

Computer Based Functional Literacy in ICT among Teachers and their Epistemological Understanding

Shraddha Dwivedi

M. Phil. Scholar

Babasaheb Bhimrao Ambedkar University, Lucknow, India

Abstract— The rapid growth of ICT enables the teachers more affordable in learning that satisfies their professional growth. The implementation of ICT in schools by teachers is in the forefront of education reforms locally, regionally, nationally and internationally. The development of economy and education at global level is based on the education system of that nation, where ICT plays very important role. U.S.A., Japan, Finland and other countries believe that the development of education system is based on ICT. Currently, the development of ICT has led to a widespread attention of using ICT to advance the educational goals. This is in part driven by the belief that ICT can play an important role in adapting the approaches from traditional to constructive and the shaping of education. Recent developments across the world have moved from the mind set of using ICT as a teaching and learning aid, but of shaping the delivery of contents and bringing about the changes in education from education in the industrial society to education in the information society. The effective use of ICT may be the key reason in the intellectual growth of teachers along with schools. Teachers, using ICT in teaching make their class more constructive and learners' learning-oriented. In the age of digitalization, most of the teachers remain untouched from the ICT devices in the Indian context. Despite having 6.5% computer literacy, India is the second largest internet user. Besides these the computer based functional literacy rate among teachers is very low. There are not only several possibilities in improving the quality of education by the use of ICT but also many challenges in achieving the goal of the education in Indian education system. For making the education more innovative and more constructive, the understanding about the implementation of ICT devices is very essential. To support traditional teaching method there are several ICT based pedagogical tools. What are the beliefs (personal conception), regarding the use of those ICT based pedagogical tools? The personal conception about the use of ICT is the personal epistemology (Epistemological Understanding) of the teachers. Teaching with ICT, teachers' beliefs about knowledge and knowing (epistemic beliefs or personal epistemology) for ICT use may play an important role in the classrooms, which is the part of computer based functional literacy. Several variables affect ICT understanding among teachers. The scrappy growth of information and communication technology (ICT) has created a huge challenge for education. Like other developing countries India is also facing some challenges regarding the use of ICT by teachers. Several teaching aids make the classroom very effective and productive but the success of ICT implementation depends on related challenges. Identification of the challenges can help in improving the teaching and learning outcomes. This paper made a sincere effort to comprehend the epistemological understanding (epistemic beliefs) of ICT among teachers.

This paper also throws the light upon the possibilities and challenges regarding the use of ICT in Indian education system.

Keywords: Computer Based Functional Literacy; Epistemic Beliefs; Epistemological Understanding

I. INTRODUCTION

In the phase of literacy, the connections of literacy with productive activity, work or economic and social development were sought to be established; this phase was also known as the phase of functional literacy. Functional literacy more popularly known as Adult literacy that could not be an end in itself; it should be regarded as a way of preparing a person for the social, cultural, political, educational and economic participation. These roles even extend beyond the levels of rudimentary literacy. It was felt that literacy could create an opportunity for attaining information and generating awareness that can be immediately made use of to improve the living standards of the individuals. Teachers are making use of the computer based functional literacy to enhance their knowledge and generate productivity. The main benefits of the computer based functional literacy (CBFL) for teachers is to provide training for work, increased productivity, a larger participation in the knowledge building, a better understanding of the environmental conditions and opening of the way to cultures, beliefs, norms and ethics (Bhatia, 2013). As the rapid growth of ICT enables the teachers more affordable in learning that satisfies their professional growth. The implementation of ICT in schools by teachers is in the forefront of education reforms locally, regionally, nationally and internationally. The development of economy and education at global level is based on the education system of that nation, where ICT plays very important role. U.S.A., Japan, Finland and other countries believe that the development of education system is based on ICT. Currently, the development of ICT has led to a widespread attention of using ICT to advance the educational goals. This is in part driven by the belief that ICT can play an important role in adapting the approaches from traditional to constructive and the shaping of education. Recent developments across the world have moved from the mind set of using ICT as a teaching and learning aid, but of shaping the delivery of contents and bringing about the changes in education from education in the industrial society to education in the information society. The effective use of ICT may be the key reason in the intellectual growth of teachers along with schools. Teachers, using ICT in teaching make their class more constructive and learners' learning-oriented. In the age of digitalization, most of the teachers remain untouched from the ICT devices in the Indian context. Despite having 6.5% computer literacy, India is the second largest internet user. Besides these the computer

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II. FUNCTIONAL LITERACY

The meaning of functional literacy can be understood by three perspectives—the first one is, it provides the ability to communicate with others at the critical thinking level. The second perspective is it provides the ability to enhance the quality of life in various aspects such as vocational skills, life skills, ethics and morality and so on. Another perspective is it makes a person able to learn other subject areas and recognizing the significance of life-long learning.

