as pedagogical tool must be emphasized to enhance teaching learning process[19].

- Modern teacher must have proficient ICT skills to be confident to integrate ICT in pedagogy across the curriculum and in teaching of all the subjects to enhance quality of teaching learning process.
- The teacher must plan how to use the technology in instruction and select the suitable method to do so, for that purpose he must keep on trying new methods and resources to discover what suits for him and his students.
- He must aid his colleagues and ICT coordinators in using ICT by sharing the content and knowledge of ICT with them
- He must update his knowledge to keep pace with the global knowledge and make use of technology to create content for instruction that can be shared, reused by other teachers as well.
- The teacher must possess high cognition skills and with the support of technology, act as a skilled educator to promote constructivism.
- The teacher must be able to differentiate between reliable and unreliable sources of information available on the internet.
- The teacher should make creative use of information available on line in applications or projects on which the students work.

- Teachers must be able to make students aware about cyber bullying and help prevent abusive behavior on the internet.
- Teachers must make students understand about digital footprints a person leaves while sharing and browsing online [22].
- Teachers must make student aware about the basics of protecting themselves online, internet safety, creating strong passwords, using privacy settings, protection from hacking, spam, spoofing, etc[20].
- Teachers should know about creative ways to teach digital citizenship.
- Teachers must make students understand about the ethical use of information available online, plagiarism, copyright issues and proper way to reference information.
- Teachers must help students and inspire them in using familiar social platforms and other applications for collaboration and communication.
- Teachers should make use of visual learning aids to make complex topics easy to understand and assimilate by school students.
- Teachers should use online learning to supplement classroom learning by providing a customized experience for each student by targeting their individual needs.
- Teachers can make use of ICT for the remedial teaching, enabling slow learners to learn at their own pace [6].
- Teachers can help bridge digital divide between children and teachers in schools[17].

4. Methodology

Data was collected from schools of Rajouri district. % were rural and % schools are in urban areas. Data collection procedure included the use of questionnaires consisting of close ended multiple questions through which respondents were asked for their experience encountering the use of ICT in the teaching process at their schools. The questionnaire for teachers consists of questions that helped to understand their attitudes and perspectives on the use of ICT. Questions included qualifications of teachers, their age key group they are teaching and some questions to check their digital competency levels with the uses of various ICT tools and technology platforms. This helped to assess the impact of various factors in the use of ICT in education. Another procedure for data collection included scheduled visits to various secondary and senior secondary schools to assess ICT infrastructure. We also visited ICT based classes to understand the use of technology in classrooms. We also conducted face to face interaction with teachers based on semi structured questions to understand the problems they are facing in the use of ICT in the teaching process. There are about one thousand and five hundred schools in the Rajouri district of Jammu and Kashmir and the selection of schools was made based on the availability of ICT facilities. The selection of samples is critically done to ensure the correct assessment and attitude of the digital literacy among the teachers. Those schools having ICT facility are visited and the evaluation was made with the help of a questionnaire and interaction as well. Some of the schools having the non-availability of ICT facility are also visited and an assessment was made accordingly.

4.1. Data analysis

All the data collected was organized, cleaned and then analyzed properly. Results generated were presented in frequencies and percentages of occurrences in the tables. The data were then graphically represented in the form of graphs and charts to illustrate relationships between various data elements.

5. Observations

5.1. Teachers view about digital literacy (See Fig.1.)

More than 70 % of the teachers consider digital literacy as a very important skill in teaching and are aware about its benefits in teaching process, but their lack of competency prevents them in using ICT in teaching their students.
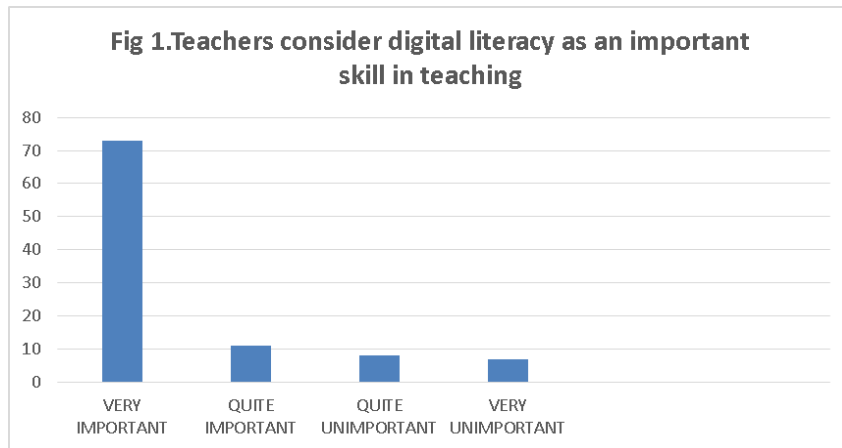
Fig.1. Teachers consider digital literacy as an important skill in teaching

