Usage of Information and Communication Technology among Public and Private Sector University Faculty

Hafsa Ahmed[*] & Fauzia Kurshid[**]

Abstract

The main objectives of the research were to measure the usage of information and communication technology (ICT) among the public and private sector university faculty, to measure the awareness of private and public sector university faculty about usage of ICT in the teaching and learning process and to explore the role of faculty demographic variations in determining their usage of ICT. Population of this study was comprised of faculty working in the public and private sector universities of Rawalpindi/Islamabad. A stratified random sample of 52 male and 48 female university faculty members was collected from 3 public and 3 private universities. A 30 items research questionnaire was used to collect data; it was analyzed with the help of SPSS 18 by using various statistics like Mean, SD, Correlation and ANOVA. Research findings revealed a significant difference in the awareness of public and private sector faculty in regards to the use of ICT. The results portray gender differences in the usage of ICTs; male faculty members use ICT more in the teaching learning process than female faculty members. Professors were among most common ICT users than Assistant Professors and Lecturers. The study would be beneficial for the university faculty in order to create realization of the usage of ICT in the teaching and learning environment. For the advancement of knowledge, proper utilization of ICT tools and services are extremely important therefore, teachers, education planners and curriculum developers take inspiration from the finding of the study.

---

* Research Scholar
**Visiting Professor, Department of Applied Psychology and Education, NUML.
Email: dr_f_khurshid@yahoo.com

Introduction

Education is a driving strength of social and economic development of the nation. Education is a key pillar of society, during the last two decades, the paradigm shift from customary based education towards the modern, innovative, technical and dynamic learning; which gives more emphasis of the use of ICT. With recent development of science and technology, accessibility and quality of education is concentrated around learners' competences and abilities to handle huge volumes of information.

In the 21st century, ICT is measured as keystone of education platform. It is an electronic highway that presents a digital ocean in all the aspects of the teaching and learning process which helps to improve the productivity of the educational venture. ICT is an abbreviation of Information and Communication Technology, it is a generic term which refers to computers and computing oriented tasks. ICT is both need and opportunity in educational hub and playing a significant role in each and every level of teaching learning process (Aduke, 2008; Ekundayo, 2009). University education has core value; excellence of education in universities has been outfitted with usage of ICT by innovative faculty.

The expansion of ICT has abruptly remodel the teaching and learning process in higher education sector. ICT is an umbrella term for teaching and learning purposes that incorporates communication tools and technological services encircling: LEDs, smart phones, hardware, software, computer network and satellite etc which can use to improve and sustain learning in modern way. Consequently, ICT is measured through the application of modern digital tools in all aspects of education. ICT serves as an electronic highway for automated devices which facilitates the progression of scientific based learning and share information (Ofodu, 2007). ICT is considered as utilization of e-learning to improve and expand teaching and learning process (Yusuf, 2005). ICT is a vital teaching and learning tool which can assist learners to get education through online teaching as well (Pulkkinen, 2007; Wood, 1995).

ICT plays an imperative role in supplementing teachers towards practical application of teaching and learning in the classrooms environment. With the massive use of ICT in recent time, the use of computers has emerged at all levels of the educational setup. Teachers are the fundamental vehicle of change in education so improvement of teachers is determined by the quality and flexibility of using the ICT techniques. ICT enhances the flexibility on delivery of education so that the learner

can access the information. ICT acts as a socializing agent that provides an interactive teaching and learning environment to educators. The higher education around the world has progressively approves ICT as modern apparatus for education, teaching, curriculum, employees' improvement, and learners' knowledge (Kumpulainen, 2007; Usluel, Askar, & Bas, 2008).