The term Functional literacy was first defined for UNESCO by William S. Gray (1956) in his survey of reading and writing. A person is functionally literate when he has attained the knowledge and skills in reading and writing, which permits him to get involved in all those activities in which literacy is usually expected in his culture or group. This definition, as can be seen, is relativistic, for it sets the variable standard of literacy in different societies. So what should be termed as functional literacy in a democratic society is possibly that skill which leads to the voluntary participation of the individuals in the social and democratic processes. The concept of literacy and certainly many UNESCO development programs have been meaningfully influenced by the writings on social change and development.

III. COMPUTER LITERACY

A kind of literacy in which a person may be able to operate the computer sincerely, he or she can use different function keys

of the computer, can give the command to the computer and complete the given task in an effective way. A person with at least basic knowledge of computers may call computer literate. People with disabilities in using information communication technology often encounter by using technologies.

IV. EPISTEMOLOGICAL UNDERSTANDING OR EPISTEMIC BELIEFS

The study of knowledge and knowing is primarily concerned in epistemology. There are several researches conducted regarding the relationship between teachers and their beliefs about teaching and learning, preferably in field of knowledge and knowing. These beliefs may develop from various aspects of teaching and learning, such as teachers' beliefs about use of ICT in classroom practices. These beliefs are derived from epistemology. Epistemology is the philosophical study of knowledge, and what knowledge means for someone to know something. Middlemost of the field of epistemology are related to the nature of truth, the nature of development, and types of knowledge, e.g., knowing how (skills) or knowing that (facts). Whatever, as stated by Siegel, (1998), knowledge is, "it is uncontroversial, pre-philosophically, that education aims at the imparting of knowledge: students are educated in part so that they may come to know something about things". Thus the study of such personal conceptions of knowledge is commonly referred to as personal epistemology or epistemic beliefs. Students' personal epistemological beliefs about the nature of knowledge influence his/her learning outcomes and performance. In the context of Psychology and education, personal epistemology beliefs are "how individuals come to know, something and beliefs they hold about knowing, and the manner in which such epistemological premises influence the cognitive processes of thinking and reasoning.

V. COMPUTER BASED FUNCTIONAL LITERACY (CBFL)

Illiteracy and poverty are the two sides of a single coin. An illiterate person has less privileged and most probably they don't know about their rights. Illiteracy leads to poverty and poverty leads to a high dropout rate in India. In the present scenario, there is no area that remains untouched from ICT. In the Indian context, there is a huge population using the internet and other ICT devices. But the in-school environment, the least number of teachers use ICT devices to make their classes more constructive and innovative. Most of the teachers are using the internet and/ or ICT devices in daily life routine but afraid of using information communication technologies in classroom practices. What may be the reason behind this kind of mindset? Maybe they need training programs to enhance their knowledge regarding ICT or maybe teachers face a lack of ICT environment in schools. In the present existence, in India, there are number of individuals who are unable to read and write, there is lack of awareness amongst them, they are residing in the conditions of poverty and backwardness, they do not have employment opportunities, they are unable to sustain their living conditions and, in some cases get involved in social problems, such as, criminal and violent

acts. These are hindrances within the course of social life development. Teachers also have a lack of CBFL. Therefore, to alleviate these problems and in making provision of assistance to them to enhance their knowledge and productivity, it is important to recognize the different training programs concerning functional literacy. There is a list of various training programs held by e-government such as- National Adult Education Program, National Literacy Mission, Saakshar Bharat Mission, Functional Literacy for Adult Women, Farmer's Functional Literacy Project, Rural Functional Literacy Program.

VI. EPISTEMOLOGICAL UNDERSTANDING OF TEACHERS AND CBFL

Sometimes we face some problems in daily routine life and there are several solutions before us. What happens next? Will we accept all kind of solutions regarding particular problems? The answer may be no. We further seek the solution of a particular problem based on our own understanding of that. In the case of academic problems where we go for the solution? We go to several authorities like parents, relatives, neighbors, friends, peer groups and so on. We examine various books, look for several websites, and search for information online. In this way, we construct knowledge about a particular topic for which we were unfamiliar previously. What may be the reason to trust in new terms or new knowledge? How will you evaluate or justify that the new knowledge is trustworthy? Would you believe in the fact that you read or hear? Which kind of authority will you accept/ believe? How did you identify which kinds of ICT devices are useful in teaching? How certain are you about the information that receives, is true and useful in classroom teaching? As a teacher, how will you concatenate your previous knowledge or experiences with online authorities? Many of the teachers know about the internet, use different ICT devices in daily life but how many teachers use ICT as a tool in their classroom teaching? How many teachers make their classes more constructive and productive with the help of ICT? Questions regarding the use of ICT in classrooms are related to computer-based functional literacy. These questions may consider as a sample, influenced by a person's personal conceptualization for knowledge and knowing (Hofer, 2004). That may also consider as personal epistemology or epistemological understanding of computer-based functional literacy (CBFL) in ICT among teachers. Most of the teachers use computers searching for additional knowledge. They keep learning about a new topic through online searching. Online searching may use in a routine manner in which a person gathers knowledge in the process of constructing their epistemological understanding of a new topic (Hofer, 2004). Teachers use ICT for their personal need but what they think about the use of different ICT based pedagogical tools in their classrooms? Teachers' beliefs may play a vital role in an ICT rich classroom environment. Teachers' characters, attitudes, age, way of teaching, teaching experiences and also the experience with computers may influence adopting innovations in the classroom and thus enhance learning outcomes (Sharina Mou, 2016). Teachers' beliefs about the use of computers and their knowledge have a direct impact