5.2. Teacher's undergone training in ICT (See Fig.2.)

Analysis showed that the percentage of teachers trained in ICT is less than 10%. Teachers are not competent to use ICT in the classroom and lack skills for ICT integration in teaching process. Most of the teachers are not able to use even simple ICT applications and tools. The results clearly indicate the need for professional development with respect to ICT for successful ICT integration in schools.
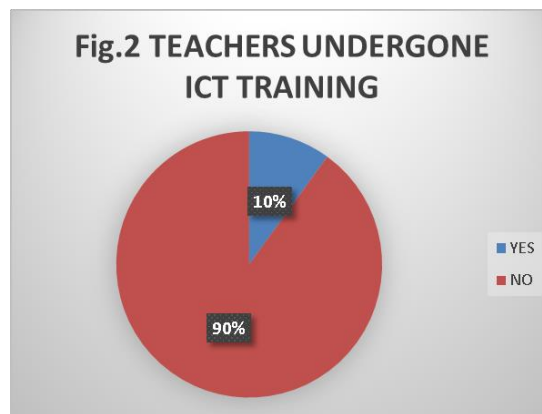
Fig.2. Teachers undergone ICT training

5.3. Teachers having a PC and Internet access (See Fig.3.)

30-35 % of teachers have personal computers at home and 70-80% have Internet access available.
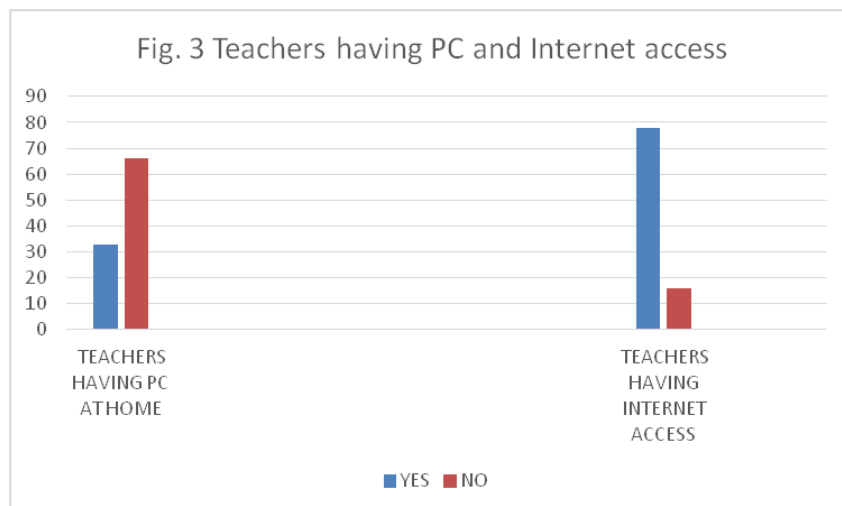
Fig.3. Teachers having PC and Internet access

5.4. Teachers using various ICT tools in teaching (See Fig.4.)

About 58-80 % teachers didn't use any ICT tool in teaching his students, only 10-15 % teachers ever used ICT tools like smart boards and PowerPoint presentations on teaching. Only 20-30 % teacher's use online resources in teaching and 15-20% teachers can create their e-content.
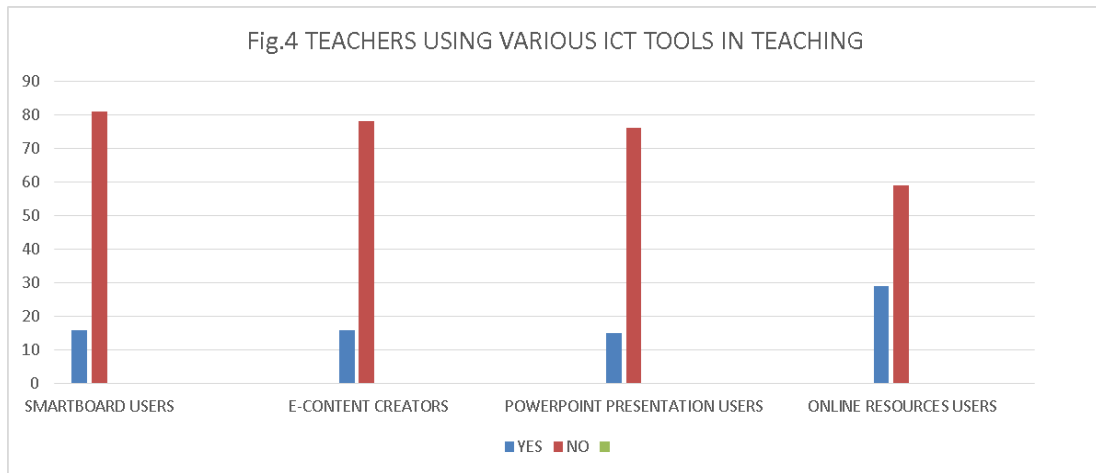
Fig.4. Teachers using various ICT tools in teaching