The development of science and technology has opened an electronic gateway for tremendous growth in the field of education. Computers, internet, multimedia and education technology have great effect on teaching and learning process. Computer in education means putting information in one computer where other can see through internet. Due to growing application of ICT that there is change from traditional technology of chalk and talk method of teaching and learning process to individualized through use of modern education learning

According to Daniels (2002) ICTs have become a bridge between learner and content in modern society within short time around the world. Now a day, countries accepting the usage of ICT in higher institutes and mastering the fundamental proficiencies and expertise of ICT as integral part of education process, along with basic literacy of numeracy and manipulation. While, ICT has to be acknowledged and used productively by its researchers in research field on scrutinizing problem and correlated to the attitude toward ICT has develop into one of the most innovative asset (Venkatesh, Morris, Davis, & Davis, 2003).

ICTs have potentialities to innovate, accelerate, improve, intensify competences in order to engage learners moreover it can assist learners to relate learning practices with vocation experiences, generates financial capability for tomorrow's personnel, along with strengthening education and serving progression in teaching (Davis and Tearle,1999). ICT have practical application in the higher educational institutions of Pakistan. It is desired that all universities and higher education institution must be well equipped with ICT tools and faculty should be able to use the technology, tools, and services in teaching learning process.

Statement of the Problem

The present study was designed to explore the usage of ICT by public and private universities in the teaching and learning process. It further aims to investigate the role of faculty demographic variation of qualification, experience, gender and sector in their effective usage of ICT in the classroom situation.

Objectives

Following were the objectives of the study:

1. To measure the use of ICT among the public and private sector university faculty.
2. To measure the awareness of private and public sector university faculty about use of ICT in the teaching learning process.
3. To explore the role of faculty demographic variation in determining their use of ICT in teaching learning process.

Hypotheses

The following hypotheses were formulated:

1. There is significant difference in the awareness of public and private sector university faculty about the usage of ICT in the teaching learning process.
2. Male faculty members use ICT more in teaching learning process than female faculty members.
3. Younger university faculty members use ICT more than older ones in teaching learning process.
4. Professors use ICT more frequently in the teaching learning process than faculty working in other position.
5. Faculty having M. Phil degrees uses ICT more in teaching learning process than Master and PhD degree holders.
6. University faculty with more work experience use ICT more frequently in teaching learning process than faculty with less experience.
7. Faculty with higher knowledge of computer hardware (Advance computer users)and software use more ICT in teaching learning process than faculty with less knowledge of computer hardware and software (basic and intermediate users).

Population

The ideal population for the research was all male and female faculty members of public and private universities of Rawalpindi and Islamabad. Due to scarcity of time and resources, only six universities were selected from Rawalpindi and Islamabad.

Sample

A stratified random sample of 100 males and females university faculty members was collected from six universities (three from public sector universities, three from private sector universities) of Islamabad and Rawalpindi. Universities from which sample was taken, namely, International Islamic University of Islamabad, Fatima Jinnah Women University, National University of Modern Languages, Foundation University , the university of Lahore, Islamabad Campus and Ripah International. Respondents' ages ranged from 24 years to 45 years, Qualification ranges from Master to Doctorate, their work experience ranges from 1 year to more than twenty years. Data was collected from social sciences and management science departments.

Research Instrument

The research instrument used for collection of data was questionnaire. For the measurement, ICT questionnaire developed by S. D. Eyono Obono (2009) was used in the research study. ICT questionnaire comprised of 30 items pertaining to five subscales which were helpful in measuring the use of ICT among public and private sector universities in the teaching and learning process.

Name of the subscales of ICT were ICT Awareness (ICTA), ICT Adoption (ICTA), ICT Perceived Usefulness (PU), ICT Ease of Use (ICTEOU) and Teacher attitude toward ICT (TAICT). The respondents gave their opinions/responses and according to their agreement and disagreement with following five response categories (strongly disagree 1, disagree 2, neutral 3, agree 4, and strongly agree 5).

Data Collection

For the present study data were collected through personal visits, faculty was approached formally in their job setting, after their willingness; they were requested to fill out the questionnaire honestly and according to their agreement and disagreement. They were given as much time as they needed to fill out the questionnaire. The assurance of confidentiality and secrecy was provided to them that information collected by them would be kept off the record and would only be used for research.