on his/her teaching style. That may help in creating a resourceful and constructive classroom environment with high productivity. Here, the findings of Hofer (2004) indicate how a person interacts with dimensions of epistemic beliefs, based on online searching. Teachers do epistemic judgment for their classroom strategies and this judgment is carried out by the epistemological nature of learning. During the use of ICT teachers first search content and way of teaching, a part of epistemic approach. There are several evidences for epistemic thinking in five dimensions of epistemic beliefs. Out of five dimensions, certainty of knowledge and structure of knowledge are hard to recognize while control of knowledge, source of knowledge and development of knowledge would be more easily recognize in the process of functional literacy (coming to know something new). Teachers, who are using ICT devices as pedagogical beliefs, think in various aspects knowledge and create, own perception like "I trust this device because it's used most frequently in other educational institutes". During computer based functional literacy training most of the teachers believes on various authorities (expertise). Previous findings also indicate that, during online searching or using internet, teachers activated their epistemic knowledge at various points and not only they search books, journals, news and different web sites but also they judge initially what the sources are relevant and reliable, Hofer (2004).

VII. RELATIONSHIP BETWEEN EPISTEMIC BELIEFS, PEDAGOGICAL BELIEFS REGARDING ICT

ICT devices can be used as pedagogical tools for different teaching approaches. Application software (like spreadsheets) can be used as cognitive tools under the constructive approach of teaching (Deng, et. al, 2014). Findings of Ertmer (2005) indicate that the way of using ICT is influenced by teachers' beliefs. Findings also indicate that teachers are using ICT in the support of both approaches traditional as well as constructivistic. Teachers are also using the computers as cognitive tools o support their construction of students' beliefs. Teaching with ICT, teachers' beliefs, his/her pedagogical beliefs and their preference to use of ICT are closely related.

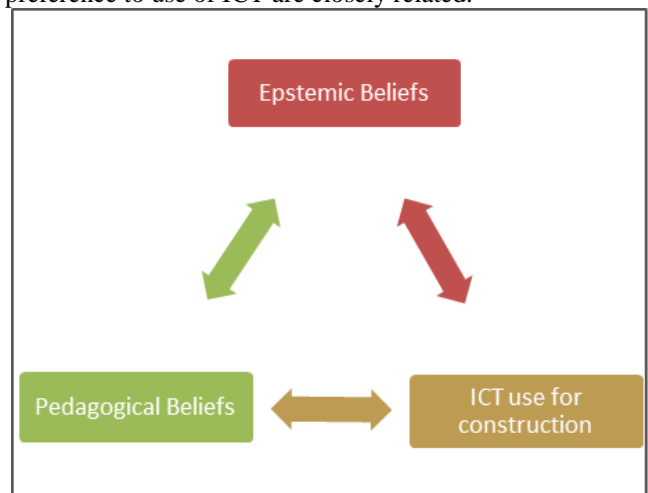


Fig. 1: A hypothesized framework for the relationships among epistemic beliefs, pedagogical beliefs and ICT use for instruction (Deng et. al, 2014)

VIII. POSSIBILITIES AND CHALLENGES IN THE FIELD OF CBFL FOR TEACHERS

CBFL is one of the most important parts of developing the education system of India. The importance of ICT in education is now clear. To increase the graph of CBFL various training programs are running and some initiatives have been taken, but these initiatives are not sufficient. Teachers face various problems in Indian educational culture. There are some challenges (Tondeur et. al, 2016) that must be addressed such as:

- Lack of sufficient equipment
- Lack of infrastructure
- Language problem
- Insufficient funds
- Teachers' beliefs
- Contextualization with sociocultural awareness
- Empowering pedagogy through ICT

Besides these challenges there are some possibilities in having computer based functional literacy (CBFL) that would be subsidiary in achieving the high yielding target in the classrooms such as:

- In developing effective leadership
- In changing the school and classroom environment
- Self-satisfaction
- In strengthening own beliefs regarding teaching and learning

IX. CONCLUSION

Education is the backbone of a nation and ICT in education is important to improve the teaching-learning process. It helps in building interactive relationships between teachers and students and to make the overall teaching-learning process more effective and enjoyable. However, we need to remember that integrating ICT in education is not only about using computers or having Internet connections but also using the technology appropriately in pedagogy and in a meaningful way. For those teachers, students, policy-makers, and all other stakeholders need to know about the urgency of using technology and how it could be used to change our traditional teaching methods. Teacher training should get more emphasis to read each and every teacher for next-generation education. Moreover, a vision is very much needed to focus on what we really want to achieve by integrating ICT into education; otherwise, the effort will not be succeeded.

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