

Role of Teachers' Attitude and Beliefs regarding use of ICT in Indian Classrooms

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ABSTRACT

The aim of this research is to understand the relationship between attitude and beliefs of Indian school teachers towards ICT and ICT usages in the Indian classroom. Sample consists of one hundred and twenty school teachers working in secondary schools of North India. Survey method was used to collect quantitative data. Findings were supported by semi-structured interviews with the purpose of having a deep understanding of major beliefs and motivations of teachers in use of technology. The results revealed that attitude of Indian teachers towards the use of ICT is positive but the use of ICT in Indian classrooms is not sufficient. The major concerns and problems identified by this study in the use of ICT tools by teachers include limited modern and technological infrastructure, rigid time table and fixed curriculum, low technical support, lack of effective training, rigid curriculum and time table, lack of modern methods of evaluation, diploma oriented education and less competencies and motivation on part of teachers in use of ICT. Further, this research suggested that there are no gender differences in the use of ICT by teachers. The study points out the requirement of development of new ways of teacher training which can facilitate and encourage use of ICT effectively in Indian classrooms.

KEY WORDS: TEACHERS' ATTITUDE, TEACHERS' BELIEFS, USE OF ICT, INDIAN CLASSROOMS

INTRODUCTION

Information technologies provide the tools for creating, collecting, storing, using knowledge and for communication and collaboration (Kozma, 2003). Recent researcher also reported that teachers appreciate the role of ICT in

classrooms but they are continuously find obstacles in using these technologies into teaching learning process (Balanskat et al, 2006). Today, the importance of education and training in ICT for citizens with the necessary skills to access information and participate in transactions through these technologies is recognised by many

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countries (Kozma, 2008). Research conducted in countries with different culture reports that although there is increase in the availability of ICT tools in schools, there is an indication that teachers are not using ICT as expected (Aldunate and Mehlenbacher, 2010; NESTA, 2012; Nussbau, 2013).

Every country strives to make ICT as integral part of the curriculum but access to technology is not sufficient enough to ensure its efficient use. Despite the international context wherein the importance of ICT-related literacies is universally acknowledged and widely regarded as increasing (Blurton, 1999; Kozma, 2003), there is considerable variation among (and even within) countries with regard to explicit ICT curricula, resources, and teaching approaches, (Kozma, 2008; OECD, 2005; Sturman, and Sizmur, 2011). In addition to problems arising from the variety of approaches in which ICT curricula are conceptualized and delivered, there also arise queries about the nature of the role that teachers, schools and education systems play in supporting the development of ICT related education. Donnelly, (2010) reported that efficient use of ICT in class is a complicated process which needs institutional support and time (Baron and Harrari, 2005). As the incorporation of ICT in teaching learning situations is inevitable, beliefs and attitudes of teachers towards the efficient use of ICT is a central condition for its successful implementation (Ertmer, 2005; Eickelmann, 2011).

India is a emerging country with a big population and since its independence in 1947, education for all people has become the mission of different governments in India. In 2000 India was witnessed a significant development in the field of use of ICT and since then tremendous progress has been made in the field of education with regard to use of ICT tools. The Ministry of Education in India has view that use of ICT in schools would make education more interesting, scientific effective and understandable. During the past 15 years Government of India has spent good amount of money to integrate use of ICT in educational institutions. Various schemes were proposed by Indian government to ensure ICT facilities in all government supported educational institutions with priority to institutions in backward areas and institutions with underprivileged section of the country (MHRD, 2016). India also invested a large amount of money to give opportunities to the teachers to improve their knowledge and skills related to use of ICT tools in the classrooms (IT for Change, 2018).

