PERFORMANCE AND PERCEIVED COMPETENCY LEVEL OF KENDRIYA VIDYALAYA TEACHERS ABOUT INTEGRATION OF ICT TOOLS IN CLASSROOM TEACHING

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Abstract

This study presents survey findings about Kendriya Vidyalaya teachers' performances in operation of some basic hardware and software skills of ICT as well as perceived competency level of ICT tools. The data were collected through ICT Performance Test and Perception Scale from 20 teachers of four Kendriya Vidyalayas of Cuttack Zone. The results indicated that a large majority of the KV teachers well performed in operation of basic hardware and software skills of ICT. Further, majority of the KV teachers perceived competency level of ICT tools were found 'high competent' and 'very highly competent'. 'Use of ICT to support classroom learning and teaching' (M=4.72) was perceived as the highest competency. On the contrary, 'Use of hypermedia and multimedia tools to support instruction' (M=3.44) was perceived as the least competency.

Introduction

Teaching with technology is always better than teaching without technology. This statement is supported by number substantial research works done across the globe. In line of this statement, Cox, Abbott, Webb, Blakeley, Beauchamp and Rhodes (2003a) concluded that teachers' pedagogies had a large effect on pupils' attainment, with aspects such as the technologies selected, the ways in which they were deployed and the extent to which the teacher planned and prepared for the lesson, being significant. In a similar vein, Passey, Rogers, Machell, and McHugh (2004) concluded that, where ICT was clearly embedded in classroom activity, there was a positive impact on pupil attainment. Subsequently, Pittard, Bannister, and Dunn (2003) noted that evidence from large-scale studies showed that the use of ICT can motivate pupils and result in a positive effect on attainment amongst those pupils who make relatively high use of ICT in their subject learning where as ICT has become a regular part of the classroom experience, there is evidence of positive impact on learning and pupil performance. In this connection, studies have found evidence that the visual nature of some technologies, particularly animations, simulations and moving imagery, engaged learners and enhanced conceptual understanding.

Realizing the importance of information and communication technology, National Curriculum Framework-National Council for Educational Research Training, New Delhi (NCF-NCERT 2005) states:

Integration of Information and Communication Technologies (ICT) into schooling needs serious consideration. Teachers, educators, curriculum developers, evaluators and others will have to redefine their roles to tackle ICT rich environment and harness its full potential for the benefit of learners.

Consequently, Central Board of Secondary Education (CBSE) introduced project work in its curriculum to empower the teachers to be technological sophisticated so that the curriculum transaction truly reflects the shift in educational paradigm as envisaged in NCF 2005. As Kendriya Vidyalaya Sangathan (KVS) has the distinction of providing quality education in the Kendriya Vidyalayas by creating an environment that brings out the best among the teachers and students. The mandate given to the Kendriya Vidyalaya Sangathan (KVS) is to cater to the educational needs of children of transferable Central Government employees by providing a common programme of education, to pursue excellence and set the pace in the field of school education, initiate and promote experimentation and innovations in education in collaboration with other bodies like the CBSE, the NCERT etc. With its mission to provide good quality education to all children it introduced Project Work to align its educational objectives with that of CBSE as outlined by NCF-2005. Project Based Learning (PBL) is a comprehensive instructional approach to engage students in sustained, cooperative investigation (Bransford & Stein, 1993). It focuses on the central concepts and principles of a discipline, involves students in problem solving investigations and other meaningful tasks, allows students to work autonomously to construct their own knowledge, and culminates in realistic products. PBL is especially effective when supported by educational technology. Study by Davies (1997) show that the quality of learning can be greatly enhanced through the integration of ICT in

teaching. Research by Bransford (1994) showed that ICT enhances the critical thinking skills, information handling skills, the level of conceptualization and the problem solving capacity. ICT plays a critical role of enhancing the quality of education. This importance includes, in particular, helping teachers perform their teaching profession more effectively. To achieve this goal, teachers should be equipped with adequate ICT competencies in education. ICT competencies of teachers and how they perceive the role of ICT in teaching/learning process play key roles in the integration of ICT in schools. Analysis, design, development, implementation, use, evaluation, and management of educational technologies require diversified competencies and knowledge (Adelsberger, Collis & Pawlowski, 2002).

