

## **Relationship of Awareness of ICT, Use of ICT, Attitude towards ICT with Teaching Effectiveness**

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### **I. Introduction**

Information and Communication Technology (ICT) is the buzzword today everywhere as the world has entered into an information and communication age. Computers have proliferated, becoming increasingly fast, powerful, small and cheap, so that now there is scarcely a human activity in which they are not to be found, bearing an increasing share of the burden of repetitive information processing activities. Now, information cannot only be stored, retrieved, communicated, and broadcasted in enormous quantities and at phenomenal speeds, but it can also be rearranged, selected and transformed, of the human brain. While creative, judicious, moral, and aesthetic choices are still best left to people, all the tedious and mechanical mental processes can now be relegated to the accurate, fast, and tireless machines. Now a day's, ICT is the most powerful, effective, easy and rapid media in the communication of information. Hence, in the present study an effort has been made to study the relationship of awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness.

#### **Awareness of ICT**

The explosion of digital technology has created a revolution in educational instructions. The flexibility, high speed and huge storage capacity of ICT is causing teachers to redefine and rethink the traditional process of teaching. The challenges facing teachers are to evaluate relevant applications of information and communication technologies in the teaching learning process. At the same time, instruction utilizing information and communication technologies must reflect what is known about effectiveness of student-centered teaching and learning process. The digitization of technologies has made a great impact on teachers' role. The impact can be felt in many ways. Digital technologies are changing the ways teachers interact with students in the classroom. As the importance of language to learning, the ways organizing and relating information facilitates understanding and the influence of social factors in the classroom are all impacted by digital technologies. Now the instructional approaches are also influenced greatly, as they are incorporated by a variety of technologies. Now teachers and students alike are interacting in new ways afforded by digital technologies. Teachers and students have virtual discussions related to course content, advice and counseling in a wide variety of times and paces through email and other features of the web.

#### **Use of ICT**

In the new technology era, the role of teachers has changed and continues to change from being an instructor to a constructor, facilitator, and coach to create learning situation and environment. ICT is very useful for teachers with this new roles. Teachers can integrate ICT into teaching-learning process effectively if he developed various skills and competences like, creativity, flexibility, logistic skills, skill for project work,

administrative and organizational skills and collaborating learning skill. Apart from these skills and competencies, the effective and efficient use of ICT depends largely on the technical competency, 20 attitude, appreciation of teachers for ICT. They should be able to appreciate the potential of ICT and have positive attitude towards ICT. They should operate computer and use basic software for work processing, spreadsheets and power point etc. They have to evaluate the use of computers and related ICT tools in education of students. The minimum use of ICT by teachers are desired.

### **Attitude towards ICT**

An effective educational environment is also characterized by a positive school climate where the teachers and students feel good about teaching and learning and cooperate to foster a caring attitude. Attitude has great importance in learning and teaching. It is one of the important objectives of teaching and learning to develop attitudes in the aspects and process of school subjects. A review of the psychological literature reveals diverse definitions of attitudes. The productive use of *ICT* depends on a teacher's attitude towards *ICT*. Some teachers are often resistant of using *ICT* in classroom. So, the development of positive attitude towards *ICT* in teachers is considered to be a key factor in fostering *ICT* integration and enhancing the quality of learning and teaching using *ICT*. Teachers are using *ICT* tools such as computer, projector, TV and video, overhead projector and internet.

### **Teaching Effectiveness**

The term, 'Teacher Effectiveness' implies the effectiveness of a teacher, i.e., Teacher Effectiveness deals with the performance of an individual teacher. An effective teacher succeeds in producing desired changes among the behaviors of his students with respect to his prefixed objectives and he is satisfied with his profession. From this point of view, it can be said that a teacher whose students achieve larger gains is the effective teacher (Kennedy, 2010; Kupermintz, 2003).