5.5. Online learning platforms used by teachers (See Fig.5.)

About 80-90% teachers reported they have never used any online platform for learning or updating their knowledge. Only a small percentage, i.e. 0-10% teachers have used SWAYAM, MOOCS, NPTEL, NCERT tutorials or any other platforms.
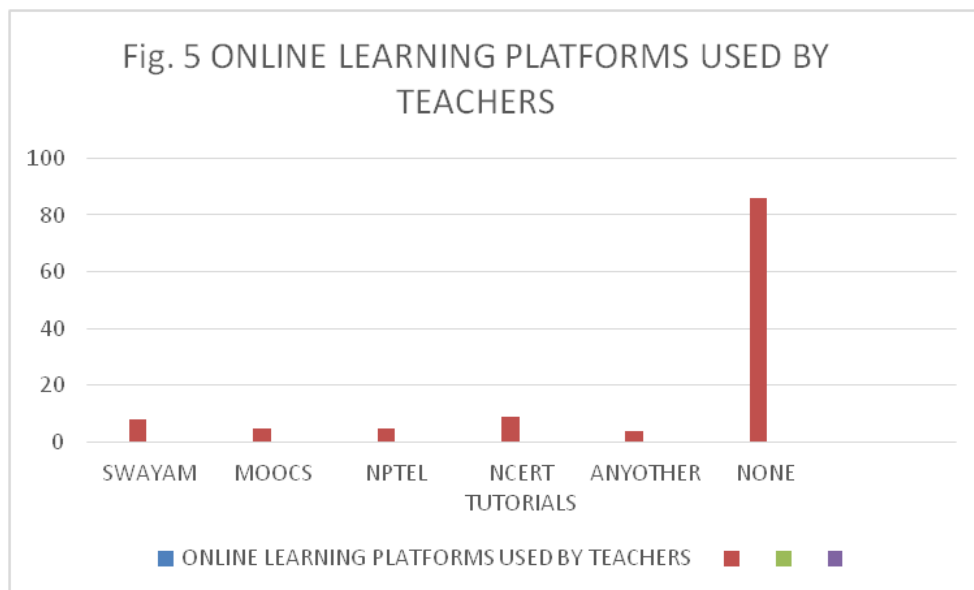
Fig.5. Online learning platforms used by teachers

