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TRENDS IN RESEARCHES RELATED TO ICT IN EDUCATION

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ABSTRACT

This paper presents a review of researches done during the period of 2000 to 2015 on role of ICT in Education and Research to determine research trend in the field. These are discussed in term of 'ICT in Education', 'Educational Research on internet' and 'web resources in education and research'.

The published and unpublished articles, research reports, dissertation and theses were reviewed offline and online for this study. The aim of this paper is to address the questions like what are the main research areas in role of ICT in education and research, What is the trends towards the application of research method, What is the trend in India and abroad for these type of research and at which time these researches have been conducted. Based on the review of



research area and trends, the results can be used to explore the body of knowledge in role of ICT in education and research to identify priority areas for future research projects.

KEYWORDS: ICT, education, e-resources, internet, research, trends etc.

BACK GROUND AND RATIONALE

ICT is a new medium, a new way of representing, communicating and working with information. ICT has emerged as one of the most important aspects of human life. Each & every human activity involves the use of ICT to some extent, may be

visiting a department store, booking tickets, paying bills, gathering data, getting a book issued in the library, performing an experiment, making a document, writing an application or even communicating with friends. One cannot hope to survive in the technological world without its knowledge.

Arrival of computer & internet in the field of education has changed the procedure and pattern of education. Internet has become the best medium to update the knowledge of teacher. The students who are in the field of education have to gather data concerning the field, so internet has

to be one of the dominant sources. In the field of this fast and mechanical era, students and teachers both have no time to interact with one another. In these circumstances student become unidirectional and feel restless. Internet apparently provides a solution of these problems (Kant, 2009).

Without the knowledge of internet, one is likely to lag behind and be handicap. The importance of internet can be seen everywhere. It is information technology which makes our life faster & comfortable, if it is used properly. So first we must know what ICT is. ICTs stand for Information and Communication Technologies.

ICTs are defined, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage

information.”

(UNDP, 2000)

“ICT refers to forms of technologies that are used to create, store, share or transmit, exchange information.” (UNESCO 2002)

Information and communication technology is sharing and interchanging information such as knowledge, mental, skills, motor skills and attitude through the mass media and electronics. These developments in the field of ICT can be used in strengthening the future educational process so that educational reconstruction in future will be meaningful and effective.

Use of ICT in education has the following advantages- lower cost, time saving, flexibility, faster response, greater effectiveness, better morale, greater competitiveness and easy access to information and resources. Invention of internet has created a great revolution in the field of information exchange & knowledge sharing. Currently the people of all fields are using internet & use available knowledge & resources to make their work easy.

Information and communication technologies (ICTs) offer innumerable benefits in enriching the quality and quantity of learning in universities. Their integration with research will not only revolutionise education, they will engender the development of students' innate scientific inquiry mind and their critical thinking abilities. New lecturers must be inducted to develop the needed skills in the use of ICTs and to develop positive attitude towards their use for teaching and research.

The fields of education i.e. teaching learning and research, have been affected by ICTs, ICTs have the potential to innovate, accelerate, enrich and deepen skills to motivate and encourage students, to help in relating school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change.

Around the globe all countries are conducting such type of researches in different area of ICT and education for the improvement of quality education and for gaining new scientific and logical knowledge of education.

The past researches have been responsible for the present attire of a study to a certain extent, in other words provide the conceptual as well as methodological support. It enables to avoid the duplication of research work and glimpses into the earlier studies for the understanding of the research problem.

According to C. V. Good, “The key to the vast store house of published literature may open doors to sources of significant problems and explanatory hypothesis and provide helpful orientation for definition of the problems, background for selection of procedure, and comparative data for interpretation of results. In order to be truly creative and original one must read extensively and critically as a stimulus to thinking”.

The present article discusses the review of related literatures published in journals, surveys, books, published and unpublished thesis, dissertations and online database & resources dealing with various interdisciplinary aspects viz. information and communication technology in education, electronic research, information seeking behaviour, web resources etc.

The studies have been divided into three core groups: studies related to ICT in education, studies related to Educational Research on internet, studies related to web resources. The aim of this paper is to address the questions in the following areas-

- Issue in review researches- What are the main research area in ICT in Education and research?
- Research methods- Trends towards the application of research method.
- Place of Research- What is the trend in India and abroad for these types of researches?
- Time of Research- At which time these researches have been conducted?