Kendriya Vidyalaya Sanganthan and Intel@ Association

Kendriya Vidyalaya Sangathana (KVS) with collaboration of Intel® has been giving different formal training i.e. 'Intel® Teach Essentials Course', 'Intel® Teach Skills for Success Course,' 'Technology and Community' and 'Technology at Work' for effective integration of technology in their classroom teaching. To facilitate KV(s) teachers in implementing innovative learning methodologies and making use of new technologies, Intel had also set up labs at Kendriya Vidyalaya, JNU; Kendriya Vidyalaya, Malleshwaram and Kendriya Vidyalaya, Fort William in the year 2000. In 2009 an ICT Resource Centre at the Zonal Institute of Education & Training Centre, Kendriya Vidyalaya Sangathan, Gwalior was also set up. The Resource Centre is now open for KV teachers for their Professional Development activities. It was inaugurated in March 2009. Intel® and KVS has jointly published a Project Based Learning digital booklet that focuses on bringing about a shift from the traditional teacher centered to student centered instruction. The booklet provides guidelines for developing projects that addresses the National Curriculum Framework 2005 objectives and contains ready to be implemented projects based on the CBSE guidelines. KVS have been doing continuous effort to provide quality education across the country by integrating ICT in terms of PBL. Further, for successful integration of ICT in teaching-learning process, KVS has been empowering its teachers ICT competencies and usage every year under staff and professional development scheme. It is need of the hour to answer do the KV(s) teachers have necessary knowledge and skills for successful implementation of new paradigm i.e. 'teaching with technology'.

Literature Review

Teachers' knowledge is an essential element in imparting knowledge to pupils. Knowledge in ICT is a must among teachers. The central question is, do teachers have the required knowledge of ICT? The study conducted by Nanasy (2001) revealed that computer competencies of prospective teachers. The results of his study indicated the highest level of computer competency appeared to be in word-processing (84.7%), e-mail (78.1%), and using the Internet (76.6%). The lowest level of computer competency seemed to be with presentation programs (29.9%), educational software (28.5%), desktop publishing (17.5%), database management (9.5%), website design (7.3%), and teleconferencing (3.6%). Similar to the Nanasy, according to Watson and Prestridge (2001), prospective teachers had the greatest competency in 'word processing' and the least competency in 'multimedia' and 'web page development'. According to Smith and Kubasko (2006), prospective teachers (interns) on average rated their skills with using ICT higher than that of their partnership K-12 teachers. The authors collected data from 60 intern teachers and their 60 partnership K-12 teachers using a questionnaire and interviews. Tınmaz (2004) investigated prospective teachers' competency level on a three-point scale. He found the general mean score was obtained 1.82. He reported results that prospective teachers were graduated with a less than moderate level competency.. The results of his study indicated the highest level of computer competency appeared to be with e-mail (M=2.31), and the lowest level of computer competency seemed to be with databases (M=1.18). A similar study by Toker (2004), conducted a survey of 1086 prospective teachers from Primary School Teacher Education department at Süleyman Demirel University in Turkey. He found that prospective teachers felt they were intermediate technology users (M = 3.17). Specifically, prospective teachers are at an intermediate level for using technology in educational environments (M = 3.43) and basic computer skills (M = 3.53). Turkmen

(2006) conducted a survey that determined science education faculty members' attitudes toward computer use. 62 science education faculty members from 20 different Turkish universities were surveyed. The results of his study showed that most of the Turkish science education faculty members perceived themselves as intermediate (46.8%) and/or advanced (46.8%) level technology users. It can be implied that the Turkish faculty members had the low mean scores in current knowledge level of educational technology usage and needs of science education, indicating they may not be prepared with skills necessary to succeed in the 21st century.