It is recommended by the National ICT policy that the ICT implementation in school education use free and open technologies, including FOSS (Free and Open Source Software) and OER (Open Educational Resources). Although there is expansion in use of ICT in Indian schools, the research investigating about the

level of use of ICT in educational institution is relatively small. Several authors have emphasised on the possible benefits of information and communication technologies (ICT) for improving the quality of education in various countries. ICT is considered as a important tool for building knowledge societies (UNESCO, 2003) and, especially, as a tool in the school education which could help in reconstructing the educational processes and system leading to effective education for all people. A large number of researches emphasised on the need for use of ICT in teaching learning process. Murphy (1995) summarises that problem solving, social growth, independent work, peer teaching, and exploration are the learning outcomes that result from the use of technology in classroom. A research reported that computer-based instructions help people learn more in less time than traditional classroom teaching (Chaudhari, 2015).

Arthy and Gowrishankar, (2015) also concluded that technology can be used as good teaching-aids for example radio and television which not only make the teaching and learning process interesting but will also ensures more learning retention. In recent years various researches focused on the effect of the use of computers in teaching and learning processes (Kirkpatrick and Cuban, 1998; Blok, et al, 2002). Cope and Ward, (2002); Windschitl and Sahl, (2002) also concluded that perception, attitudes, opinions, and assessment of teachers' assumptions are the advantages of the use of ICT in education. Davis, Preston and Sahin, (2009) also reported that preservice teachers' education help them to integrate use of technology in teaching and learning. So teachers are considered as key agent in the effective integration of technology in teaching and learning (Zhao, Tan & Mishra 2001; Teo 2011a).

A good number of researches have been conducted on the importance of teachers' attitude towards the use of ICT and innovations in the education. Many researches show that teachers have positive attitudes about use of ICT (Cure and Ozdener, 2008; Foley & Ojeda, 2008; Karagiorgim & Charalambous, 2006). An early age was found to be a relevant factor for teachers with a positive attitude towards use of ICT (Shaunessy, 2007; Aduwa, 2008) as those in early age have relatively more teaching exposure and experience with ICT and thus feel more engaged and are more comfortable in using it as compared to their older counterparts (Hammond et al., 2008a). Thus, the importance of integrating ICT in teaching and teachers' competence in using technology usually results from formation of a new generation, the 'Net Generation' that is 'the digital natives', referring to young people born between 1982 and 1994 who grew up immersed in technology (Tapscott, 1998; Prensky, 2001a, 2001b; Oblinger & Oblinger, 2005).

Latest researches has been continuously focused on teachers' attitude towards use of ICT. Zhao, Tan and Mishra (2001) asserted that evidence suggests that of teachers' attitudes to be directly associated with use of computers in teaching learning situations. Student progress of learning with ICT will largely depends on teachers' attitudes, and whether they are willing to use technology in teaching (Teo, 2006). Appreciating teachers' attitudes towards use of ICT may result in an understanding of integration of technology and accepting and using technology in classroom. Researches that used data from a survey of 776 information and knowledge workers from a university of U.S., found that participants with negative computer attitudes had less skills in computer use and were less likely to accept and adapt technology than those who have positive attitudes (Harrison and Rainer, 1992).

Teachers' beliefs and attitudes are fundamentals to successful implementation and using ICT in schools (Badia et al., 2013; Erdogan, 2011; Ertmer, 2005; Kubiak, 2013; Kusano et al., 2013; Oye et al. 2014; Petko, 2012). A belief is the subjective knowledge of an individual that he considers true and important in context to a specific subject' and as connected an individual's past history, personal values and emotions (Petko, 2012). An attitude can be defined as a complex, multi-dimensional construct comprised to cognitive, affective, and conative components' (Zhang and Aikman, 2007) or as an individual's negative or positive feelings (evaluative affect) about attaining the target behavior' (Fishbein and Ajzen, 1975). Teacher's attitude and beliefs would therefore seem to be crucial with regard to innovations in schools, especially those that combine pedagogies and technology.