Results

The study was designed to explore the use of ICT among public and private sector universities in teaching and learning process. The research was carried out on the sample of 100 males and females university faculty of public and private universities in Rawalpindi and Islamabad. In order to test the Hypotheses, data was analyzed by using various statistics to arrive to conclusions such as Means, Standard Deviation, Correlation, and ANOVA.

Reliability of ICT questionnaire was calculated through method of split half reliability by dividing test into two parts (15 items in Part 1 and 15 items in Part 2).The reliability of part 1 was 0.732 and the reliability of part 2 was 0.713 where as between forms correlation was 0.781. It reveals that instrument has desirable internally consistency to measure the ICT usage among university faculty.

Table 1
Inter- Scales Correlations of ICT with its Subscales and Total scale (N=100)

Subscales	1	2	3	4	5
ICT Awareness	1				
ICT Adoption	0.386**	1			
ICT Perceived Usefulness	0.397**	0.557**	1		
ICT Ease of Use	0.588**	0.454**	0.385**	1	
Teachers' attitude towards ITC	0.557**	0.451**	0.251*	0.547**	1
Total	0.789**	0.737**	0.667**	0.800**	0.765**

Table 1 show inter-scales correlation of university faculty members' scores on ICT questionnaire with total and its subscales. From the results in table, it appears that there is a strong positive correlation between subscales of ICT and total scale. The highest correlation exists between ICT Perceived Usefulness and Teacher Attitude toward ICT is 0.588 and lowest correlation exists between ICT Ease of Use and ICT Adoption. The correlation ranges from 0.667** to 0.800**.The highest correlation among all is between total ICT questionnaire and ICT Ease of use (ICTEOU) which is 0.800[**].

Table 2

Comparison of Mean and Standard Deviation of University faculty scores on ICT for variable "Gender" (N=100)

Subscales of ICT	Gender			
	Female (n= 48)		Male (n=52)	
	M	SD	M	SD
ICT Awareness	23.00	2.79	23.87	2.94
ICT Adoption	23.17	2.69	23.10	3.31
ICT PU	23.51	3.31	24.15	3.40
ICTEOU	22.71	3.30	24.73	3.56
TAICT	22.80	3.08	24.31	3.44
Total	115.19	15.17	120.16	16.65

Table 2 portrays gender wise comparison of university faculty scores on ICT. It explains that male university faculty members are more frequently ICT usage in teaching leaning process as compared to female university faculty. The result further illustrates that male university faculty have higher score on the factor ICT perceived Ease of Use and Teacher Attitude towards ICT. (Male M=120.16 Female M=115.19).

Table 3

One way Analysis of variance of Faculty scores on ICT for the variable Gender

ANOVA of ICT	df	Mean Squares	F	Sig
Between Groups	1	598.663	4.187	0.04
ICT Adoption	98	142.96		
Total	99			

P<0.05**

Table 3 indicates that there is a significant difference between the responses of university faculty members belonging to both genders on ICT. The value of F ratio is 4.187 and level of significance is 0.04 which is less than 0.05.

Table 4

Comparison of Mean and Standard Deviation of University faculty scores on ICT for variable "Age" *(N=100)*

	Age					
	20-30 yrs (n= 36)		31-40 yrs (n=39)		>40 yrs (n=25)	
	M	SD	M	SD	M	SD
ICT Awareness	23.51	2.90	23.61	2.86	21.87	2.74
ICT Adoption	23.30	3.20	23.23	2.63	21.62	3.15
ICTPU	23.91	3.03	22.02	2.00	21.25	2.49
ICTEOU	24.06	3.37	23.69	3.57	21.12	2.16
TAICT	23.58	3.54	23.77	3.17	23.38	2.61
Total	118.36	16.04	116.32	14.23	109.24	13.15

Table 4 shows gender comparison of university faculty scores on ICT. It further elaborates that the use of ICT is higher among young university faculty members as compared to other age groups. The result further reveals that university faculty belongs to age group 20-30 years have higher score on the ICTP Ease of Use and ICT perceived Usefulness. The mean scores university faculty at age 20-30 is 118.36 while 31-40 is 116.32 and age more than 40 is 109.24.

