A FACTOR ANALYSIS OF ATTITUDE OF EDUCATION FRATERNITY TOWARDS THE ROLE OF TECHNOLOGY IN EFFECTIVE LEARNING: AN EMPIRICAL STUDY IN HIGHER EDUCATION INSTITUTION

ABSTRACT

Use of Technology is empowering teachers and students, and enhancing teaching and students' achievement which has been highlighted in several studies. Well planned lessons integrating technology are often more engaging, memorable and inspiring to students (Tornabene, 1998). Attitudes refer to one's positive or negative judgment about a concrete subject. Attitude is a major predictor of future use of technology. Student teachers have positive attitude and are highly enthusiastic about interactive whiteboards as an important feature of teaching and learning, and this motivated them to practice using the technology (Kennewell, & Morgan, 2003).

The purpose is to create new opportunities in teaching and learning by integrating computer, multimedia, and network technologies. However, it is not clear whether use of this new technology will automatically result in effective learning or make students dependent on technology to learn. Will Students use Technology appropriately? The same doubts prevailed with the invention of the printing press, radio, and television. All of them have positively contributed in access to information that can be transformed into knowledge and wisdom thereafter. Proper use of technology can become an effective tool to enhance learning. This research is an attempt in understanding the attitude of teachers as well as students towards the role of technology in higher education.

The study is based on primary data collected through a sample size of 130 units consisting of 100 students and 30 teachers from universities located in NCR, India. Factor analysis has been conducted to measure the attitude of the teachers and the students. The study was been conducted in NCR, India and leaves the scope of further research in Higher Education across the globe.

Keywords: *attitude, technology, career advancement, learning facilitator, factor analysis*

INTRODUCTION

Today technology is evolving at a reckless pace. The rate of change is such that one does not get to experience the same aspect of technology twice in couple of years, it becomes obsolete by that time. Within the past decade, Technology has completely changed the ways we learn, interact and virtually 'experience' things. Information and communication technology (ICT) has also brought a paradigm shift in the approach towards learning and education. Teaching and instructional aids today include the use of power point presentations, instructional DVD's, animated motion pictures etc. Govindasamy (2002) and Khan (2000) pointed out that Classroom Technology is the collection of software, hardware and, processes that facilitate learning (and teaching) and thus impact (mostly positively) the learner's attitude and performance. These

technological changes have obligated universities to respond in novel and creative ways that at times defy the traditional perceptions about how education should be delivered.

Ebijuwa (2005) defined ICT as tools used for collection, processing, storage, transmission, and dissemination of information. With advances in ICT, electronic information resources such as electronic books, electronic journals, CD-ROM databases, OPAC, Online databases and the Internet have launched the world into an information age. No institution or organization can still rely on only traditional printed information resource to perform effectively and efficiently. Manochehri and Young (2006) believe that technology facilitates project-based, cooperative, interdisciplinary, and thematic learning. Empowering learning environments with technology give students choice in their learning so that they can solve the problems with ease of correctional and rebuilding methods available through its application. This enables learning to become simpler and improves students' inventive thinking (e.g., problem solving) (Chief Executive Officer (CEO) Forum on Education and Technology, 2001) and makes them independent decision-makers. The power to undo and reconstruct encourages the students and teachers alike in experimenting with the newer aspects of problem solving.

Recent technological advancements have provided educators and learners with new tools to support in-class instruction and coursework. Sandholtz et al. (1997) suggested that the impact of technology on education has the potential to change education in a positive way if done under certain circumstances. Students use technology as a tool to collect, organize, and analyze data; to enhance presentations; to conduct simulations and to solve complex problems. These students began to respond positively to the alternate ways of expressing their knowledge, which not only raises their self-esteem but their status with the teachers and their peers. Hence, learning in digital space can lead to enhanced learning experience largely due to opening up of student's environment (Mun & Hwang, 2003).

Coming on to more humane touch to technology, one requires understanding of basis meaning of Attitude – according to Simpson, Koballa, Oliver, and Crawley (1994), attitudes can be defined as specific feelings that indicate whether a person likes or dislikes something. Teacher attitudes toward technology may be conceptualized as teachers liking or disliking the use of technology. More positive attitudes towards the computer were associated with a higher level of computer experience (Dyck & Smither, 1995; Teo, 2008a). Students' confidence on ICT can be explained through the attitude and behaviors of their teachers. Researchers from different parts of the world believe that the use of ICT tools for educational purposes depends upon the attitudes of teachers toward the technology (Albirini, 2004; Teo, 2008b).

