Assessment of the Applied Aspect of ICT in Teacher Education

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Abstract

In this technological epoch, the effects of ICT could be seen in all professional areas including teaching and training of teachers. Teachers must possess adequate and sound ICT skills in order to be effective practitioners and competitors in theglobal arena. In Pakistan, teacher education is accessible through diverse modes like on-campus programs, distance learning, and affiliated colleges, etc. In these programs, ICT is offered as a unit of subject or as a distinct course. Now, it is a query that whether the prevailing programs are adequate to develop the projected ICT competencies in teachers? This study is an endeavor to explore the teachers' proficiencies of working with ICT. In this pursuit, the researchers employed quantitative plan and investigated participants who were holders of master degrees from these three modes of teachers' education. A rating scale was employed for retrieving information regarding application of ICT. The findings revealed that on overall basis, most of the students were found below average on the applied facets of ICT. In comparison, learners of University campus showed slight eminence. It could be drawn that the prevailing curricula of teacher training are mainly directed towards the theoretical aspect of ICT and has little or no concerns with application and assessment of practicing. It is proposed that the practical aspect of ICT may be given due attention to the teachers' education. It may also be incorporated as a distinct subject in diverse programs of teacher education. Further, the research scholars are suggested to reconnoiter and design schemes for operational inclusions of ICT at various level of teachers' Education

Keywords: Teachers, ICT, Education, Assessment, Teachers' training,

Introduction

Teachers maintain a central position in the process of education.The quality of teaching is associated with the proficiencies of teachers. Effective teachers are the output of sound teacher education programs. Ali, Khan, and Atta (2009) argue that teachers are in the key position in the system of education. They can introduce effective planning, bring useful innovations, carry efficient teaching and provide a pleasant environment for learning.

In this era of changes and innovations, teachers are expected to keep pace with the advances in instructional strategies. ICT (Information and Communication Technologies) has

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influenced all walks of life including education. There is a growing demand to equip teachers with contemporary techniques and strategies of instruction. The British Council (2000) described that in order to be in the global race, it is inevitable to promote the system of education through mastering teachers' contemporary techniques, skills, and proficiencies

The scenario of teaching has changed from chalk and duster to advanced technologies of communication. The worth of ICT has been addressed in the form of a chapter of a course or a whole course of various programs of teacher education. In the curricula, there are provisions for the theoretical as well practical aspect of ICT. Oh and French (2004) hold that in learning environment with digital instrument, a classroom could not be considered absolute without computers, projector, internet, software, and other interactive devices. Davis (2009) believed that in today's technology-based society, the significance of the teachers is obvious in propagation of quality education by involving computer application. The institutions of teachers' education are also required use of ICT in the classes to propagate quality skills and knowledge.

It has been acknowledged that teachers have a key role in implementing any change for the improvement of instructional processes. ICT will have a low impact if teachers are not included in all steps of ICT integration to the curriculum (Usnan, 2009). Likewise, researchers like Pope, Hare, and Howard (2002), Selinge (2001) are of the views that teachers' education programs in vogue are not capable of producing competent teachers to carry instruction with technology. Further,Adeyinka, Adedeji, Majekodunmi, Lawrence, and Ayodele (2007) identified teachers' inexperience in use of ICT as a major factor that impedes teachers to become ready for and poised in use of ICT. These views led the researcher to assessthe proficiencies of graduates of teachers' education in using various forms of ICT in the local settings. It was also intended to carry the investigation in different types of teachers' training institutes and across gender.

Objectives

- To perceive levels of respondents' proficiencies in the use of ICT
- To draw a comparison of ICT proficiencies in a gender perspective
- To compare ICT proficiencies across different institutes

Review of the Related Literature

The eminence of education is associated with the excellence of teachers because a nation reflects the teachers and education. A nation is developed by its inhabitants, who are shaped by

the teachers and the teachers are molded by the teachers' educators who are the product of any teacher training organization. In a nutshell, a teacher is an uppermost individual in the pyramid of education and the entire programs of educational improvement revolve around him for implementation (Panda &Tewari, 2009). Adeyinkaet al. (2007) recommended that in training and in policies for the professional development of teachers, ICT oriented models of instruction should be considered which enhance active roles of teachers and students in the process of learning.

ICT is an electronic oriented mechanism to transfer, receive, execute and retrieve information which has drastically transformed the peoples' ways of thinking and living and the overall environment (Ogunsola, 2005). ICT may not be considered mere tools which supplements or substitutes existing instructional approaches. Instead, it is considered as a vital mean to enhance new instructional strategies. It can be employed to enhance student's abilities to cooperate, communicate, resolving problems and continued learning (Voogt, 2003).