Table 5

One way Analysis of variance of Faculty scores on ICT for the variable Age

Source	df	Mean Squares	F	Sig
Between Groups	2	304.602	6.118	.003
Within Groups	97	75.679		
Total	99			

Table 5 indicates that there is significant difference between the responses of university faculty members belonging to various age groups on ICT. The value of F is 6.118 and level of significance is 0.003 which is less than 0.05.

Table 6

Comparison of Mean and Standard Deviation of University faculty scores on ICT for variable "Designation" (N=100)

Subscales of ICT	Designation					
	Lecturers (n= 42)		Assistant Professors (n=22)		Professors (n=36)	
	M	SD	M	SD	M	SD
ICT Awareness	24.04	3.80	22.90	2.65	23.22	3.52
ICT Adoption	23.40	2.92	22.41	3.33	24.44	4.01
ICTPU	23.48	3.72	24.36	3.99	23.22	3.52
ICTEOU	23.65	3.41	23.77	3.02	24.22	3.41
TAICT	23.50	3.72	23.73	3.91	24.09	3.89
Total	118.07	17.57	117.17	16.9	119.19	18.35

Table 6 indicates designation wise comparison of university faculty on ICT. The table shows that Professors are higher user of ICT as compared with Assistant professors and Lecturers. Yet, there was slight difference between the values at each level of designations. The results further reveal that Professors have higher scores on the ICT Adoption and ICTEOU while lecturers have more ICT Awareness and Assistant professors have higher score on ICT Perceived Usefulness. The means score of Lecturers is 118.07, Assistant Professors is 117.17 and Professors is 119.19.

Table 7

Comparison of Mean and Standard Deviation of University faculty scores on ICT for variable "Qualification" (N=100)

Subscales of ICT	Qualification					
	Master (n= 29)		M Phil/MS (n=58)		PhD (n=13)	
	M	SD	M	SD	M	SD
ICT Awareness	23.24	2.24	23.74	3.07	22.38	3.17
ICT Adoption	22.76	3.39	23.36	2.72	23.00	3.31
ICTPU	23.45	2.40	24.13	3.76	23.23	3.29
ICTEOU	24.03	3.08	23.89	3.79	21.92	2.17
TAICT	22.96	3.39	23.96	3.39	23.07	2.75
Total	116.44	14.5	119.08	17.36	113.6	14.69

Table 7 shows comparison of university faculty scores of ICT on the variable qualification. The results that are obtained from computation indicates that the university faculty members having MS/M Phil are more frequent user of ICT as compared to faculty with other qualification levels. It further portrays that M Phil/MS qualified university faculty members have higher scores on the ICT Ease of Use and Teacher attitude towards ICT. The mean scores for university faculty having Master degree have Mean score of 116.44 while for M Phil/MS are having mean score of 119.08 and PhD is 113.6.

Table 8

Comparison of Mean and Standard Deviation of University faculty scores on ICT for variable "Experience" (N=100)

Subscales of ICT	Experience					
	1-10 yrs (n= 50)		11-20 yrs (n=26)		>20 yr (n=24)	
	M	SD	M	SD	M	SD
ICT Awareness	23.84	2.81	22.80	2.96	24.22	**3.50**
ICT Adoption	23.43	3.10	22.53	2.98	24.67	3.89
ICTPU	23.82	3.28	23.69	3.78	23.78	2.86
ICTEOU	24.14	3.67	22.76	3.21	24.00	3.60
TAICT	23.58	3.68	23.53	2.58	23.44	2.92
Total	118.84	16.54	115.31	15.51	120.11	16.77

Table 8 shows experience wise comparison of university faculty on ICT. The result shows that the university faculty members with more experience has higher use of ICT in teaching learning process as compared with the less work experience. It further reveals that faculty members having experience more than 20 years have higher scores on the ICT Adoption and ICT Awareness. The mean scores of faculty members having experience of 1-10 years is 116.84, while the mean scores for 11-20 years is 115.31 and more than 20 years is 120.11.