On the other hand there are studies which reveal that teachers do not acquire the necessary level of knowledge. Findings by Rosnaini & Mohd Arif (2010) show that a minority group of teachers were knowledgeable in basic ICT. The majority of them only had average knowledge in ICT. There were even a group of teachers demonstrated having very minimal knowledge of ICT. This scenario clearly shows that the key factor in making ICT programs successful in school is to upgrade the level of ICT knowledge among teachers. The study too confirmed there is a significant correlation between the levels of knowledge about ICT and the use of ICT in education. It could be concluded that the higher the level of knowledge on ICT the higher the level of use in education. Both Melor (2007) and Samuel & Zaitun (2007) findings conclude that ESL teachers have the positive attitude but are still lacking in skills as they are not well versed with many new software and limited infrastructure. Teachers too are lacking in trainings as well as expertise to offer help and guidance to enhance the learning process. Study conducted by Pramela and Noraza (2007) revealed that the teachers too have expressed that they need to spend more time in getting prepared to use the ICT as they are not well equipped with the knowledge and skills required. According to Akkoyunlu and Orhan (2003), prospective teachers were proficient (M=4.05) about ICT competencies. They surveyed 159 fourth year prospective teachers from 5 university departments of CEIT in Turkey. The undergraduate program in CEIT departments is designed to offer B.S. degree in computer education and instructional technology, and the graduates of this department are qualified to teach in ICT at basic and secondary education schools. Çınar (2002) examined the computer competencies of Turkish K-12 teachers. According to his results, the teachers felt themselves partly competent with computers, with the mean score of 2.62 (on a 4 level). They rated themselves most competent with word processing programs (M=3.56) and least competent with presentation and desktop publishing programs. Glazewski, Ku, Brinkerhoff, and Brush (2001) surveyed 139 prospective teachers and 37 K-12 teachers about their technology beliefs and skills. Their results showed that prospective and K-12 teachers held positive attitudes regarding technology overall, but may not possess a technology skill set which enables them to effectively integrate technology.

From the above research studies it can be concluded that findings regarding ICT knowledge and competency of the teachers are not consistent. While some of the research studies revealed that teachers well equipped with ICT knowledge and skills to integrate in classroom teaching where as other studies in similar tempo confirmed that some of the teachers are poorly or moderately competent enough to use in teaching purpose. In this juncture, it will be pertinent to say that a number research studies need to conducted in diverse context socio-cultural set up to confirm its maximum potentiality. Hence the present has explored the impact of ICT training in empowering KV teachers' knowledge and competency for large scale utilization of ICT tools for educational purpose.

Research Questions

The focus of this study is to reveal the existing status of KVs teachers with respect to operation of basic ICT skills as well as their perceived level of ICT competencies. This study was addressing the following research question:

1. What extent the teachers of KVs are competent in operating basic ICT skills?
2. What are the teachers' perceived competency level of ICT tools?

Methodology

Method

Researcher used survey method for this study.

Population and Sample of the Study

The target population of the present study consists of all teachers of KVs of Cuttack zone ranging from Class-I to Class-XII. By using simple random sampling the investigator has selected four KVs such as KV - Bidanasi, KV – Charbatia, KV – Dhenkanal, KV – Balasore out of 12 KVs from Cuttack zone. Further five teachers from each school were included in the study. In this way sample size of the present study were 20 teachers.

Tools Used

The following tools were used for the collection of data:

1. Information and Communication Technology Performance Test for Teachers: In order to know the basic competencies of teachers in operating desktop/laptop, a test was developed which consisted 24 questions covering various operational skill of ICT. Each question was scored under three categories such as 'well performed', 'performed' and 'unable to perform'.
2. Perception of Teachers about Competency Level of ICT tools: The perceived ICT competencies KV teachers were examined by using a five-point Likert-type ICT perception scale. The scale consisted 16 statements which includes both basic and advanced ICT competencies. The teachers rated their level of competency putting tick mark one of the five options i.e Completely insufficient, Insufficient, Neutral, Sufficient and Completely sufficient.