5.6. Teachers' use of search engines as sources of information (See Fig.6.)

The 50% teachers cannot use search engines to easily search for information. 10-20 % teachers can use search engines to easily search for required information. 20-30% of teachers can differentiate between reliable and unreliable sources of information, rest 60-70% of teachers are unable to differentiate between unreliable and reliable sources of information.
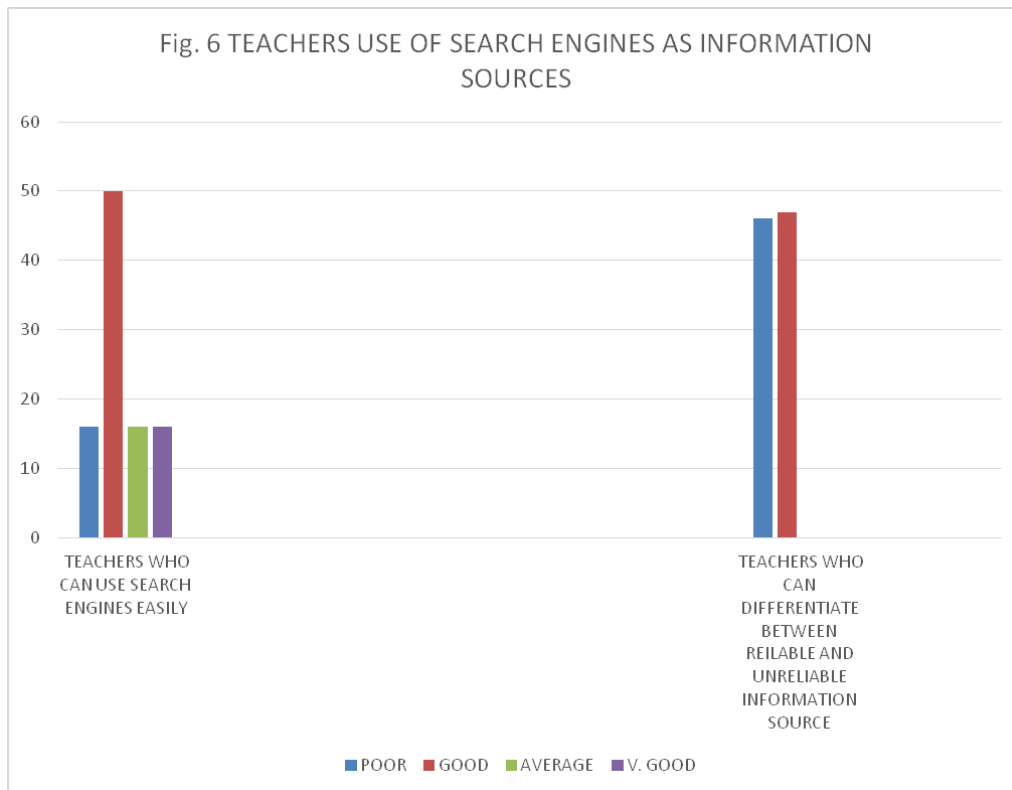
Fig.6. Teachers use of search engines as information sources

5.7. ICT Infrastructure in schools (See Fig.7.)

Almost 60 % of the secondary and sr. secondary schools have basic ICT infrastructure and facilities for use of ICT tools, 40 % of the secondary schools lack basic ICT infrastructure.
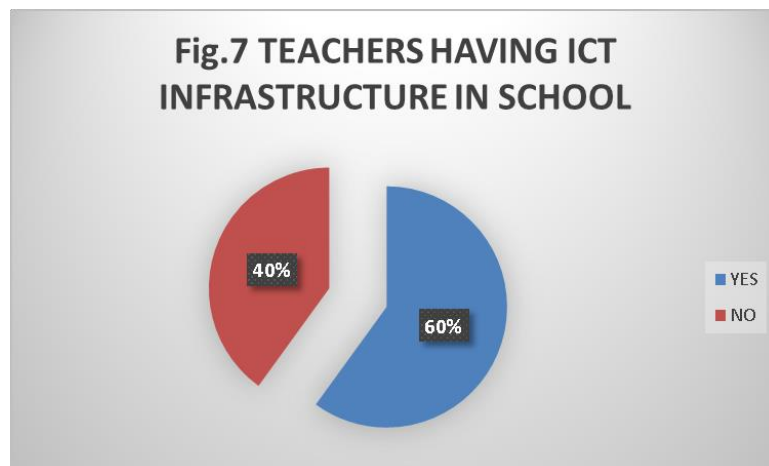

Fig.7. Teachers having ICT infrastructure in school

5.8. Internet access in schools (See Fig.8.)

With the reduction in bandwidth costs and availability of high speed internet, Internet facility has been made available widely in schools also. Almost 60-70 % schools have reported access to Internet.
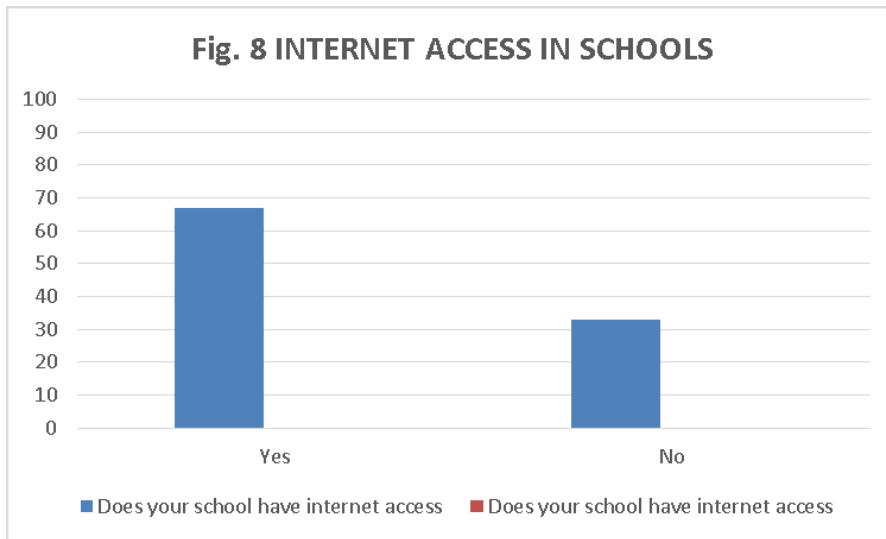
Fig.8. Internet access in schools