Research offered a glut of definitions of an effective teacher. According to Clark (1993), effective teachers can develop students achievement by increasing students' knowledge. According to Dunkin (1997), effective teachers can attain desired students achievements by their knowledge, skills, performances and behaviours. Effective teacher consistently achieve the goals regarding their students' learning (Anderson, 1991; Kennedy, 2010). Effective teachers also could achieve the goals, determined by others such as Ministries of Education, Legislators, school administrators and other Govt. Officials (Campbell et al., 2004; Parihar, 2011). Weimer (2013) said that effective teachers could develop thinking skills, interest and motivation among their students to learn. According to Harris, Ingle, and Rutledge (2014), most effective teachers are different from other teachers by their teaching skills, motivation, personality, enthusiasm, contributions and by their relationships with co-workers. According to Charlotte Danielson (1996), effective teaching is the association of four aspects of observable teacher behaviours i.e., planning and preparation, instruction, and professional responsibilities. Walls (1999) summarized and described Teacher Effectiveness under four headings i.e. the four acs of teaching' which linked teachers' work with students' learning and achievement in a process-product concept. Students learning could be better, faster, and more long-lasting when teachers could be able to play the Four Aces'.

### **Review: An Overview**

In review of the related studies, most of the studies are either related to awareness or use of technology. It can be further stated that most of the studies are specifically related to the computer and internet further looking at a glance to the above studies, it can be revealed that most of the studies were conducted abroad and very few studies were conducted in India. Many of the studies revealed that a great degree of awareness about

the ICT of teachers but less usage due to one or other reasons. Further, it was found that there were many studies carried out related to teachers' awareness of technology and teachers use of technologies but only few studies conducted which are related to the teachers need of technologies.

The variables teachers' attitude towards *ICT* and their technology competence are explored vastly and independently in some studies. The investigator feels that there is a need to further explore the influence of these variables in order to improve teaching learning process. The review of related literature presents a glut of researches presently being conducted in field of variables like use of *ICT*, their attitude towards *ICT* and technology competence. Based on the research studies, the researcher felt that there is a need to explore the use of *ICT* by teachers in relation to their attitude towards *ICT* and technology competence in schools that it will help to adjudged the extent of all the variables related to teachers and suggest measures to overcome the problems of teachers in the application of *ICT* in teaching-learning Process.

Some of studies revealed that 100% ICT awareness of ICT prevailed among the teachers while some other studies revealed moderate or less awareness of teachers about ICT. Most of the studies revealed that the use of technology is more among the young teacher in comparison to the old teachers. Use of technology was found more among teachers in abroad where as less usage of technologies were found among Indian teachers. No study has been conducted so far found with the combination of ICT awareness, use and need of teachers in integration whole. Hence the present study is an attempt in this direction to study the ICT awareness, use and need of secondary and higher secondary school teachers.

### **Statement of the Problem**

The present study entitled "*Relationship of Awareness of ICT, Use of ICT, Attitude toward ICT with Teaching Effectiveness*".

#### **Variables**

##### **Independent Variables**

- i. Awareness of ICT
- ii. Use of ICT
- iii. Attitude towards ICT

##### **Dependent Variable**

- i. Teaching Effectiveness

##### **Demographic Variables**

- i. Gender – Male / Female
- ii. Locality – Urban / Rural

## **II. Objectives of the Study**

Following objectives are formulated for the present study :

1. To investigate the relationship of awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among primary school teachers.
2. To investigate the relationship of awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among male primary school teachers.
3. To investigate the relationship of awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among female primary school teachers.

4. To investigate the relationship of awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among urban primary school teachers.
5. To investigate the relationship of awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among rural primary school teachers.

### **Research Hypotheses**

Following hypotheses are formulated to realize the above mentioned objectives :

1. There is a positive and significant relationship between awareness of ICT, use of ICT, attitude toward ICT, with teaching effectiveness among primary school teachers.
2. There is a positive and significant relationship between awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among male primary school teachers.
3. There is a positive and significant relationship between awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among female primary school teachers.
4. There is a positive and significant relationship between awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among urban primary school teachers.
5. There is a positive and significant relationship between awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness among rural primary school teachers.