Analysis and Interpretation

I. Performance of KV teachers in Operating Basic ICT Skills

A large majority of Kendriya Vidyalaya teachers (83 %) 'well performed' in opening and shuting down the laptop/desktop as well as creating the word file and folder in desktop and save the same in C/D drive of desktop/laptop for future use. Subsequently, vast majority of teachers (more than 72 %) 'well performed' in using all the features of edit and formatting of the word file. Regarding the use of spread sheet to prepare bar diagram, graph and histogram, more than half of the teachers (55 %) 'well performed', 38 % 'performed' and 7 % of teachers were 'unable to perform' respectively. About More than 61 % of teachers 'well performed' in transferring file/folder from desktop to CD/Pen drive as well as scanning the same by using antivirus software. On other hand less than 6 % of teachers were unable to do the same. Cent percent of teachers 'well performed' in searching 5E model ICT integrated lesson plan on any school subject using any search engine and saved it in the desktop in the name of lesson plan. On enquiring the creation of own E-mail account and sending message to others from their account, large majority of teachers (94 %) 'well performed' where as 6 % of teachers couldn't do the same. Regarding the use of power point for creation of slides for classroom presentation, large majority of teachers (83 %) 'well performed' and 17 % of teachers 'performed'. With response to use of multimedia for classroom teaching, majority of teachers (77 %) 'well performed' in integration of sound, pictures, and video and 16 % of teachers performed and rest were unable to perform at all. Regarding edit of digital photograph and other graphic image, only 11 % of teachers well performed and 33 % of teachers performed. 56 % of teachers were able to convert pdf to word file and rest 44 % of teachers failed to do the same. A vast majority of teachers (94 %) well performed and performed in scanning the print material and saving it desktop. Regarding the use of a database to produce a list of addresses, 72 % of teachers well performed and another 18 % of teachers performed. On exploring the download of audio and video materials from the Internet, large majority of teachers (94 %) well performed

and performed. Further cent per cent of teachers well performed and performed in drawing pictures using mouse. On the other hand cent percent of teachers failed to construct a web page.

II.Perceived Competency Level of ICT of KV Teacher(s)

The perceived competency level of ICT were examined by using the ICT perception scale. The scale includes competencies of both basic and advanced ICT knowledge and skills. The teachers rated their levels of agreement with the statements by using a five-point Likert-type scale. As presented in below Table-1, the findings indicated that the majority of the KV teachers perceived themselves as competent in both basic and advanced ICT competencies. The majority were 'high competent' or 'Very highly competent' regarding most of these competencies. The majority of the KV teachers perceived their competency levels as 'sufficient' or 'completely sufficient' in the 'use of word processors for personal and institutional purposes' (94.43%, M=4.50), 'use of spreadsheets for personal and institutional purposes' (94.43%, M=4.27), 'Use of ICT for collecting data' (88.88%, M= 4.38), 'Use of computer aided instructional materials' (88.88%, M=4.22) and 'Use of presentation software (e.g. power point)', (88.88%, M=4.05). On the other hand, 'Identify legal, ethical and societal issues related to use of ICT' (49.99 %M=3.61), 'Use of hypermedia and multimedia tools to support instruction' (49.99% M=3.44), 'Use of ICT to support learning and teaching beyond classroom' (60.99% M=3.78) were perceived as the lowest competencies.