Many studies (Atkins & Vasu, 2000; Gbomita, 1997; Moore & Benbasat, 1991; Roblyer & Knezek, 2003; Sugar, Fine and Crawley, 2004) found that teacher's attitude or belief is an important human factor with a significant impact on computer adoption and implementation of technology in classroom. Bullock (2004) also pointed that, attitude of teachers is an important enabling/disabling factor in adoption of technology. Teachers' attitude towards use of computer is the main determinant for computer use in the classroom in future (Myers & Halpin, 2002). A research conducted on pre-service teachers found that there was a significant relationship between use and attitude towards computers (Khine, 2001). The finding were supported by Yuen and Ma (2001) who conducted a research on secondary teachers and found that ICT use in instruction lead to general usefulness, affective attitudes, behavioural control, and pedagogical use are significant in determining the use of ICT. Kumar and Kumar (2003) reported that most of the teachers had a belief that experience in use of ICT positively affects

attitudes towards computers. Jackson et al (2001) also revealed that as compared to males, female users hold more negative reactions towards computers and these differences may be a result of using computers in different ways. Research also shows that successful use of technology depends on attitudes of teachers in educational settings (Baylor and Ritchie, 2002; Albirini, 2006). Therefore, attitudes towards computers may play a crucial role in accepting and in the actual use of computers. Thus successful utilisation of technology in teaching learning process largely depends on teachers' attitudes towards ICT tools (Kluever, et al., 1994).

The above literature review maps the complex relationships among teachers' beliefs and attitude towards use of ICT. The reviewed studies do not exhibit the Indian context as most of the studies have been conducted on English, European and Chinese populations. Use of ICT in education is a growing concept in India and there is a need to study the attitude and beliefs of teachers towards use of ICT in the Indian settings. This study aims to investigate the attitudes and beliefs of secondary school teachers of India. The research questions of this study are as follows

MATERIAL AND METHODS

Research Questions: To study the attitudes and beliefs of Indian school teachers towards use of ICT in teaching and learning situations. To find the gender differences in ICT use. To find out the challenges faced by Indian school teachers in using ICT.

Sample: Sample consist of 150 teachers selected from government and private schools of North India. India has different kinds and levels of schools with reference to use of ICT which can be categorised into four types:

Level A schools: In this type of schools ICT is a distinct feature of their curricular activities. These schools have very good technological infrastructure. The academic plan of these schools is integrated with appropriate use of ICT in academic activities.

Level B schools: This category of schools have only one or two classrooms well-equipped with technology. In these schools there are also some computers in the regular classrooms for use of students and teachers during lessons. The use of ICT is partially included in the academic activities.

Level C schools: In these type of schools there is a well-equipped computer classroom but its use is not compulsory for all teachers. The use of ICT is not included in the academic plan.

Level D schools: The schools with very limited use of ICT in educational tasks. Infrastructure is limited to a computer without network. There no interest and motivation among the teachers for use of ICT.

In India most of government schools fall under level c and d but most good private schools come under level A and B. Teachers selected as sample ranging between 28 and 50 years of age and teaching experience ranges from 5 to 20 years. In this research teachers who are working at level A and level B schools were selected for this research.

Data Collection

A mixed method approach was used to collect the data obtained from the participants. A questionnaire was framed which is designed specifically to address research objectives with regard to teachers' attitude and beliefs towards use of ICT tools inschools in India. The questionnaire was divided into five sections comprising 80 items: personal data (5 items), use of ICT in teaching practice (20 items), attitude towards ICT (25 items), training experience and training needs (20 items), and school equipment (10 items). The questionnaire was based on a five-point Likert scale: 5 = always, 4 = often, 3 = sometimes, 2 = rarely and 1 = never. Quantitative data was supported by open ended semi structured interviews of 15 teachers, teachers were asked to reflect on their major motivational beliefs and attitude towards ICT. All permissions were requested and participants were assured of anonymity. It was guaranteed to the respondents that all information was only used for purpose of research and for statistical treatment. There was no conflict of interests as school teachers' participation was voluntary.

Data analysis

The data collected from participants was analysed using the Statistical Packages for the Social Sciences (SPSS). The analysis includes both descriptive and inferential analysis. Descriptive statistics were used to determine the mean, standard deviation, frequency and percentage. Inferential statistics (t-test) were also used to analyze the research findings and content analysis was used for the semi-structured interviews.