5.9. ICT tools used by teachers in teaching (See Fig.9.).

While assessing digital competency of teachers, it was reported that 60 % of teachers use social networking in their everyday life, 80-90% teachers use instant messaging applications,70-80% use YouTube and 40-50% make use of search engines. Only a small percentage of teachers 5-10% make use of Wikipedia, email, MS office, Presentation software and videoconferencing applications.
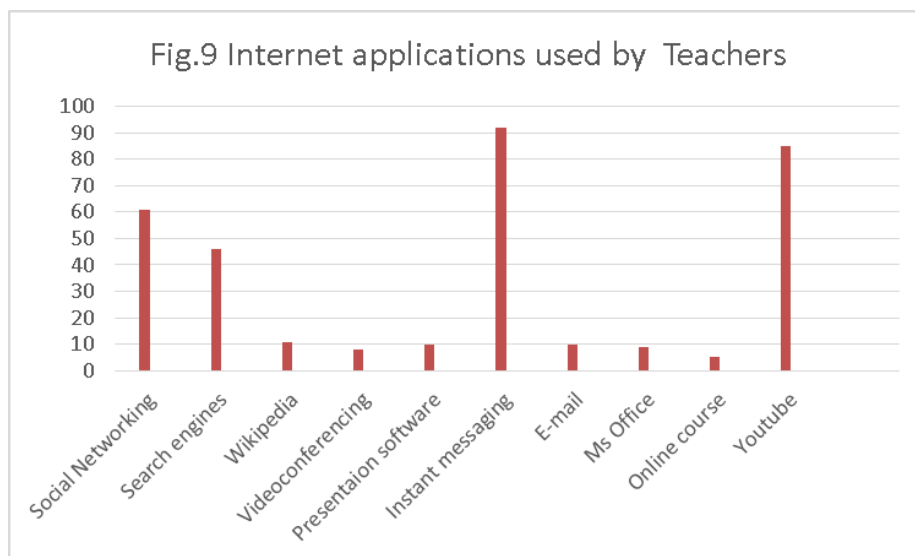

Fig.9. Internet applications used by teachers

5.10. Confidence of teachers using ICT in teaching (See Fig.10.)

The 65% of teachers are completely unconfident while using ICT in classrooms as they lack competency and skills in handling ICT equipment. 15% teachers were somewhat confident in using ICT, only 10-15 % of teachers showed some confidence in using ICT while teaching their students.
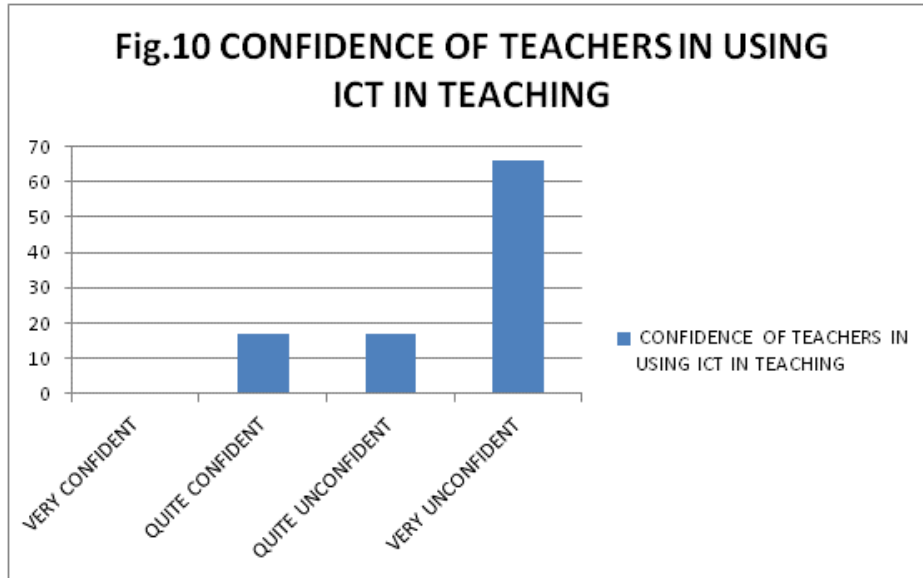
Fig.10. Confidence of teachers in using ICT in teaching