Faculty work and roles within the academy have been reshaped and redefined by the integration of technology into the academic workplace (Baldwin 1998; Schuster and Finkelstein 2006). The study conducted by Sandholtz et al. (1997) on the Apple Classrooms of Tomorrow (ACOT) over a 10-year period shows changes in teacher and student interactions. Teacher peer sharing began to increase as students and teachers sought support from one another. Teachers began teaming and working across disciplines. Teachers and students started to show mastery of technology and started to integrate several kinds of media into lessons or projects. Student provided with technology-rich learning environments 'continued to perform well on standardized tests but were also developing a variety of competencies not usually measured. Negroponte, Resnick, and Cassell (1997) suggested that digital technologies can enable students to become more active and independent learners. The Internet will allow new "knowledge-building communities" in which children and adults from around the globe can collaborate

and learn from each other. Computers will allow students to take charge of their own learning through direct exploration, expression, and experience. This shifts the student's role from "being taught" to "learning" and the teacher's role from "expert" to "collaborator" or "guide".

THE AIM OF THE STUDY

To research the attitudes towards the opportunity to integrate computer, multimedia, and network technologies in teaching and learning.

MATERIALS AND METHODS

Technology offers new ways of teaching and learning and has transformed the approach to student learning. Technology also provides a number of opportunities that would otherwise be difficult to create. Wilson (2001) envisions technology as offering endless possibilities to enhance educational experiences, expand academic opportunities, and develop critical employment skills. The increased ability to communicate with experts enhances students' learning process (Bransford, Brown, & Cocking, 2000). When the learning experience is more relevant to the student, there is an increased level of individual student acceptance of information systems. Independence in learning (i.e., increased efficacy towards self managed and self-directed learning) is likely to occur (Compeaux, Higgins, & Huff, 1999).

Romanov and Nevgi (2007) stated that students who utilized multimedia equipments were more energetic in using e-learning tools and achieved better course performance. Internet is credited with allowing access to a wide range of knowledge, especially as it has become central to scholarly communication through the creation of numerous e-journals and teaching resources (Leong & Hawamdeh, 1999; Koubek & Jandl, 2000; Thelwall, 2002; Rajab & Baqain, 2005). Information and communication technology (ICT) has the potential to facilitate students' learning and improve teaching (Kazu & Yavulzalp, 2008; Kirschner & Woperies, 2003). Sharma (2009) identifies e-resources to include journals, e-mail, research reports, and bibliographic databases. Ibrahim (2004) adds library websites, online catalogues, and online reference works, while Aramide and Bolarinwa (2010), mention A-V resources, instructional audio tapes, instructional video tapes, VCD/DVD, radio, television, multimedia projectors, e-resources-electronic databases, e.g., JSTOR, e-documents, Internet/e-mail facility, CD-ROMS, computers, telephone facility (GSM/Landline), VSAT, printers, and digital cameras. Omotayo (2010), Thanuskodi (2010), Sharma (2009), Borrego (2007), and Ibrahim (2004) have all reported that e-journals are the most used among the arrays of available electronic resources. Tenopir (2003) analyzed that electronic resources have been rapidly adopted in academic spheres, though the behavior varies according to the discipline. Zakaria, Watson & Edwards (2010) conducted their research on the use of Web 2.0 technology by Malaysian students. Result showed that students preferred using e-mail to disseminate and share digital contents. Similarly it was also found that for finding information related to education, students prefer to use search engines instead of asking friends or teachers. Use of technology as transformation has the potential to provide innovative educational opportunities (Hughes, 2005) by reorganizing students' cognitive processes and problem solving activities (Pea, 1985).

According to Hughes (2005), teachers need to have a technology-supported-pedagogy knowledge and skills base, which they can draw upon when planning to integrate technology into their teaching. Zhao, Pugh, Sheldon and Byers (2002) suggested "...teachers need to know the affordances and constraints of various technologies and how specific technologies might support their own teaching practices and curricular goals. They also need to know how to use technologies".

Coming to the deceiving part of technology, Plagiarism has always existed in education, including higher education, where it is one of the major forms of academic dishonesty.