So that, researcher can examine the trends of educational research in role of ICT in education and research as well to reflect on the major issues and their strength and weakness.

ISSUE IN REVIEW RESEARCHES

In the present trend survey 73 studies have been reviewed reported during 2000-2015 under three categories. One related to 'ICT in Education', the other related to 'Educational Research on Internet' and the third

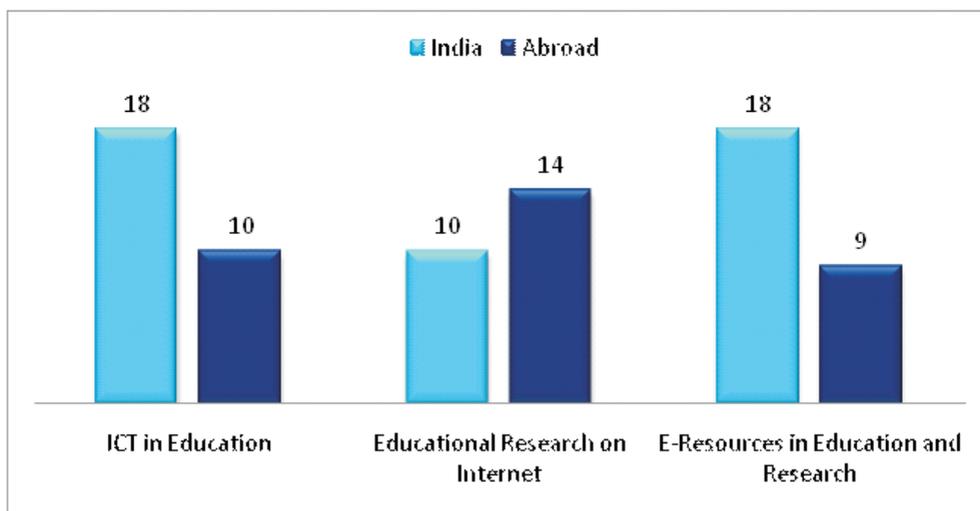
related to 'E-Resources in Education and Research' as shown in table 1-

Table 1: Matrix of Reviewed Studies

S.N.	Issue of the study	Area	No. of studies	Total
1	ICT in Education	India	18	28
		Abroad	10	
2	Educational Research on Internet	India	10	24
		Abroad	14	
3	E-resources in Education and Research	India	18	27
		Abroad	9	
Total			79	79

The above table shows that overall 73 studies have been reviewed related to 'Role of ICT in Education and Research' to know its trends in research during 2000 -2015. It is found that 18 studies from India and 9 studies from abroad have been reviewed with respect to 'ICT in Education'. Similarly total 21 studies have been reviewed on 'Educational Research on Internet' out of which 7 are conducted in India and 14 are in abroad. Whereas total 25 studies have been reported in India (17) and abroad (8) related to use of 'E-resources in Education and Research'. This can be well understood through the following graph 1-

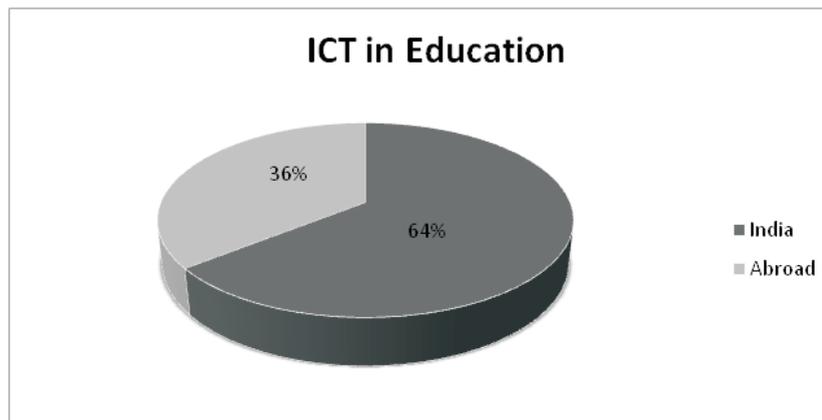
Graph 1: Matrix of Reviewed Studies



It is visible in graph 1 that the most explored area is 'ICT in Education', having 28 studies while 24 studies have been done in 'Educational Research on Internet'. There are 27 studies those have been tried to explore the E-Resources in Education and Research.