5.11. Need of training felt by teachers (See Fig.11.)

Most of the teachers 94 % were of the opinion that they need ICT training to support the use of ICT in teaching.
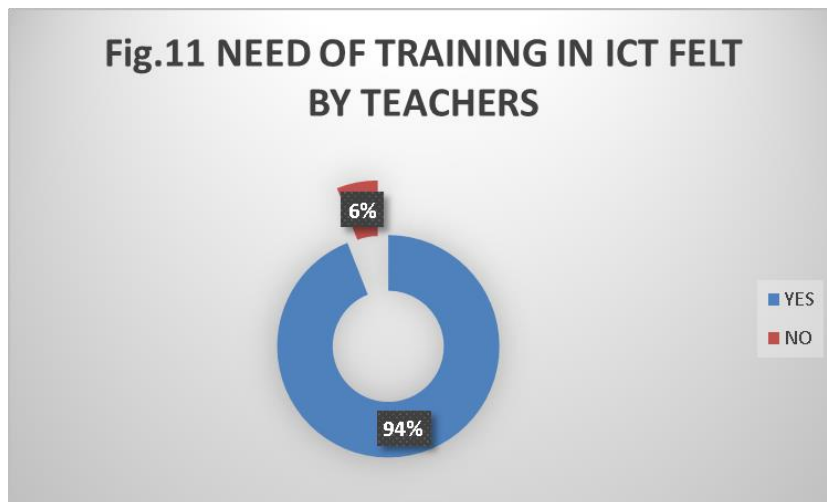

Fig.11. Need of training in ICT felt by teachers

5.12. Need for revised curriculum felt by teachers (See Fig.12.)

Most of the teacher's 83% felt that existing curriculum is obsolete and doesn't directly support ICT integration and recommended that curriculum should be revised to support ICT integration.
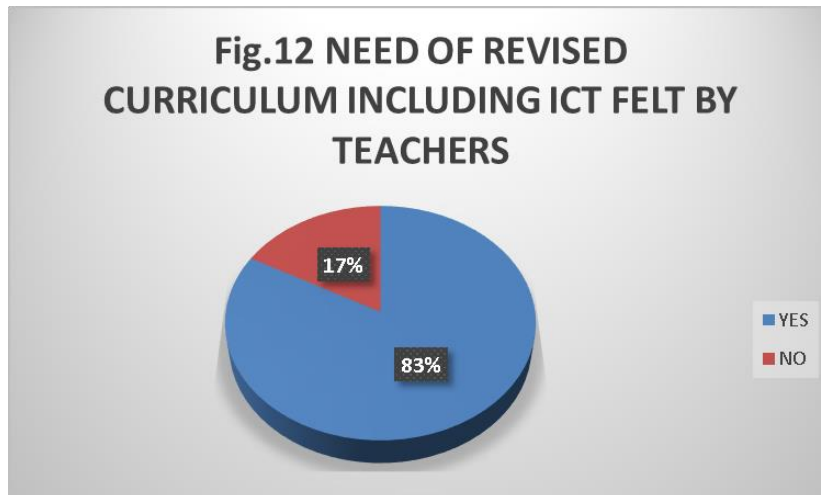
Fig.12. Need of revised curriculum including ICT felt by teachers

5.13. Teachers Using ICT in teaching (See Fig.13.)

Results show that 68% teachers never used ICT to support teaching, 17% used ICT at least once in a year,3% teachers use ICT at least once a month in their teaching process.
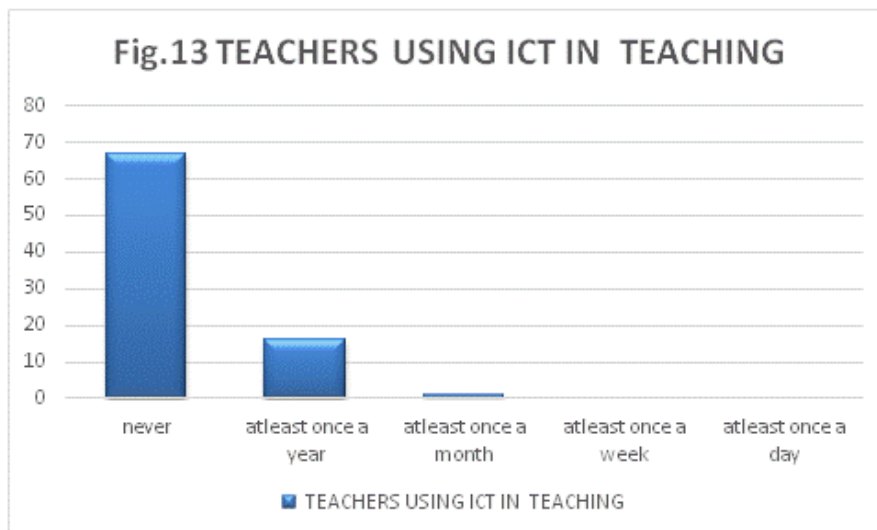