## **III. Research Design**

### **Research Method**

The present study was a descriptive survey research. The method deals with the relationship between the variables, the testing of hypotheses, and the development of generalizations, principles or theories that have universal validity. Descriptive research has been divided into several types, however, they are all attempting to find generalizable attitudes, and they all deal with present conditions. The study was focus on the investigation of awareness of ICT, use of ICT, attitude towards ICT and their relationship with teaching effectiveness of primary school teachers.

### **Sample**

The list of all the primary schools of Chitradurga district (prepared by DIET of Chitraduraga) was constituted the population for the study. Using stratified random sampling method 50 primary schools were selected. Primary school teachers from each school were selected randomly. In all 548 primary school teachers were involved in the present study.

### **Tools Used**

The following research tools were used to collect the essential data. They are : Awareness of ICT Scale, Use of ICT Scale, Attitude towards ICT Scale, Teaching Effectiveness Scale. The investigator ensured the content and face validity of the present scales since each item was judged by content experts. The investigator used Split Half method to compute the reliability coefficient of Scales.

### **Collection of Data**

Data collection is one of the most important tasks of any research. As far as the problem under study is concerned, the data were collected properly, timely and precisely since it helps in finding the solutions to the problems. For the present study, the required data were collected from the primary school teachers by personally visiting the schools. For this purpose, the investigator personally contacted the school principals and explained

the purpose of the study. After that scales were administered to the teachers and the completed tools were collected from the respondents. Self rating scale was used in order to measure the teaching effectiveness of teachers.

### Statistical Techniques

The data on variables in the study was properly coded to suit the computer analysis. The analysis was carried out on the basis of objectives of the study and hypotheses formulated by applying appropriate statistical techniques. In pursuance of the Objectives – 1 to 5 the Pearson's Product-Moment Coefficient of Correlation technique was used to find out the relationship between independent variables and dependent variable.

### Analysis :

The relationship between awareness of ICT, use of ICT, attitude toward ICT with teaching effectiveness is analysed using correlation coefficient.

### Entire Sample

**Table – 1 : Relationship between Awareness of ICT, Use of ICT and Attitude toward ICT with Teaching Effectiveness – Entire Sample**

Variables	Teaching Effectiveness				
	r-value	df	t-value	p-value	Signi.
Awareness of ICT	0.7359	547	25.4178	< 0.05	Yes
Use of ICT	0.6009	547	17.5820	< 0.05	Yes
Attitude toward ICT	0.6986	547	22.8342	< 0.05	Yes

### Interpretation

The analysis of the above table reveals the following :

1. Since the obtained 't' value 25.4178 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between awareness of ICT of teachers and their teaching effectiveness.
2. Since the obtained 't' value 17.5820 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between use of ICT of teachers and their teaching effectiveness.
3. Since the obtained 't' value 22.8342 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between attitude towards ICT of teachers and their teaching effectiveness.

### Findings

The interpretation of the data reveals the following findings :

1. There is a positive and significant relationship between awareness of ICT of primary school teachers and their teaching effectiveness.

2. There is a positive and significant relationship between use of ICT of primary school teachers and their teaching effectiveness.
3. There is a positive and significant relationship between attitude towards ICT of primary school teachers and their teaching effectiveness.

### Male Teachers

**Table – 2 : Relationship between Awareness of ICT, Use of ICT, Attitude toward ICT with Teaching Effectiveness – Male Teachers**

Variables	Teaching Effectiveness				
	r-value	df	t-value	p-value	Signi.
Awareness of ICT	0.7444	280	18.6543	< 0.05	Yes
Use of ICT	0.6090	280	12.8473	< 0.05	Yes
Attitude toward ICT	0.7160	280	17.1629	< 0.05	Yes

### Interpretation

The analysis of the above table reveals the following :

1. Since the obtained 't' value 18.6543 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between awareness of ICT of male teachers and their teaching effectiveness.
2. Since the obtained 't' value 12.8473 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between use of ICT of male teachers and their teaching effectiveness.
3. Since the obtained 't' value 17.1629 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between attitude towards ICT of male teachers and their teaching effectiveness.