Studies Related to ICT in Education

A majority of research studies surveyed for this trend report are on 'ICT in Education'. It is found that 18 (64%) studies from India and 10 (36%) studies from abroad have been reviewed with respect to 'ICT and Education' as shown in the following pie chart-

Graph 2: Matrix of Studies Related to ICT in Education

Some studies are purely on effectiveness of multimedia and ICT in teaching and learning different subjects like Geography, Biology, Mathematics, English etc. While other are on impact and effect of using ICT on students achievement. Some are on attitude towards use of ICT.

Shrinivasahu (2011), Amruth and Devika (2008), Thilaka and Pramila (2000), Anboucarasy (2010), Girija.N Shrinivasahu, Angel Rathnabai & G. Vishwanathappa (2013, Satyaprakasha, C.V., Behera Sunitha (2014), Gupta, Rainu & Tyagi, Sushma (2014) studied about the effectiveness of multimedia in teaching and learning.

Wei-chin Chang (2012) S.K. Verma (2011), Pradeep and Nakkeeram (2010), Rob Edmunds(2012), Jayaraman (2010), Narendra and Geeta (2010), Gerry(2006), DickyUrianto (2006), Subbaiah (2005), Carroll, Jann (2011) studied about the effectiveness of ICT in teaching learning process and also studied about the attitudes of teacher and students towards ICT for education.

Rob Edmunds and Grainne Conole (2012) explored the technological change and its impact on literacy learning while Khaled Nahes Al Qtaibi (2012) took a study to find out the students attitude towards the use of ICT in course study, work and social activity.

Wei-Chih Chang (2012) studied the effect of computer-mediated communication on attitudes of students and implications for EFL learning while Noel Steplen, Fency Merline Sowmya & M Senthil Kumar (2014) did a experimental study to discover the the effect of computer assisted instruction package as a self learning material in learning English grammar.

Verma, S.K (2011) as Ph.D. work took up the study on use of communication technologies by male and female teachers of professional courses and Bhowmick, Debashis (2014) explored the use of ICT in Education in India, Senthur Velmurugan. G. Amudha (2015) studied the use of ICT based resources and services among the users of arts and science colleges in Virudhunagar District, Master, R, Pravinchandra (2015) found out the use of educational technology by IGNOU B.Ed. Students.

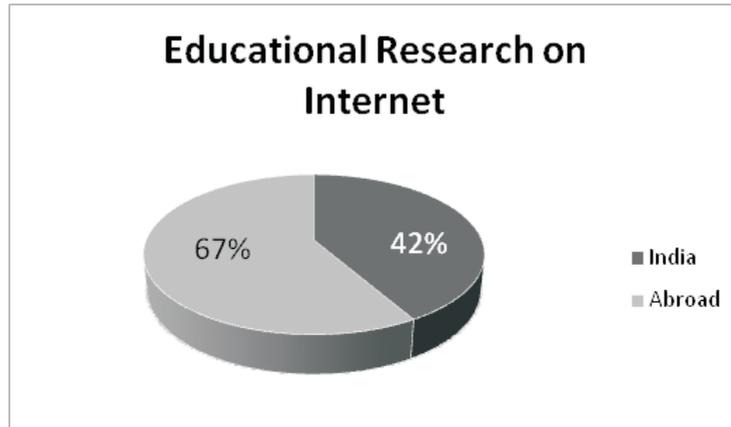
Gerry K. White (2006) discussed about ICT in Education while Mehta Basant and Madhwani Ranjeeta (2014) conducted a study on Internet and Education

Ananthula Raghu (2015) took a study about the secondary school teachers' applications and usage of computer with their computer knowledge and their attitude towards computers and Prashantha kumara, T.M. (2015) opined on the enhancing process of teaching learning through technology in classroom.