Assignments handed in by students may turn out to be copied from fellow students or to be taken over, in part or in whole, from existing published works. In a way, computers and the Internet only add to the means that students have at their disposal to commit plagiarism. However, they make it much easier to do and much harder to detect. As Austin and Brown (1999) have argued, plagiarism has become easier for students in two ways: “word processing programs allow students to easily “cut and paste” information from the Internet or other electronic media to develop a paper that appears to be original work” and “students’ use of Internet information that may be unavailable in traditional sources makes documenting academic dishonesty more difficult to faculty.” (Hinman,2002).

According to research by Patricia Greenfield (2009), UCLA distinguished professor of psychology and director of the Children’s Digital Media Center, Los Angeles, Technology has played a bigger role in our lives but our skills in critical thinking and analysis have declined, while our visual skills have improved. As students spend more time with visual media and less time with print so they process information better. Most visual media are real-time media that do not allow time for reflection, analysis or imagination. Reading develops imagination, induction, reflection and critical thinking, as well as vocabulary but students today have more visual literacy and less print literacy. Although technology is not a panacea for all educational ills, technology is an essential tool for teaching.

Data collection and Methodology

In this study, two separate questionnaires were administered on the survey participants. Hence for the purpose of data collection, questionnaires were distributed among 125 students and 42 teachers from universities situated at NCR (National Capital Region), India using simple random sampling. Due to non-responsive error, total 130 (100 students and 30 teachers) responses were taken into consideration for further analysis.

Table 1. Taxonomy of survey indicators for Students

Categories	Survey Item	Survey Statements for Students	References
Technological facility	TF 1	I have phobia for ICT	Yusuf & Balogun (2011)
	TF 2	Using technologies is stress busting.	Tabata & Johnsrud (2008)
	TF 3	The use of ICT improves the quality of communication between faculty and students.	Yusuf & Balogun (2011)
	TF 4	My self-image is enhanced by using technological innovations.	Tabata & Johnsrud (2008)
	TF5	Internet gives me flexibility to gather information at my convenience.	Lowther et al. (2003), Sclater et al. (2006)
	TF 6	Through internet I can get access to variety of learning resources.	Lowther et al. (2003), Sclater et al. (2006)
	TF 7	I have the accessibility to seek information using search engines.	Lowther et al. (2003), Sclater et al. (2006)
	TF 8	I can gather information online if I happen to miss lectures.	Zakaria et al. (2010)
	TF 9	I prefer to submit/take homework and assignments in electronic form.	Austin & Brown (1999)
	TF 10	It’s easier to edit the assignments.	Austin & Brown (1999)
	TF 11	It’s easy to access information through online/virtual library than actual/real library.	Rajab& Baqain (2005)
	TF 12	Internet gives me the facility to get connected to Experts.	Bransford, Brown, & Cocking(2000)

Role of Technology Effective Learning	RE 1	Technology is producing decline in critical thinking and analysis.	Greenfield (2009)
	RE 2	Technology has lead to decline in deeper understanding of information.	Greenfield (2009)
	RE 3	Technology in education enhances student's learning.	Yusuf & Balogun (2011)
	RE 4	ICT gives opportunity to learn more.	Yusuf & Balogun (2011)
	RE 5	Technology in education has made the course more interesting.	Yusuf & Balogun (2011)
	RE 6	The use of educational technologies provides richer educational experience.	Yusuf & Balogun (2011)
	RE 7	ICT increases instructional proficiency.	Yusuf & Balogun (2011)
	RE 8	Technology has the potential to provide innovative educational opportunities.	Hughes (2005)
	RE 9	Information gathered from Internet is Authentic.	Lowther et al. (2003), Sclater et al. (2006)
	RE 10	It is important to use new multimedia technologies to describe projects.	Romanov & Nevgi (2007)
	RE 11	Use of new multimedia technology is essential for quality education.	Romanov & Nevgi (2007)
	RE 12	I learn more from ICT than I do from books.	Yusuf & Balogun (2011)
	RE 13	Information gathered from internet is up to date.	Lowther et al. (2003), Sclater et al. (2006)

Factor Analysis

To find out the underlying structure of the data, factor analysis has been used. This has helped in finding out the important factors in terms of attitude towards role of technology in education and its usefulness in effective learning. Factor analysis has been separately applied for teachers' data and students' data.

Factor Analysis of technological facility for Students

Before applying the factor analysis, KMO and Bartlett test has been used to see the suitability of factor analysis for the data. A higher value of the test (.610) justifies the use of factor analysis.