### Findings

The interpretation of the data reveals the following findings :

1. There is a positive and significant relationship between awareness of ICT of male primary school teachers and their teaching effectiveness.
2. There is a positive and significant relationship between use of ICT of male primary school teachers and their teaching effectiveness.

3. There is a positive and significant relationship between attitude towards ICT of male primary school teachers and their teaching effectiveness.

#### **Female Teachers**

**Table – 3 : Relationship between Awareness of ICT, Use of ICT, Attitude toward ICT with Teaching Effectiveness – Female Teachers**

Variables	Teaching Effectiveness				
	r-value	df	t-value	p-value	Signi.
Awareness of ICT	0.7294	265	17.3587	< 0.05	Yes
Use of ICT	0.5938	265	12.0152	< 0.05	Yes
Attitude toward ICT	0.6841	265	15.2680	< 0.05	Yes

#### **Interpretation**

The analysis of the above table reveals the following :

1. Since the obtained 't' value 17.3587 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between awareness of ICT of female teachers and their teaching effectiveness.
2. Since the obtained 't' value 12.0152 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between use of ICT of female teachers and their teaching effectiveness.
3. Since the obtained 't' value 15.2680 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between attitude towards ICT of female teachers and their teaching effectiveness.

#### **Findings**

The interpretation of the data reveals the following findings :

1. There is a positive and significant relationship between awareness of ICT of female primary school teachers and their teaching effectiveness.
2. There is a positive and significant relationship between use of ICT of female primary school teachers and their teaching effectiveness.
3. There is a positive and significant relationship between attitude towards ICT of female primary school teachers and their teaching effectiveness.

*Urban Teachers*

**Table – 4 : Relationship between Awareness of ICT, Use of ICT, Attitude toward ICT with Teaching Effectiveness – Urban Teachers**

Variables	Teaching Effectiveness				
	r-value	df	t-value	p-value	Signi.
Awareness of ICT	0.7840	189	17.3635	< 0.05	Yes
Use of ICT	0.5690	189	9.5129	< 0.05	Yes
Attitude toward ICT	0.7415	189	15.1954	< 0.05	Yes

**Interpretation**

The analysis of the above table reveals the following :

1. Since the obtained 't' value 17.3635 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between awareness of ICT of urban primary school teachers and their teaching effectiveness.
2. Since the obtained 't' value 9.5129 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between use of ICT of urban primary school teachers and their teaching effectiveness.
3. Since the obtained 't' value 15.1954 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between attitude towards ICT of urban primary school teachers and their teaching effectiveness.

**Findings**

The interpretation of the data reveals the following findings :

1. There is a positive and significant relationship between awareness of ICT of urban primary school teachers and their teaching effectiveness.
2. There is a positive and significant relationship between use of ICT of urban primary school teachers and their teaching effectiveness.
3. There is a positive and significant relationship between attitude towards ICT of urban primary school teachers and their teaching effectiveness.

**Rural Teachers**

**Table – 5 : Relationship between Awareness of ICT, Use of ICT, Attitude toward ICT with Teaching Effectiveness – Rural Teachers**

Variables	Teaching Effectiveness				
	r-value	df	t-value	p-value	Signi.
Awareness of ICT	0.7083	356	18.9326	< 0.05	Yes
Use of ICT	0.6241	356	15.0714	< 0.05	Yes
Attitude toward ICT	0.6757	356	17.2956	< 0.05	Yes

**Interpretation**

The analysis of the above table reveals the following :

1. Since the obtained 't' value 18.9326 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between awareness of ICT of rural primary school teachers and their teaching effectiveness.
2. Since the obtained 't' value 15.0714 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between use of ICT of rural primary school teachers and their teaching effectiveness.
3. Since the obtained 't' value 17.2956 is greater than the tabled 't' value 1.96 at 0.05 level, the hypothesis that  $r_{pop}$  is zero is rejected. It thus implies that the obtained correlation is a significant. This reveals that there is relationship between attitude towards ICT of rural primary school teachers and their teaching effectiveness.