Quantitative data

1- Teachers' attitude and beliefs towards ICT

Quantitative data depicted a picture of attitude of Indian school teachers towards use of ICT. It was revealed from data that most of teachers are enthusiastic and motivated to use ICT tools inside the classroom because they consider that it is useful to seek students' involvement, improve the interaction with students and increase interest and academic performance of both teachers and students.

It is clear from Table 1 that among the total 150 teachers, 16 (10.6 %) have highly unfavorable attitude, 26 (17.3 %) have unfavorable attitude, 38 (25.3 %) have neutral attitude, 52 (34.6 %) have favorable attitude and 18 (12%) have highly favorable attitude towards using ICT in classroom. It is concluded that most of the teachers have favorable attitude towards ICT use.

2- Role of Gender

In order to find out the gender difference between teachers' attitude towards using new technology, t- test was applied on scores of male and female teachers and results are given in table 2.

Table 2 shows that male and female teachers do not differ significantly in their attitudes towards use of ICT in education. These results are supported by the research conducted by (Shapka, & Ferrari, 2003) who studied the computer attitude and outcomes from computer tasks, they also did not find any gender differences. Antonietti and Giorgetti (2006) also reported no gender differences in teachers' beliefs. Further, Rahimi, and Yadolahi, (2011) also discovered no gender differences in computer anxiety or in the teaching experiences. So, it was concluded that there is no effect of gender in use of ICT in education. But there are also some previous studies which are contradictory to these findings as they reported significant differences in computer attitudes by gender (e.g. Margolis & Fisher, 2002; Markauskaite, 2006). Other studies have emphasised that the masculine image in computer use has discouraged females to use technology and this has made them more anxious and less confident (Culley, 1988). This research found no significant relationship for a gender and computer

Table 1. Levels of teachers' attitude towards using ICT

Score range	Male	Female	Total	Percentage	Level
80-139	6	10	16	10.6	Highly Unfavorable
140-199	6	20	26	17.3	Unfavorable
200-259	8	30	38	25.3	Neutral
260-319	12	40	52	34.6	Favorable
320-379	8	10	18	12	Highly Favorable

Table 2. Gender differences in their attitudes towards use of ICT

Gender	N	Mean	SD	t-value
Male	40	244.5	79.8	0.29
Female	110	240.4	66.6	

attitudes as may be in new generation of teachers male and female both have same attitude for ICT use.

Qualitative data

Fifteen interviews were conducted to complement the quantitative information. All interview transcriptions were categorized into two dimensions:

1-Attitude and beliefs for ICT use and the extent to which these teachers use ICT in educational settings.

The study points out that participants have positive attitude and beliefs for ICT use as teaching tools. Teachers believe that pupils like to learn with computers. They are also keen on ICT use in teaching and learning.

“The use of ICT in process of teaching-learning adds significance to education, by improving the teaching effectiveness. It added a new dimension to learning. After the inception of ICT in schools, students found learning in a technology-enhanced environment more stimulating and engaging than in a traditional classroom environment”. (Teacher excerpt)

“ICT, motivates me towards learning. It is reliable and provides interactive learning experiences. It facilitates communication and promotes creativity.” (Teacher excerpt).

“ICT backed teaching is more used between Class I-X. In terms of subjects being taught, Math, Social Science, Science, English has digitized and visual content which is used for classroom teaching. But for higher classes, mostly the content is designed by the respective subject instructors”. (Teacher excerpt). The research suggests that though teachers have favourable attitude and beliefs towards ICT use in education, the use of ICT in Indian classroom is not sufficient.

The majority of private schools are well furnished with ICT infrastructure and have sufficient use of ICT in teaching but Indian government schools have relatively less ICT facilities. In government schools technology is widely used for communication with authorities, at administrative level for filling of e portals of teachers and students but is not used sufficiently in the classroom. The various purposes for which schools are making use of ICT include student attendance, enrolment, academic progress, payment of fee, salary transfer and teacher recruitment were found to be the most common activities related to school management for which schools use ICT. Some other activities cited by the

schools are – preparation and sharing of transport roster, library management, vehicle tracking and procurement.