Table 3 explains the total variance of the factors. The attribute have been divided into five factors as their Eigen value are greater than 1. The factors having Eigen values less than 1 have been ignored. The total variance explained by these four factors is 88.195 which is quite significant, thus it meets the requirement for the number of factors and their contribution rate as the criterion for variance analysis is that the total contribution rate should reach at least 80% (Chen, 2008).

Table 4 represents the rotated factor matrix which explains the correlation between the attributes and the related factor. The attributes have been divided into five factors based on their correlation values and hence each factor consists of those attributes having correlation greater than .65 (Wang, 2010). Factor 1 consists of flexibility, variety and easy accessibility. Factor 2 consists of using search engine, using online information and editing e-assignments. Factor 3 consists of connectivity to Experts. Factor 4 consists of enhanced self image, e-submissions and stress busting. Factor 5 consists of improved communication. Based on the attributes relating to the factors, the five factors have been named as Internet resourcefulness, Internet usefulness, Connectivity to Experts, Personal enrichment and Enhanced communication respectively.

Table 2. Taxonomy of survey indicators for Teachers

Categories	Survey Items	Survey Statements for Teachers	
Career Advancement	CA 1	Using technology has good impact on my career.	Tabata & Johnsrud (2008)
	CA 2	I have phobia for ICT.	Yusuf & Balogun (2011)
	CA 3	Using technologies is stress busting.	Tabata & Johnsrud (2008)
	CA 4	Technology is important for conducting professional work.	Tabata & Johnsrud (2008)
	CA 5	Resources are available to support technology needs.	Tabata & Johnsrud (2008)
	CA 6	Institution recognizes those who use technology.	Tabata & Johnsrud (2008)
	CA 7	The use of ICT improves the quality of communication between faculty and students.	Yusuf & Balogun (2011)
	CA 8	My self-image is enhanced by using technological innovations.	Tabata & Johnsrud (2008)
	CA 9	Technology has the potential to provide innovative educational opportunities.	Hughes (2005)
	CA 10	The good use of educational technologies should be recognized and reimbursed by the Institution.	Finley & Hartman(2004)
Technology for Effective Learning	TL 1	Students have become less attentive in class since everything is available online.	Experts Opinion
	TL 2	Technology is producing decline in critical thinking and analysis.	Greenfield (2009)
	TL 3	Plagiarism has increased since it's easier to edit the assignments.	Austin & Brown (1999)
	TL 4	Discipline is hampered with the use of technology.	Experts Opinion
	TL 5	ICT increases instructional proficiency.	Yusuf & Balogun (2011)
	TL 6	Information gathered from Internet is Authentic.	Lowther et al. (2003), Sclater et al. (2006)
	TL 7	Through internet I can get access to variety of learning resources.	Lowther et al. (2003), Sclater et al. (2006)
	TL 8	I prefer to seek information using search engines (e.g., Google).	Lowther et al. (2003), Sclater et al. (2006)
	TL 9	I prefer collecting homework and assignments in electronic form.	Experts Opinion
	TL 10	Use of new multimedia technology is essential for quality education.	Romanov & Nevgi (2007)
	TL 11	It's easy to access information through online/virtual library than actual/real library.	Rajab & Baqain (2005)
	TL 12	Information gathered from internet is up to date.	Lowther et al. (2003), Sclater et al. (2006)
	TL 13	My teaching pedagogy has been positively transformed due to technology support.	Hughes (2005)

Table 3. The variance contribution and contribution rate of dominant component factor

Component	Variance Contribution	Contribution Rate (%)	Accumulated Contribution Rate (%)
1	3.185	23.225	23.225
2	2.695	20.413	43.638
3	2.454	17.220	60.858
4	1.923	15.023	75.881
5	1.735	12.314	88.195

Table 4. Rotated Component Matrix^a

Statements	Component				
	1	2	3	4	5
6 The use of ICT improves the quality of communication between faculty and students.	.030	.012	.107	.042	.920
7 My self-image is enhanced by using technological innovations.	.426	.015	-.113	.692	.097
9 Internet gives me flexibility to gather information at my convenience.	.745	-.071	.029	-.080	.080
11 Through internet I can get access to variety of learning resources.	.606	.418	-.338	.189	-.064
12 I have the accessibility to seek information using search engines.	.391	.729	-.054	-.132	.110
14 I can gather information online if I happen to miss lectures.	-.181	.563	.438	.062	-.126
15 I prefer to submit/take homework and assignments in electronic form.	-.159	-.001	.411	.632	-.335
18 It's easier to edit the assignments.	-.035	.750	.120	.155	.024
19 Its easy to access information through online/virtual library than actual/real library.	.575	.192	.482	.100	-.076
21 Internet gives me the facility to get connected to Experts.	.048	.093	.821	-.056	.147
22 Using technologies is stress busting.	-.366	.245	-.172	.585	.316