**Findings**

The interpretation of the data reveals the following findings :

1. There is a positive and significant relationship between awareness of ICT of rural primary school teachers and their teaching effectiveness.
2. There is a positive and significant relationship between use of ICT of rural primary school teachers and their teaching effectiveness.
3. There is a positive and significant relationship between attitude towards ICT of rural primary school teachers and their teaching effectiveness.

**Conclusions**

1. Awareness of ICT, Use of ICT, and Attitude towards ICT of primary school teachers are having positive and significant relationship with their teaching effectiveness.
2. Male primary school teachers' Awareness of ICT, Use of ICT, and Attitude towards ICT, are having positive and significant relationship with their teaching effectiveness.
3. Female primary school teachers' Awareness of ICT, Use of ICT, and Attitude towards ICT are having positive and significant relationship with their teaching effectiveness.

4. Urban primary school teachers' Awareness of ICT, Use of ICT, and Attitude towards ICT are having positive and significant relationship with their teaching effectiveness.
5. Rural primary school teachers' Awareness of ICT, Use of ICT, and Attitude towards ICT are having positive and significant relationship with their teaching effectiveness.

### **Discussion**

The present study has revealed a positive and significant relationship between teachers' awareness of ICT and its use in classroom teaching and their attitude towards ICT have positive impact on their teaching effectiveness. Even the analyses of data among the sub-samples like male teachers, female teachers, urban teachers and rural teachers have also revealed the same findings. This implies that selected ICT related variables have positive influence on their teaching effectiveness in the classroom. The research studies conducted earlier on educational innovation suggests that it is important for schools to share a reformed vision of teaching and learning in order to create sustainable change in the classroom. With respect to ICT integration research suggests that it tends to improve learning, motivate and engage learners, promote collaboration, foster enquiry and exploration, and create a new learner centered learning culture. Since ICT provides greater opportunity for both teachers and students to adjust learning and teaching to individual needs it is necessary to improve and promote the integration of ICT in classroom teaching.

ICT enabled education will always support, enhance, and optimise the delivery of information during classroom teaching. Worldwide research has shown that ICT can lead to an improved student learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan, proved that an increase in the use of ICT in education with integrating technology to the curriculum has a significant and positive impact on students' achievement. The results specifically showed that the students who are continuously exposed to technology through education has better 'knowledge', presentation skills, innovative capabilities, and are ready to take more efforts into learning as compared to their counterparts.

### **Educational Implications**

There is a need of skill training to the school teachers because the findings of the study suggest that computer trained teachers were using more ICT resources than the computer untrained teachers. The finding of the study should be given to the government authority so as to take the necessary steps in this direction.

The variables like Type of school in which teachers are teaching, teaching experience have great impact on ICT awareness, use and need of teachers. For example, private school teachers were using ICT resources more than that of private aided school teachers. It may be due to availability of ICT resources. So Government should increase the school infrastructure in terms of ICT so as to increase and improve the teachers use of ICT.

The most outstanding characteristics of any research is that it must contribute something new to the development of the area concerned. So, an investigator should find out the educational implications of the study. This study has implications for teachers, students in particular and the whole educational system in general. Technology is becoming more and more dominant in our society. Technology is all around us whether we want it to be or not: it is the vehicles we drive. Upgrades are being made and new innovations are being discovered every day in field of information and communication technology (*ICT*). *ICT* has had a major impact on our school systems and is still impacting it today. *ICT* enables all students to master more complex subjects via rich interactions with resources outside of classroom walls just as geographically distributed workers create, share, and master knowledge.

Thus, technology is impacting the young mind to a great extent. However, the issue is not whether instructional tools are more efficient at accomplishing current goals of education, but instead how much is this emerging technology being explored by teachers in their classrooms with high morale, positive attitude and required technology competence, so that it can provide an effective means of reaching essential educational objectives in the technology-driven evolution of a knowledge-based economy.