Table-1
Mean and S.D of KV Teachers' about Competency Level of ICT tools

S. NO	Area of Competencies/ Use	M	SD	% of "Sufficient" + "Completely Sufficient"
1	Use of operating systems	4.05	.78	72.21 %
2	Identify legal, ethical and societal issues related to use of ICT	3.61	.84	49.99 %
3	Use of word processors for personal and institutional purposes	4.50	.62	94.43%
4	Use of spreadsheets for personal and institutional purposes	4.27	.74	94.43%
5	Use of ICT for communication	4.05	1.07	77.77%
6	Use of ICT for collecting data	4.38	.70	88.88%
7	Use of communication tools to support instruction	4.05	.62	83.33%
8	Use of ICT to enhance personal development	3.94	.71	72.22%
9	Use of ICT to support learning and teaching beyond classroom	3.78	1.00	60.99 %
10	Use of ICT to support classroom learning and teaching	4.72	1.67	77.76 %
11	Use of computer aided instructional materials	4.22	.67	88.88 %
12	Use of ICT for knowledge management	4.16	.67	83.33 %
13	Use of presentation software (e.g. power point)	4.05	.62	88.88 %
14	Use of ICT in student assessment	3.94	.62	77.77 %
15	Use of ICT in course design	3.61	.81	76.66 %
16	Use of hypermedia and multimedia tools to support instruction	3.44	1.08	49.99 %
	Overall Mean	4.33		

Discussions

The results indicate that Kendriya Vidyalayas teachers have a high level performance in operating basic ICT skills. This means that these teachers are comfortable with number of basic ICT operating skills such as opening and shutting down the laptop/desktop, creating the word file and folder in desktop, using all the features of edit and formatting of the word file, using spread sheet to prepare bar diagram, graph and histogram, searching five E model ICT integrated lesson plan on any school subject, use of power point for creation of slides for classroom presentation, integration of sound, pictures, and video, converting pdf to word file, scanning the print material, using database to produce a list of addresses, download of audio and video materials from the Internet and drawing pictures by using mouse.

The results also indicate that Kendriya Vidyalayas teachers have a high level of perceived ICT competency such as use of word processors for personal and institutional purposes, use for communication use for collecting data, use to support classroom learning and teaching as well as to support learning and teaching beyond classroom, use of computer aided instructional materials, use of presentation software, use for knowledge management, use for student assessment and use for course design. This means that they trust that they can use ICT tools perfectively and that they are able to integrate these tools to their teaching process. Therefore, it can be concluded ICT training programmes provide them with the sufficient knowledge about ICT which in its role empowers them to use ICT tools for teaching-learning process.

The findings of this study are consistent with previous researches and literature that explored Teachers' knowledge and competency in operating ICT tools. Teachers were proficient about ICT competencies (Akkoyunlu and Orhan 2003; Çınar 2002; Nanasy 2001; Watson and Prestridge 2001). However a handful of research studies conducted by (Rosnaini & Mohd Arif 2010; Melor 2007; Samuel & Zaitun 2007; Pramela and Noraza 2007) revealed that there were even a group of teachers demonstrated having very minimal knowledge of ICT. The majority of them only had average knowledge in ICT. This scenario clearly shows that the key factor in making ICT programs successful in school is to upgrade the level of ICT knowledge among teachers. Further studies too confirmed there is a significant correlation between the levels of knowledge and competency about ICT tools and the use of ICT in education. It could be concluded that the higher the level of knowledge on ICT the higher the level of use in education.

Conclusion and suggestions

Findings of the study shows that majority of the KV teachers are comfortable in operation of basic ICT skills as well as competent enough in integrating of various ICT tools in teaching learning process. On the other hand small fraction of KV teachers have also been averagely equipped with ICT knowledge and competency; most of the teachers still have difficulty in using certain applications such as course design, use of hypermedia and multimedia tools to support instruction. Subsequently, ICT tools are changing very fast. Thus continuous training and orientation of both newly appointed teachers and experienced teachers to the new learning technologies is an immediate requirement. In order to accelerate the process of integration of ICT into their pedagogical practices frequently, the curriculum framework needs to be flexible enough and space for integration ICT inputs. Accordingly, the administrative authority should provide adequate time and resources to ensure high quality and appropriate learning.

The present work has been confined only ICT knowledge and level of competency of KV teachers, there is further scope to undertake in-depth research to know how they are using ICT tools in real classroom situations. What are barriers KV teachers are most frequently faced while integrating ICT tools. Another study can be undertaken to know the relationship between KV teachers' confidence level with their stream and experiences.

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