Factor Analysis of Effective Learning through technology for Students

Before applying the factor analysis, KMO and Bartlett test has been used to see the suitability of factor analysis for the data. A higher value of the test (.621) justifies the use of Factor analysis.

Table 5 explains the total variance of the factors. The attribute have been divided into four factors as their Eigen value are greater than 1. The factors having Eigen values less than 1 have been ignored. The total variance explained by these four factors is 87.506 which is quite significant.

Table 5. The Variance contribution and contribution rate of dominant component factor

Component	Variance contribution	Contribution rate	Accumulated contribution rate (%)
1	3.170	25.997	25.997
2	2.734	23.764	49.761
3	1.999	20.536	70.297
4	1.453	17.209	87.506

Table 6 represents the rotated factor matrix which explains the correlation between the attributes and the related factor. The attributes have been into four factors based on their correlation values and hence each factor consists of those attributes having correlation greater than .65. Factor 1 consists of enhanced learning, more opportunity, interesting and innovative. Factor 2 consists of instructional proficiency, authentic and up to date information. Factor 3 consists of better than books and richer experience. Factor 4 consists of describing projects and quality education. Based on the attributes relating to the factors, the four factors have been named as Enriched Learning, Learning Expertise, Superior Learning and Learning with Multimedia respectively.

Table 6. Rotated Component Matrix^a

Statements	Component			
	1	2	3	4
1 Technology in education enhances student's learning.	.751	-.188	.129	.186
2 ICT gives opportunity to learn more.	.660	.343	-.200	.051
3 Technology in education has made the course more interesting.	.580	.293	.098	-.111
4 The use of educational technologies provides richer educational experience.	.130	.097	.469	.144
5 ICT increases instructional proficiency.	.351	.553	.143	.138
8 Technology has the potential to provide innovative educational opportunities.	.606	-.033	.439	-.058
10 Information gathered from Internet is Authentic.	-.082	.808	-.097	.243
16 It is important to use new multimedia technologies to describe projects.	.049	.162	.467	.698
17 Use of new multimedia technology is essential for quality education.	.024	.131	-.021	.901
24 I learn more from ICT than I do from books.	-.003	.029	.817	.026
25 Information gathered from internet is up to date.	.128	.693	.451	-.042

Factor Analysis of Technological facility in Effective Teaching for Teachers

Before applying the factor analysis KMO and Bartlett test has been used to see the suitability of factor analysis for the data. A higher value of the test (.600) justifies the use of Factor analysis.

Table 7 explains the total variance of the factors. The attribute have been divided into four factors as their Eigen value are greater than 1. The factors having Eigen values less than 1 have been ignored. The Total Variance explained by these four factors is 89.56 which is quite significant.

Table 7. The Variance contribution and contribution rate of dominant component factor

Component	Variance Contribution	Contribution rate (%)	Accumulated contribution rate (%)
1	3.139	27.766	27.766
2	2.860	23.668	51.434
3	1.998	20.083	71.517
4	1.734	18.043	89.560

Table 8 represents the rotated factor matrix which explains the correlation between the attributes and the related factor. The attributes have been into four factors based on their correlation values and hence each factor consists of those attributes having correlation greater than .65. Factor 1 consists of variety of resources, accessibility to search engines and multimedia technology. Factor 2 consists of increased instructional proficiency and accessibility to virtual library. Factor 3 consists of authentic and up to date information. Factor 4 consists of collect e-assignments and teaching pedagogy. Based on the attributes relating to the factors, the four factors have been named as Internet Versatility, Teaching Proficiency, Internet Efficacy and Teaching Style respectively.