Table 9

Comparison of Mean and Standard Deviation of University faculty scores on ICT for variable "Sector" (N=100)

Subscales of ICT	Sector			
	Public (n= 50)		Private (n=50)	
	M	SD	M	SD
ICT Awareness	24.64	2.58	**22.20**	2.65
ICT Adoption	24.38	2.53	21.90	1.91
ICTPU	24.90	3.00	22.74	2.98
ICTEOU	24.74	3.27	22.62	2.80
TAICT	24.78	2.85	22.34	2.76
Total	123.44	14.23	111.80	13.1

Table 9 shows the results of comparison among public and private sector universities with the subscales of ICT. The results indicate the public sector university faculty have higher use of ICT as compared to the private sector universities (Public M= 123.44, Private M= 111.80). The result further reveals that faculty of public sector universities have higher scores on Teacher Attitude towards ICT and ICT Ease of Use.

Table 10

Comparison of Public and Private sector universities on Usage of ICT

t-test	df	Sig
29.850	99	.000

Table 10 indicates that there is significant difference in use of ICT by faculty members among public and private sector universities in the teaching and learning process. The value of t-test is 29.850 and level of significance is 0.000 which is highly significant.

Table 11

Comparison of Mean and Standard Deviation of university faculty scores on ICT for variable "Computer users" (N=100)

Subscales of ICT	Computer users					
	Basic (n= 23)		Intermediate (n=52)		Advance (n=25)	
	M	SD	M	SD	M	SD
ICT Awareness	22.95	2.05	22.82	2.85	25.08	3.04
ICT Adoption	22.65	2.48	23.00	2.99	23.88	3.38
ICTPU	22.59	2.21	23.75	2.95	25.00	2.97
ICTEOU	22.69	2.03	23.38	3.37	25.20	3.09
TAICT	22.61	2.29	23.23	3.28	25.08	3.05
Total	113.49	11.06	116.18	15.44	124.24	15.53

Table 11 indicates the mean and standard deviation of university faculty scores of ICT on the variable Computer Users. The result reveals that advance user of computers has higher means scores on the total scale of ICT as compared to basic and intermediate users. The results further portrays that faculty members who are advance computer users have higher scores on the ICT Ease of Use, ICT Awareness and Teachers attitude towards the ICT.

Table 12

One way Analysis of variance of Faculty scores on ICT for the variable Computer user

Source	df	Mean Squares	F	Sig
Between Groups	2	784.424	5.835	0.004
Within Groups	97	134.440		
Total	99			

Table 15 indicates that there is significant difference between the responses of university faculty members on ICT for the variable computer user and the value of $F_{(2, 97)} = 5.835$, $p<0.004$.

Discussion

The present research was designed to explore the use of ICT among public and private sector universities in the teaching and learning process. Data was collected from 100 faculty members working in public and private sector universities of Rawalpindi and Islamabad. The study was primarily based to address the research objectives. To fill full these objectives and various hypotheses were formulated and various statistical techniques were carried out.

In order to explore relationship between research variables and research instruments, Pearson coefficients of correlation were calculated. The results of inter scales correlation of ICT portrays that all the subscales were significantly positively correlated to each other and with total scale of ICT (see table 1). Item correlation was also calculated. After the computation of item total correlation, it was derived out that positive correlation exits among all 30 items of research questionnaire.

The first hypothesis of the study was that there is a significant difference in the awareness of public and private sector university faculty about the use of information and communication technology in teaching and learning process. The result portrays that public sector university faculty frequently use ICT in the teaching learning process as compared to the private sector university faculty. Finding supports this hypothesis because there is significant difference between public and private sector universities in use of ICT in teaching and learning process (t-test 29.85).