ICT has become a vital ingredient to build a progressive society. Many countries of the world consider learning ICT and grasping its fundamental notions as a core of curriculum together with writing, reading and calculating. It is not merely a computer or computing activities instead it is a combination of informatics and communication technologies (Olakulehin, 2007).

In the teacher training institutes of Pakistan, ICT is offered as a section of the course or a separate course at different levels. In the context of Pakistan, University of Education offers "ICT in Education" and "instructional technology". These courses mainly include the fundamentals of computer programs like MS-Office, software, hardware, presentation through multimedia, video conferencing and so forth. These courses stress the technology-based approaches of instruction (Higher Education Commission, 2005)

Majority of the experts of education opined that the newly trained teachers must be equipped with skills to employ ICT for the instruction. Perhaps, some of these learners may have obtained this capacity but most of them have not such competency (Valdez et al., 2004). There are various factors that impact the effective inclusion of ICT in teacher education. It is vital for teachers' trainers to grab the cost-effectiveness of various approaches to employing ICT in teacher education (Afshari, Bakar, & Luan, 2009). Sutton (2003) found that prospective teachers

were dissatisfied with the effectiveness of ICT and they asked for more support to get mastery of computer associated skills.

In the context of Pakistan, Safdar and Zafar (2010) showed concerns over the utility of ICT relevant courses. Likewise, Arshad and Asif (2010) hold that in the ICT relevant teacher training courses much time is devoted to the theoretical aspect and the applied aspect has been ignored.Further, Najam (2010) provided that prospective teachers were agreed with the usefulness of ICT course but they showed concerns over the availability of the required facilities. In addition, Khan (2012) viewed that it is possible to employ ICT in teacher education in Khyber Pakhtunkhwa, Pakistan, but there are also some menaces and obstacles to achieve these objectives.The outcomes from research studies propose policy revision, campaign for ICT literacy, redesigning of curricula and introducing modules for training, introducing e-learning, resolution of technical, ethical and facility issues for ICT inclusion.

Keeping in view the aforesaid discussion, the researchers reconsidered the issue of ICT in teacher education with a special focus on its applied aspect. It is intended to conduct a small scale study on the teachers' competencies in various ICT relevant programs.

Method and Procedure

It was a quantitative expedition to explore the levels of teachers' proficiencies of using ICT. The targeted individuals of the study were the individuals who had obtained a master degree in education. Students from three cluster of teachers' education were considered for investigation. Their clusters were consisted of students from full-time regular university classes, distance education, and affiliated colleges. The regular university students were taken from Abdul Wali Khan UniversityMardan, the students of distance education were taken from Allama Open Iqbal University (AIOU) Islamabad and the students of affiliate institutes were the master degree holders in the education of the Country Model College, Charsadda. The convenient sampling technique was used and 30 students, including male and female, were selected from each group. The sample distribution is represented in Table 1. The data were collected through a rating scale of four points (1 = Non-proficient, 2 = Low, 3 = Medium and 4 = Expert). Students rated themselves on their competencies in use of MS-Word, MS-Excel, MS-PowerPoint, internet, email, multimedia, smartphone, and facebook.

Table 1: *Sample Distribution*

Forms of Teacher Education	Male	Female	Total
Regular University	18	12	30
Distance Education	19	11	30
Affiliated Colleges	17	13	30
Total	56	34	90