Fig.13. Teachers using ICT in teaching

5.14. Factors affecting use of ICT in teaching (See Fig.14.)

Most of the teachers 60-70 % felt that lack of computer skills in teachers is a main blocking factor for the use of ICT in education. Teachers were reluctant to use ICT in classroom because of their inability to handle ICT equipment with confidence. They feel embarrassed in front of students if they commit mistakes while using ICT. Some teachers 22 % considered lack of ICT infrastructure as a limitation in integration of ICT. Very small percentage considered other factors like lack of internet access, lack of time or lack of student interest as limitations in ICT integration in schools.
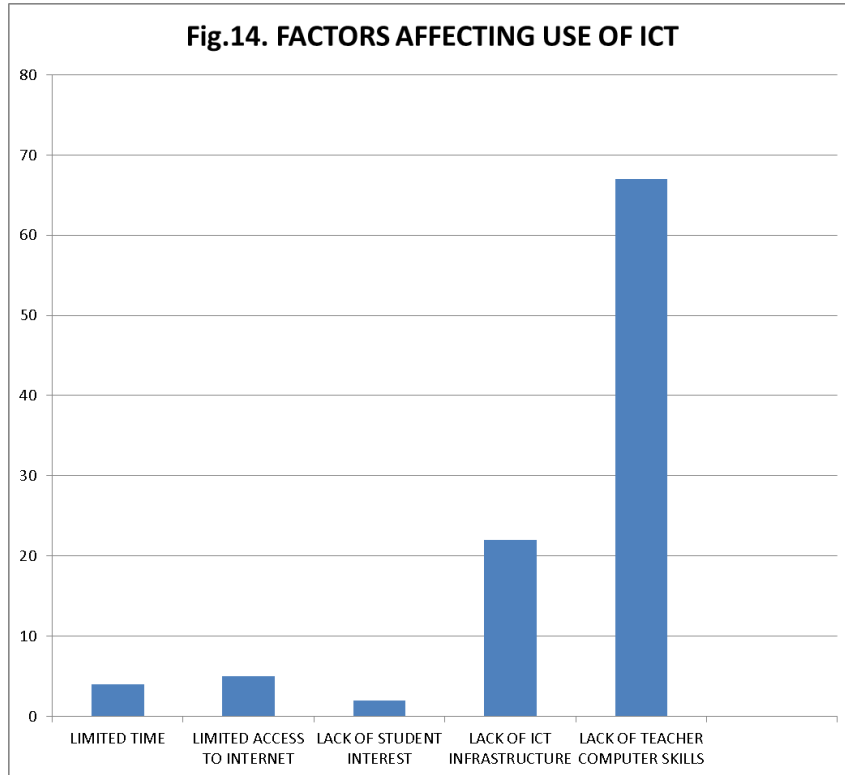
Fig.14. Factors affecting use of ICT