Studies Related to Educational Research on Internet

Internet is the vast source of vast knowledge. Today aspirers can satiate their thirst for knowledge by means of internet. As wealth of information and knowledge is available on internet in different area, the value of internet cannot be over-emphasized in research design and implementation of experimental and descriptive studies, statistical analysis, data production and storage, and dissemination of research information. Total 24 studies have been reviewed on Educational Research on Internet, out of which 10 (42%) are conducted in India and 14 (67%) are in abroad as shown in the following pie chart-

Graph 3: Matrix of Studies related to Educational Research on Internet



Murthy (2013), Anil & Monika (2013), Umesh & Rajesh (2009), Mahajan (2006), Patil & Parmeshwar (2009) conducted studies specifically on use of internet by researchers and faculty members in Research.

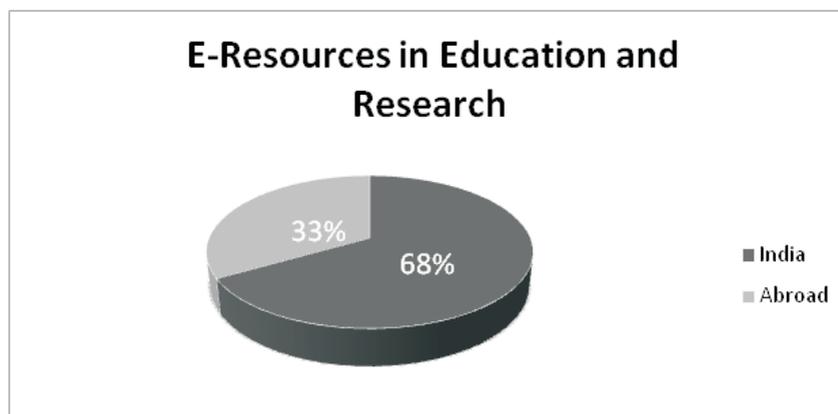
Satish & Jaishree (2000) undertook Ph.D. work on the growing importance and use of internet for information research and services. Akintomine & Ademodi (2013), Aquil & Ahmad (2011), Rubina (2010), Ansari (2006), Yusuf (2006), Hanauer (2004), Adikia (2003), Illingworth (2001), Yadav & Bisht (2005), Husain Al-Ansari (2006) studied about the use of internet for the purpose of teaching, learning and Research in higher education, similarly Singh Gagan & Pant Rakesh (2013) organised a study know the use of internet for research and educational activities by research scholars.

Mary Duffy (2000) took a study to explore the internet as a research and dissemination resource. Purcell Kristen, Rainie, Heap, Alan, Buchanan, Judy (2011) explored how teens do research in the digital world. Kumara, Aditya, Murthy Mahadeva and Hydarali (2013) in their study found out the awareness and use of internet facilities by the students of Vidya Vikas Institute of Management Studies in Mysore City while Hong, Ridzuan and Kuek (2003) found student’s attitudes towards the use of the internet for learning at the University of Malaysia Sarawak. Jagboro, K.O. (2003) took up the study on internet usage in Nigerian Universities.

Studies Related to E-resources in Education and Research

Thousands and thousands of e- resources are available on internet on different subjects and in different forms. Therefore, so many studies have been conducted in India and abroad to discover what is useful and necessary from this vast ocean of knowledge, so that stakeholders can avail the maximum benefits and recourses at the minimum loss of time and money. There are 27 studies that have tried to explore the ‘E-Resources in Education and Research’. It is found that 18 (68%) studies from India and 9 (33%) studies from abroad have been reviewed with respect to ‘ICT and Education’ as shown in the following pie chart-

Graph 4: Matrix of Studies Related to E-Resources in Education and Research



Jose (2014), Sohail and Alvi (2014), Ekta (2014), Rajni and Praveen (2011), Madhusudan (2010), Roopshree (2006), Egberongbe (2011), Thanuskodi (2010), Togia and Tsigilis (2010), Renwick (2005), Kalpana and Sahu (2006), Lohar and Roopshree (2006) studied about the scholarly use of electronic resources in different streams, i.e. Education, Medical, Social Science, Mathematics, Geography, Library Science etc. while Geeta (2013), Jaya (2010), Radha (2012) and Roshan (2008) evaluated the availability of electronic resources on internet in the field of Education, Medical Science, Biology and Mathematics.

In the same vein Eric (2006), Lissa, Barbara& Pamela (2005) evaluated the content quality, usability and readability of information available on websites while Ashok, Saravanan and Balasubramani (2008) analysed the attitude of university students towards electronic information resources.