Data Analysis

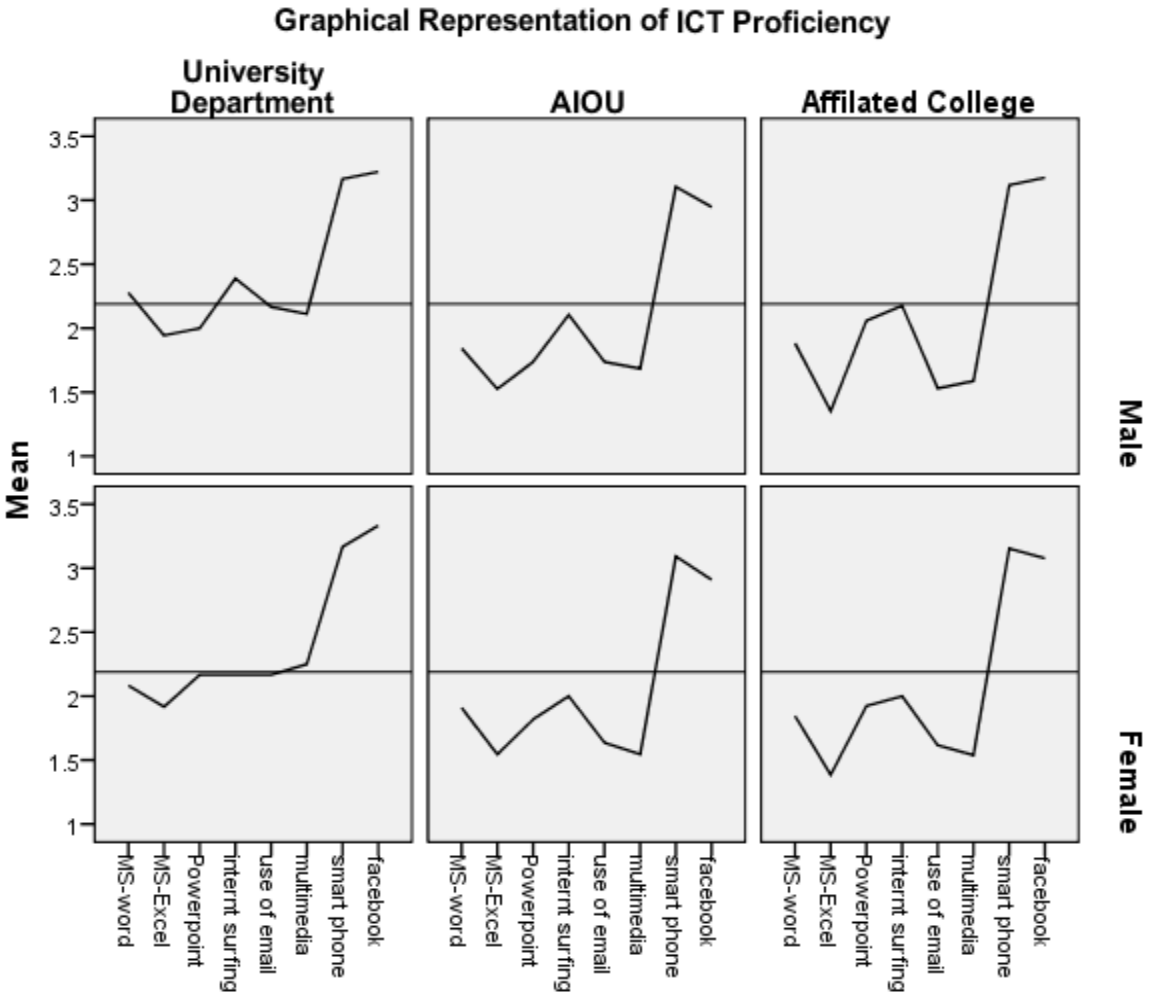
The statistical approaches of mean, t-test and ANOVA were applied for the purposes of analysis. The outcomes are also represented through graphs.

Table 2: *Mean and t-test Analysis*

	Gender	Mean	Std. Deviation	T	df	Sig. (2-tailed)
MS-word	Male	2.00	.752	.343	88	.732
	Female	1.94	.754	.343	75.060	.733
MS-Excel	Male	1.61	.712	.000	88	1.000
	Female	1.61	.688	.000	76.910	1.000
PowerPoint	Male	1.93	.669	-.316	88	.752
	Female	1.97	.696	-.314	73.038	.754
internet surfing	Male	2.22	.691	1.081	88	.283
	Female	2.06	.754	1.062	70.599	.292
use of email	Male	1.81	.779	.055	88	.956
	Female	1.81	.786	.055	74.664	.956
Multimedia	Male	1.80	.711	.118	88	.907
	Female	1.78	.760	.116	71.609	.908
Smartphone	Male	3.13	.674	-.064	88	.950
	Female	3.14	.683	-.063	74.521	.950
Facebook	Male	3.11	.718	.000	88	1.000
	Female	3.11	.708	.000	75.882	1.000

The mean distribution indicates that students of both genders were lower on all aspect of ICT application except on internet surfing. It means that graduates of teachers' education from all forms of education were lower on the use of ICT. The higher average values are carried by the students' efficiency to use smartphone and face-book which are tools for social networks and are not usually used for academic purposes. The outcomes of the t-test highlighted that there were no significant variations on gender basis in operating ICT based programs. These outcomes are also vivid in Figure 1.

Figure 1



The figure shows that the majority of the scores of students on ICT related programs is below the mean line of the students both male and female of different institutes. The average scores on the use of smartphone and face-book are quite above the mean line. It indicates the

students' higher inclination toward social networking and entertainment. This inclination is vivid in Figure 2.