This research attempted to provide a few recommendations that may help in developing morale, attitude towards ICT and technology competence among primary school teachers. The study revealed that majority of the primary school teachers are at a moderate level of awareness and use of ICT. In order to make teachers reach a higher level of awareness and use of ICT, there is a need to implement more ICT resources and to provide opportunities to them to utilize and integrate ICT to its fullest potential in their classroom teaching.

## References

- [1.] Abas, Z. W. (1995) *Attitudes towards Using Computers among Malaysian Teacher Education Students*. World Conference on Computers in Education VI : WCCE' 95 Liberating the Learner, 153-162. London: Chapman & Hall.
- [2.] Adams, D., Carlson, H., & Hamm, M. (1990) *Cooperative Learning and Educational Media : Collaborating with Technology and each other*. Englewood Cliffs, Nj : Education Technology Publications.
- [3.] Agarwal, R. (2000) *Educational Technology and Conceptual understanding*. ANMOL Publications Pvt. Ltd. New Delhi.
- [4.] Alessi, S. M. & Trollip, S. R (2001) *Multimedia for Learning: Methods and Development*. Needham Heights: Allyn & Bacon.
- [5.] Bicknell, J. E. (1959) *Prediction of Effectiveness of Secondary School Teachers*. Albany, New York : State Board of Education.
- [6.] Blankenship, S. E. (1998) *Factors Related to Computer use by Teachers in Classroom Instruction*. Doctoral Dissertation, Virginia Polytechnic Institute and State University.
- [7.] Buch, M.B. (Ed.) (1979) *Second Survey of Research in Education*. Baroda : Society for Educational Research and Development.
- [8.] Carter, C. and Monaco, J. (1987) *Learning Information Technology Skills*. **Library and Information Research Report** 54. London: The British Library.
- [9.] Delcourt, M. A., & Kinzie, M. B. (1993) *Computer Technologies in Teacher Education : The Measurement of Attitudes and Self-efficacy*. **Journal of Research and Development in Education**, 27, 35-41.
- [10.] Dupagne, M., & Krendl, K.A. (1992) *Teachers' Attitudes toward Computers : A Review of the Literature*. **Journal of Research on Computing in Education**, 24(3), 420-429.
- [11.] Dwyer, D., (1991) *Changes in Teachers Beliefs and Practices in Technology Rich- Classrooms*. **Educational Leadership**, May, pp. 45-52.
- [12.] Evans-Andris, M. (1995) *Barrier to Computer Integration : Micro-Interaction among Computer Co-ordinators and Classroom Teachers in Elementary Schools*. **Journal of Research on Computing in Education**, 28, 29-45.
- [13.] Higgins et al. (2005) *Does ICT Improve Learning and Teaching in Schools? A Professional User Review of UK Research Undertaken for the British Educational Research Association*. Newcastle University.
- [14.] Levine, T., & Donitsa-Schmidt, S. (1998) *Computer Use, Confidence, Attitudes and Knowledge : A Causal Analysis*. **Computers in Human Behaviour**, 14, 125-146.
- [15.] Myers, J. M., & Halpin, R. (2002) *Teachers' Attitudes and Use of Multimedia Technology in the Classroom : Constructivist-based Professional Development Training for School Teachers*. **Journal of Computing in Teacher Education**, 18(4), 133-140.
- [16.] Tsitouridou, M. & Vryzas, K. (2003) *Early Childhood Teachers' Attitudes towards Computer and Information Technology : The Case of Greece*. **Information Technology in Childhood Education**, 1, 187-207.
- [17.] Venezky, R. L. (2004) *Technology in the Classroom : Steps toward a New Vision*. **Education Communication & Information**, 4(1), 3-21.
- [18.] Watson, G. (2006) *Technology Professional Development : Long-Term Effects on Teacher Self-Efficacy*. **Journal of Technology and Teacher Education**, 14 (1), 151-166.
- [19.] Williams, D., Coles, L., Richardson, A., Wilson, K., & Turson, J. (2000) *Integrating ICT in Professional Practices an Analysis of Teachers' Needs Based on a Survey of Primary and Secondary Teachers in Scottish Schools*. **Journal of Information Technology in Teacher Education**, 9(2), 167-82.