The second hypothesis was that male faculty members use ICT more in the teaching and learning process than female faculty members. The findings of our study supported the hypothesis because result illustrates that male faculty members frequently use ICT than female faculty members. A significant difference exist between the responses of university faculty members belonging to both genders on usage of ICT (F=4.187, p<0.04).

The third hypothesis formulated was that the use of ICT is higher among young university faculty members as compared faculty of other age groups. Results supported this hypothesis and from findings, it is confirmed that use of ICT increases with increase in age. ANOVA also indicates significant difference between the responses of university faculty members belonging to various age groups on ICT (F 6.118, p<0.005).

The fourth hypothesis was Professors use ICT more frequently in the teaching learning process than faculty working in other position. Results show that Professors were more frequent users of ICT as compared with Assistant professors and Lecturers. Professors have higher scores on the ICT Adoption and ICTEOU while lecturers have more ICT Awareness and Assistant professors have higher score on ICT Perceived Usefulness.

Qualification was important factor that affects the use of ICT of the university faculty. Hence, the fifth hypothesis was that faculty having M. Phil degrees uses ICT more in teaching learning process than Master and PhD degree holders. The result portrays that university faculty possessing M Phil exhibits high use of ICT than faculty of other qualification levels.

The sixth hypothesis was that more experience university faculty has higher use of ICT than university faculty with less experience. The results illustrated that mean scores of experienced faculty were higher on the total scale of ICT, whereas mean scores of less experienced were low.

The seventh hypothesis was that faculty with higher knowledge of computer hardware (Advance computer users)and software use more ICT in teaching learning process than faculty with less knowledge of computer hardware and software (basic and intermediate users). This hypothesis was accepted because advance computer users have higher mean scores on the total scale of ICT as compared to basic and intermediate users.

Findings

Following findings were drawn from the research:

1. The study found out that there is a significant difference in the awareness of public and private sector university faculty about the use of information and communication technology in teaching and learning process.
2. Study reveals gender differences in the faculty usage of ICT and male university faculty are more frequently use of ICT in teaching leaning process as compared to female university faculty(Male M=120.16, Female M=115.19).
3. It was found that younger university faculty (M=118.36) use ICT more in the teaching and learning process as compared to older ones (M=109.24).
4. Result reveals that Professors (M=119.19) are most common user of ICT as compared to Lecturers (M=118.07) and Assistant professors (M=117.17).

5. The use of ICT is higher among the university faculty having MS/M Phil (M=119.08) as compared to faculty having Master (M=116.44) and PhD (M=113.6).
6. The study shows that the university faculty members with more experience (M= 120.11) have higher use of ICT as compared to university faculty members with the less experience (M=118.84).
7. Result illustrates that the university faculty working in public sector (M=123.44) institutions are more frequent user of ICT than faculty serving in the private sector universities (M=111.80).
8. The result reveals that advance users (M=124.24) of computers have higher means scores on the total scale of ICT as compared to basic (M=113.49) and intermediate users (M=116.18).

Conclusions

The Following are the conclusions of the study:

1. There is a significant difference in the awareness of public and private sector university faculty about the use of ICT in teaching and learning process.
2. Results showed gender differences, male university faculty have more usage of ICT as compared to female faculty.
3. Younger university faculty more frequent users of ICT as compared to older faculty members.
4. Faculty having M. Phil degrees more frequently uses ICT in the teaching learning process than faculty having Master and PhD degrees.
5. Professors have higher usage of ICT in the teaching learning process as compared to Lecturers and Assistant Professors.
6. Experienced faculty is frequently using ICT in the teaching learning process than faculty members with the less experience.
7. Overall, the use of ICT is higher in public sector university faculty as compared to private sector faculty.
8. Faculty with higher knowledge of computer hardware and software use more ICT in teaching learning process than faculty with less knowledge of computer hardware and software.