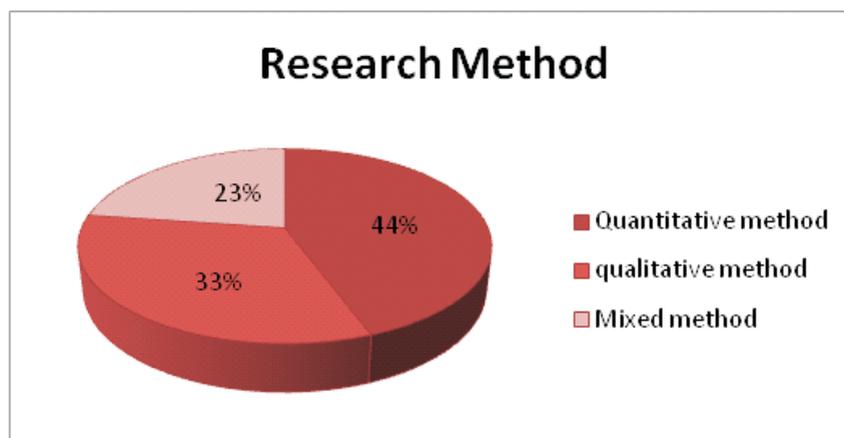
Sharma Chetan (2007), Santhi, L., Radhakrishnan, N. and Swaroop Rani (2011), Shukla Praveen, Mishra Rajani (2011), S. Reeves and others (2011), Dattatraya T. Kalbande, P.A.Shinde and Ingle R.N (2013), K. Elavazhagan and M.S. Udayakumar (2013), Jamy Jose (2014), M.Sohail and Andleeb Alvi(2014), Bajpai Ekta(2014) explored the use and impact of e-resources by research scholars and faculty members while Paulina Nana Yaa Kwafua and others (2014) assessed the use of electronic resources among administrators and faculty in the university of Cape Coast.

Classification of Research Method

The Majority of the researches can be classified broadly as qualitative, quantitative and of mixed designs which employ both qualitative and quantitative approaches. For this review the research method were classified as qualitative, quantitative, mixed method or other.

It is found that 35 studies followed quantitative method, 26 studies used qualitative method while 18 studies chose mixed method to conduct their studies as shown in pie chart-

Graph 5: Method wise review of the researches



The graph 5 shows that different researchers followed different research procedures according to the nature of the problem selected by them. Among the different methods of research followed, nearly 49% can be classified as Quantitative research, 33% as mixed method studies and 28% as qualitative research method.

In quantitative researches, researchers made use of correlation, factor analysis, regression and prediction, analysis of variance, analysis of covariance, t-test, chi-square test, sign test etc. along with central tendency and dispersion.

In qualitative research mostly the researchers made use of case study, content analysis, observation, frequency and percentage analysis for analysis of data.

Mix method studies were usually descriptive in nature and followed both qualitative as well quantitative methods to conduct their research studies.

Period- wise and Area-wise Distribution of Studies

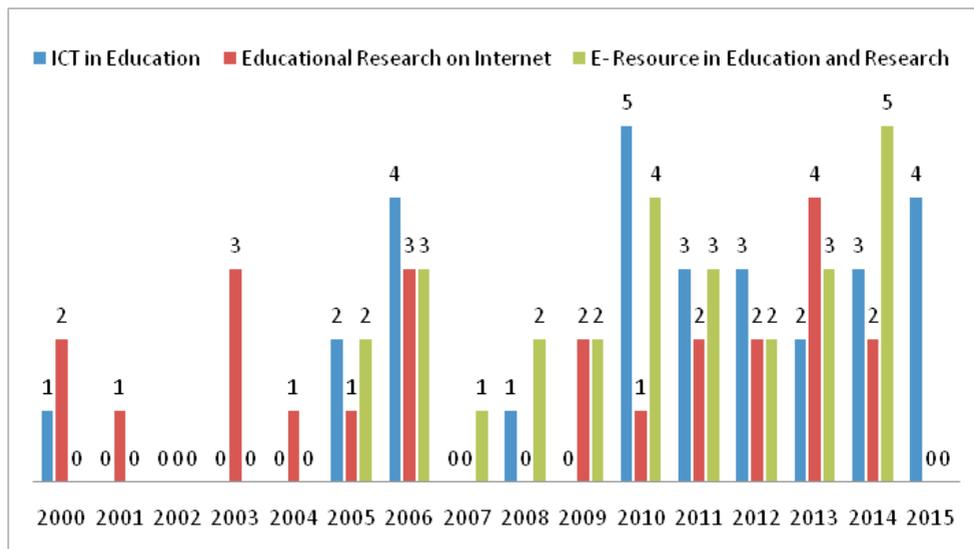
Research studies in this trend report covers the studies carried out in the period of 2000-2015 as shown in table 2-