5.15. *Perspective of teachers about ICT (See Fig.15.)*

While studying the perspectives of teachers about ICT integration in teaching, almost 50 % teachers indicated need for training in ICT training for practical implementation of ICT in education. Some teachers less than 10 % were already comfortable and enjoyed use of ICT in teaching, small percentage less than 5 % felt that they don't require ICT in teaching of their subject.
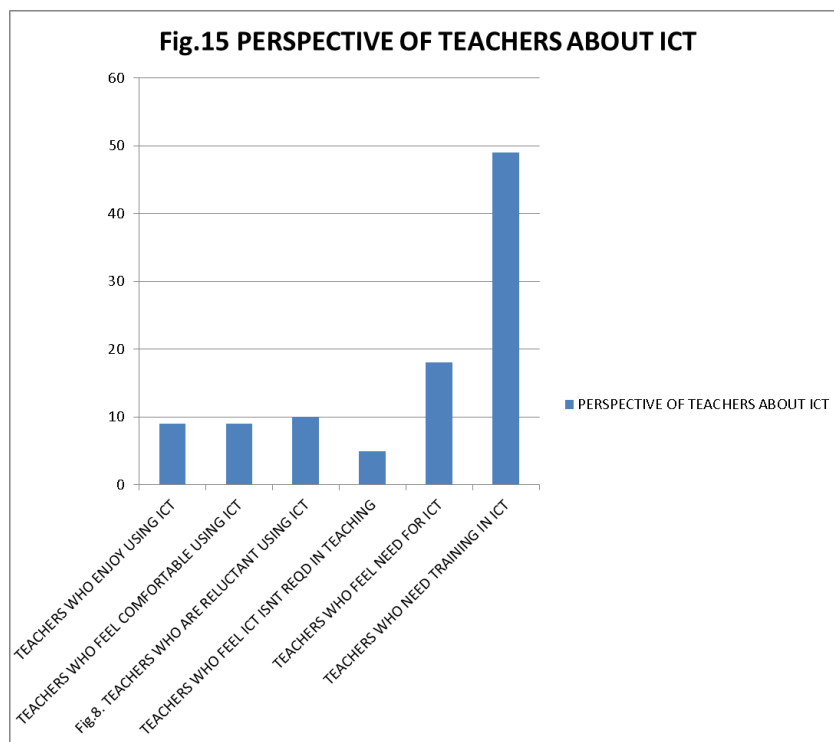

Fig.15. Perspective of teachers about ICT

6. Results and Discussions

The analysis of the survey and interaction is quantified with the help of appropriate graphs. The assessment of a teacher's knowledge about ICT tools, other digital platforms and social networking platforms showed that most of the teachers lack digital literacy skills and not familiar with modern day technology. The critical assessment of data indicates that in spite of existing basic ICT infrastructure made available in schools, Increased access to the Internet and availability of ICT tools in most of the schools ICT has not been integrated in teaching learning process the main reason being lack of competence of teachers in using ICT. This clearly indicates the need for professional development and training of the teachers to include ICT as an important component, so that they can successfully integrate ICT in teaching. Most of the teachers have joined the education sector before the era of technology and there were no computers in the schools at that time. They have either little or no expertise in ICT and lack awareness about the use of ICT. They must be provided ICT trainings so that they acquire the required skills and sense importance about the use of ICT in teaching. Newly recruited teachers must be given awareness about the use of ICT in the classroom in induction programs and there must be an integral part of professional development of teachers. Some other factors influencing use of ICT in schools are lack of administrative policies, lack of motivation by Head of Institutes or school management and the need for curriculum revision to support the use of ICT.

7. Recommendations

a) Producing digitally competent teachers by directly addressing the issue of teaching ICT in teacher education.
b) Continuous professional development of teachers with special emphasis on ICT skills.
c) Inclusion of ICT in Pre service Teacher Education (PSTE), ISTE (In-Service Teacher Education) and teacher induction programs.
d) Motivation of teachers to include ICT pedagogy for effective teaching.
e) Awareness of teachers about the benefits of using ICT in education.
f) Need for technical support in schools to create, share, reuse and deliver e-content
g) Need of revision of curriculum to support ICT integration. This can be done by including ICT as a separate subject or by using ICT for teaching across the subjects. For use ICT across the curriculum the existing curriculum must be revised and redesigned to include ICT integration.
h) Facilitating access to ICT resources by school management or Head of Institutions.
i) Co-operation from all stakeholders, community and policy makers.
j) Timely conduct of ICT trainings and workshops to upgrade the ICT skills of teachers with new tools and technologies [7].
k) Identification of teachers lacking digital skills and ensure their participation in ICT trainings
l) Setting up of standards to include ICT skills as criteria for selection of teacher candidates.
m) Use of technology in administrative activities as well as admissions, assessment etc.

8. Conclusion

From the survey and assessment of digital literacy attitude among the teachers of schools in Rajouri district of Jammu and Kashmir, it is evident that the need of training and motivation is must. The un-utilization of ICT resources indicates the reluctance of teachers in using it. Therefore, keeping in view the necessity and exploration of digital literacy, it is recommended that adequate methods for training the trainers (Teachers) needs to be initiated and executed accordingly. The study carried out indicates the quantum of ICT approach among the teachers of District Rajouri (J&K) and the results obtained show low acceptance of ICT integrated teaching by teachers. The main reason being the lack of ICT skills in teachers and to mitigate it the appropriate training to the teachers with emphasis on the development of ICT skills is required.

Acknowledgements

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