Recommendations

Keeping in view the importance of ICT in this modern era, educational planners and academicians ought to play a positive role in introducing the effective usage of ICT and ICT based curriculum at university level.

On the basis of the results and conclusions of the present research, the following are some of the recommendations:

1. Higher education is considered as stratum of future development, it expects that university management may increase the use of advanced ICT tools and services for interactive learning environment and establishing improved teaching and learning process in higher education.

2. Findings of the study discovered that there is a significant difference in the usage and awareness of ICT in public and private sector universities. Furthermore, public sector university are among frequent users of ICTs, it is therefore, recommended that private sector university may provide better IT environment with more facilities. Along with this management may create awareness and proper training so faculty can incorporate the usage of ICT in the teaching learning process.

3. Male university faculty use more ICT than female faculty in teaching and learning, so universities management may provide equal opportunities for both male and female faculty for the effective application of ICT in classroom situation. Proper training may be provided to female faculty so they may encourage for the usage to ICT in classroom situation.

4. Younger faculty members are most common users of ICT than older faculty members. It is recommended that older faculty may also be encouraged to learn the usage to modern ICT tools in the teaching and learning process.

5. Faculty having M. Phil degrees is the most common users of ICT than Master and PhD degree holders so; it is recommended that Master and PhDs qualified professionals may be engaged in the training of usage of ICT in teaching and learning process.

6. It is also recommended that management may provide proper financing for the proper installations and maintenance of ICT tool to faculty. Management can also take proper steps for the integration ICT in formal university curriculum in all departments.

7. Result indicates that Professors have higher usage of ICT as compared with Lecturers and Assistant Professors; it is also recommended that Lecturers and Assistant Professors may be equipped with the training of the usage of ICT tools for enhancement ICT skills.

8. Experienced faculty has better scores in the use of ICT than less experienced faculty. So, it is recommended that less experienced faculty may be given seminars and short course on the usage of ICT and ICT awareness. Moreover, they may also be provided opportunities to observe the senior university faculty.

9. Faculty having advance computer skills is most common users of ICT as compared to faculty having basic and intermediate skills therefore; it is recommended that university management may ensure the availability of ICT for basic and intermediate users. Advance knowledge in the field of ICT may be imparted to the faculty through formal trainings, seminars and workshops.

References

Aduke, A. F. (2008). Usage and Challenges of Information and Technology (ICT) in Teaching and Learning in Nigerian Universities. *Asian Journal of Information Technology, 7*(7), 290-295.

Daniels J.S. (2002). *"Foreword" in Information and Communication Technology in education-A curriculum for schools and program for teacher Development*. Paris: UNESCO.

Davis, N. E., & Tearle, P. (1999). A core curriculum for telemetric in teacher training.

Ekundayo, M. S. E. (2009). *Capacity constraints in developing countries: A need for more E-learning space.* The case of Nigeria. Paper presented at the Proceeding oscillates Auckland.

Kumpulainen, K. (Ed.). (2007). *Educational technology: Opportunities and Challenges.* Oulu, Finland: University of Oulu

Ofondu, G. (2007). Nigeria Literacy Educators and their technological needs in the digital age. *Educ. Focus, 1*(1):22-30.

Pulkkinen, J. (2007). Cultural globalization and integration of ICT in education. In K. Kumpulainen (Ed.), *Educational technology: Opportunities and challenges* (pp. 13–23).Oulu, Finland: University of Oulu.

Usluel, Y. K., Askar, P., & Bas, T. (2008). A Structural Equation Model for ICT Usage in higher Education. *Educational Technology & Society*, *11*(2), 262-273.

Wood, D. (1995). Theory, training, and technology: Part I. *Education and Training, 37*(1), 12–16

Yusuf, M. O. (2005). Information and communication education: Analyzing the Nigerian national Policy for information technology. *International Education Journal*, *6* (3), 316- 321.