The insufficient use of ICT in teaching in government schools may be attributed to factors like hesitation or lack of time to use ICT in classroom situations. Most of the times government teachers are busy in election and other duties like completion of the target of 100 percent enrolment in schools. They are also occupied in managing various schemes of government like managing mid-day meal, budgeting of funds etc. and they don't get sufficient time for preparing their presentations. On the other side private schools have much better infrastructure; favorable student teacher ratio and class size than the counterparts in government schools which is favorable for sufficient use of ICT.

2- Challenges in use of ICT in classroom

Various challenges were identified by the teachers in using ICT in classrooms. These challenges are categorized as follows:

- **Poor infrastructure and Less access to ICT resources-** The study specifies that low access to resources, is a difficult challenge that inhibit teachers from using new technologies into classrooms. Teachers were asked about the challenges they encountered when they use ICT tools in classrooms. Most teachers felt that practical implementation was difficult mainly due to the lack of ICT resources, inadequate institutional support, absence of maintenance staff in the school to support teachers, lack of time in class to use ICT or lack of motivation on part of teachers. The basic barriers in using ICT in teaching reported by Indian teachers are poor infrastructure, hardware hazards and lack of content related software.
- **Technical problems -**These were found to be another major barrier for teachers. These technical barriers included failing to connect to the Internet, printers not working, buffering of websites and teachers working on old and outdated computers.
- **Training Opportunities-** There were not enough training opportunities for teachers for using ICT in a classroom environment. Pre service and in service training in ICT is inadequate.

Rashtriya Madhyamik Shiksha Abhiyan (RMSA) of India included the Information and Communication Technology (ICT) as its important component. This programme was launched in 2004 and revised in 2010 to give opportunities to secondary stage students to improve ICT skills and make them learn through computer aided learning process. The scheme is a main reagent to bridge the digital divide of various socio- economic and other geographical barriers amongsts students. But in spite of

these schemes there are still various barriers in use of ICT in Indian classrooms.

RESULTS AND DISCUSSION

This study clearly shows that Indian school teachers have positive attitude and beliefs towards use of ICT in classrooms. This study do not support any gender differences in use of ICT as male and female teachers are at equal position in use of ICT. The research also reported that use of ICT in Indian school teaching is inadequate and insufficient. A good number of previous studies also investigated the reasons why teachers do not use computers in teaching (Winnans, and Brown, 1992; Dupagne and Krendl, 1992; Hadley and Sheingold, 1993) and a list of barriers was found that included lack of experience with ICT; lack of on-site support for teachers using technology; problems in supervising children when using ICT ; less number of ICT specialist teachers to teach students computer skills; lack of computer availability; lack of financial support and lack of time required to effectively integrate technology into the academics. It is needed to provide adequate opportunities to enhance skills of teachers in new technologies in Indian institutions. The teachers should also be motivated to use new technologies in classrooms. Regular professional training opportunities should be given to teachers to improve their interest in teaching with ICT. Findings of the research indicate the need of proper training and motivation of teachers to use ICT and provision of good infrastructure and technical help.

ICT use is not prevalent in government schools and it has been recognised that use of ICT in all government schools will prove to be an effort to bridge the digital and social divide. Further, training opportunities should also be provided to teachers during pre-service education. Effective ICT integration in pre-service teacher training is pivotal in use of ICT in teaching. Prospective teachers should be trained to make use of ICT a regular feature of their teaching routines. This study will also offer priceless information to Indian school administration as well as to educational policy makers regarding the nature of ICT contribution to the teaching learning process. Since the attitude and perceptions of the teachers are critical in determining how effectively an innovation is implemented, it is important to gauge how teachers perceive this innovation and its efficacy as a tool for effective teaching and learning.

The findings of this research have given more consideration to the level of ICT use to improve and encourage more use of ICT in Indian schools. Study also contributes to the existing body of research regarding the use of ICT for educational purposes in emerging countries. The

study endorses that future researchers should consider the in-depth qualitative studies including classroom observations and in-depth interviews to study the level of ICT use by teachers.

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