Table 2: Period- wise and Area-wise Distribution of Studies

Year	ICT in Education	Educational Research on Internet	E- Resource in Education and Research	Total
2000	1	2	-	3
2001	-	1	-	1
2002	-	-	-	-
2003	-	3	-	3
2004	-	1	-	1
2005	2	1	2	5
2006	4	3	3	10
2007	-	-	1	1
2008	1	-	2	3
2009	-	2	2	4
2010	5	1	4	10
2011	3	2	3	8
2012	3	2	2	7
2013	2	4	3	9
2014	3	2	5	10
2015	4	-	-	4
Total	28	24	27	79

The above table revealed that maximum studies (10) have been reported respectively for the period of 2006 and 2014, no study has been found for the period of 2002 while fewer studies have been reported for the period of 2001, 2004 and 2007. It is also visible that maximum studies have been reported in 2006, 2010, 2014 and 2015 in the area of ICT in Education. It is also revealed that in recent years people are taking interest in the area of E-resources in education and research. But it is found that similar type of studies have been conducted in this area if diverge problem will be selected for study the stakeholder will be benefitted more.

Graph 6: Period wise and Area wise Distribution of Researches



Place wise and area wise distribution of studies

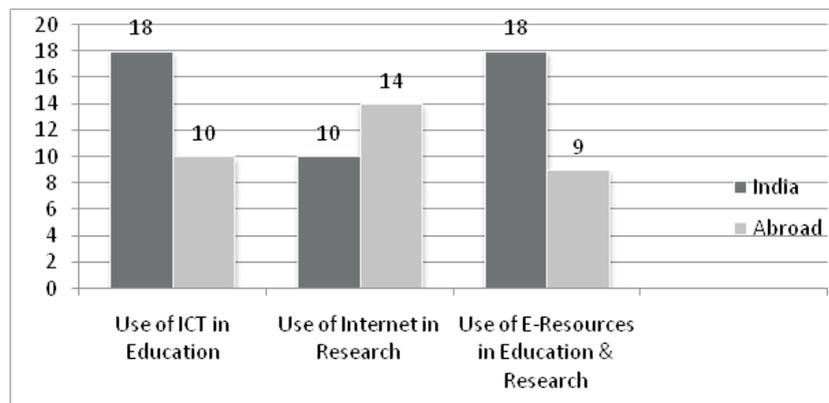
Table 3 shows that out of 79 researches 46 studies have been conducted in India while 33 studies have

been completed in foreign countries. It is clearly visible that more research studies have been completed in India in comparison to foreign.

Table 3 Place wise and area wise distribution of studies

Place	Use of ICT in Education	Use of Internet in Research	Use of E-Resources in Education & Research	Total
India	18	10	18	46
Abroad	10	14	9	33
Total	28	24	27	79

Graph 7: Place wise and area wise distribution of studies



It is clear from the above graph that in India 18 studies have been completed in the area of 'Use of ICT in education', 10 in 'Use of internet in research' and 18 in 'use of e-resources in education and research. While in foreign 10 studies have been completed in the area of 'Use of ICT in education', 14 in 'Use of internet in research' and 9 in 'Use of E-Resources in Education and Research'.

CONCLUSION

In the 21st century no one can exclude or ignore the importance of ICT, internet and e-resources. This trend study shows variety in design and thrust. Looking at the overall bulk of researches in ICT in education, one can evince a sense of satisfaction. The coverage is widespread and comprehensive. Researchers have put labour, efforts and conducted their affairs meticulously. But looking to the quality of researches it can be said that there is enough scope for improvement. The undertaken field of illuminative and in depth phenomenological research studies lie unexplored and needs to be explored more vigorously. The new thrust areas in research are the effectiveness of internet, virtual classroom, virtual teaching, teaching and learning through video conferencing etc.

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