Table 8. Rotated Component Matrix^a

	Component			
	1	2	3	4
31 ICT increases instructional proficiency.	.121	.909	.221	-.015
36 Information gathered from Internet is Authentic.	.086	.072	.907	.058
37 Through internet I can get access to variety of learning resources.	.834	.276	-.018	-.030
38 I prefer to seek information using search engines (e.g. Google).	.857	-.063	.098	.154
41 I prefer collecting homework and assignments in electronic form.	-.010	.010	.357	.843
43 Use of new multimedia technology is essential for quality education.	.721	.001	.252	.186
45 Its easy to access information through online/virtual library than actual/real library.	.007	.865	.061	.171
47 Information gathered from internet is up to date.	.265	.408	.737	.234
48 My teaching Pedagogy has been positively transformed due to technology support.	.309	.184	-.087	.823

Factor Analysis of Technological facility in Career Advancement for Teachers

Before applying the factor analysis KMO and Bartlett test has been used to see the suitability of factor analysis for the data. A higher value of the test (.560) justifies the use of Factor analysis.

Table 9. explains the total variance of the factors. The attribute have been divided into four factors as their Eigen value are greater than 1. The factors having Eigen values less than 1 have been ignored. The Total Variance explained by these four factors is 87.755 which is quite significant.

Table 9. The Variance contribution and contribution rate of dominant component factor

Component	Variance Contribution	Contribution Rate (%)	Accumulated contribution Rate (%)
1	3.020	26.753	26.753
2	2.761	25.014	51.767
3	2.027	19.586	71.353
4	1.732	16.402	87.755

Table 10 represents the rotated factor matrix which explains the correlation between the attributes and the related factor. The attributes have been into five factors based on their correlation values and hence each factor consists of those attributes having correlation greater than .65. Factor 1 consists of improved communication and innovative opportunities. Factor 2 consists of professional importance, enhanced self image and availability of resources. Factor 3 consists of impact on career and reimbursement. Factor 4 consists of recognition for using technology. Based on the attributes relating to the factors, the four factors have been named as Career Potential, Professional Significance, Professional Appreciation and Professional Recognition respectively.

Table 10. Rotated Component Matrix^a

	Component			
	1	2	3	4
27 Technology is important for conducting professional work.	.470	.671	.048	-.297
28 Resources are available to support technology needs.	.140	.791	.142	.172
29 Institution recognizes those who use technology.	.024	.174	.040	.922
32 The use of ICT improves the quality of communication between faculty and students.	.761	.115	.058	-.042
33 My self-image is enhanced by using technological innovations.	-.123	.798	-.256	.217
34 Technology has the potential to provide innovative educational opportunities.	.872	.026	-.041	.117
35 The good use of educational technologies should be recognized and reimbursed by the Institution.	.272	.021	.826	.285
30 Using technology has good impact on my career.	-.388	-.072	.742	-.349

CONCLUSION AND RESEARCH IMPLICATIONS

Thus from this study, the factors obtained for ICT facility to Students are Internet resourcefulness, Internet usefulness, Connectivity to Experts, Personal enrichment and Enhanced communication which indicates that students have an inclination for high tech equipments which eases their endeavor. Enriched Learning, Learning Expertise, Superior Learning and Learning with Multimedia factors were deducted for effective learning experience for students which shows that students find ICT as a useful tool in order to enhance their learning process. For career advancement of teachers, factors obtained were Career Potential, Professional Significance, Professional Appreciation and Professional Recognition and for effective teaching experience, Internet Versatility, Teaching Proficiency, Internet Efficacy and Teaching Style factors were deducted. Teachers also find use of technology supportive in their career enhancement and in effective teaching.

Hence, it can be concluded on the basis of the above mentioned factors that the communication between the students and teachers might improve with use of ICT. With Educational technologies, students might find their learning enriched and performances enhanced. Teachers might also find use of technology professionally significant and proficient. Teachers might observe change in their teaching pedagogy. These conclusions can further be hypothesized for future researches.

This research throws light and captures the essence of effective use of technology in enhanced learning. Preparing students for real life in our technological and diverse world require the universities to make the teachers and students realize that role of technology can play in their effective learning process. This would encourage both to embrace emerging technology to enhance the scope of the learning in the limited time period of their course work. Through factor analysis, this paper has been able to provide real insights into the important factors for effective learning with the use of technology. Capturing and imbibing of the images through the use of ICT for faster and retentive learning may further encourage the educationists to include wider topics in the scope of learning that were otherwise considered beyond scope for the given learning stage. This may bring about a change in the scope and level of educational courses that can be considered with respect to time limitations. The universities can focus on the important factors in their curriculum.

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