Figure 2

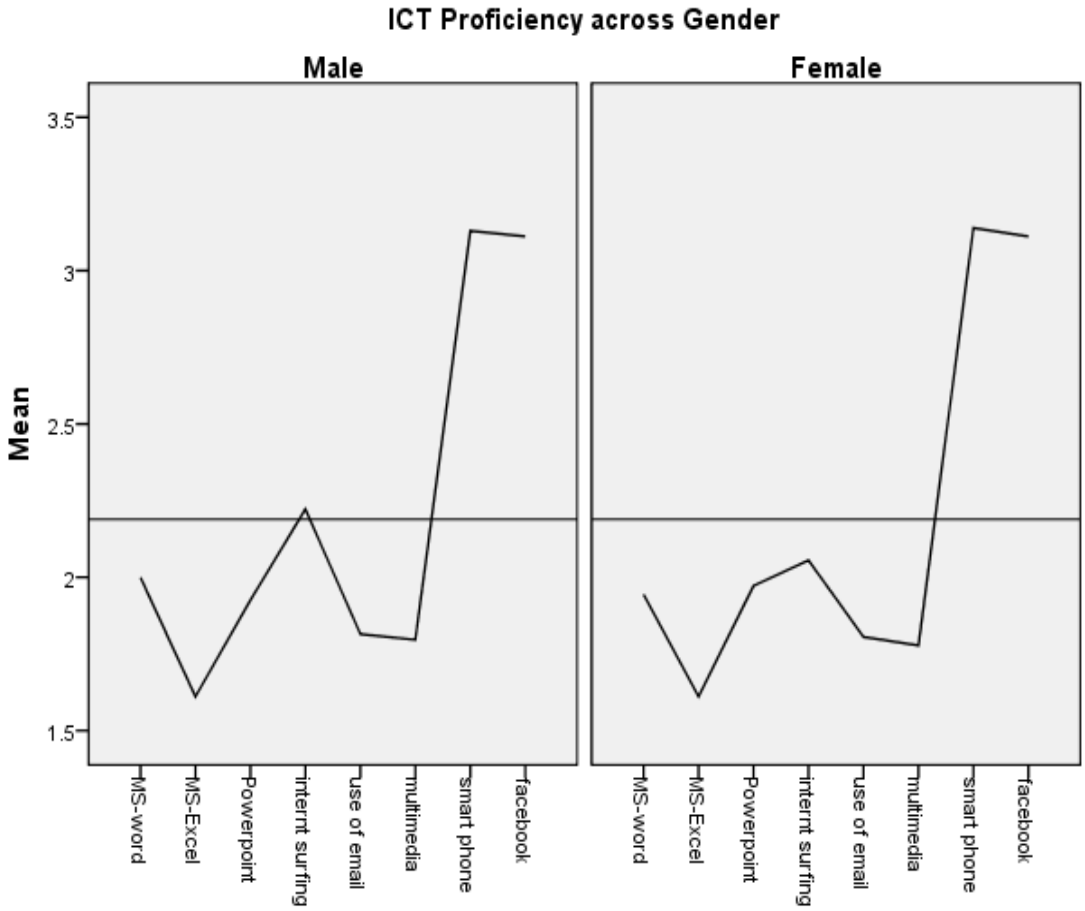


Figure 2 exhibits that there is no evident differences in approaching ICT on gender basis of all three forms of education. The male and female learners have almost similar inclinations. The male students have slight precedence in internet surfing which is on the mean line.

Table 3: *ANOVA Analysis*

		Sum of Squares	Df	Mean Square	F	Sig.
MS-word	Between Groups	2.222	2	1.111	2.025	.138
	Within Groups	47.733	87	.549		
MS-Excel	Between Groups	5.089	2	2.544	5.780	.004
	Within Groups	38.300	87	.440		
PowerPoint	Between Groups	1.489	2	.744	1.651	.198
	Within Groups	39.233	87	.451		
Internet surfing	Between Groups	.956	2	.478	.926	.400
	Within Groups	44.867	87	.516		
Use of email	Between Groups	5.956	2	2.978	5.416	.006
	Within Groups	47.833	87	.550		
Multimedia	Between Groups	6.489	2	3.244	6.970	.002
	Within Groups	40.500	87	.466		
Smartphone	Between Groups	.067	2	.033	.072	.931
	Within Groups	40.333	87	.464		
Facebook	Between Groups	1.689	2	.844	1.701	.189
	Within Groups	43.200	87	.497		

The ANOVA test was employed to determine variations in approaching ICT across different media of teacher education. The ANOVA scores for MS-Excel *(F (2, 87) = 5.780,* p = 0.004 <0.05) indicate meaningful differences. Likewise, the significant variation is also found on the 'use of email' *(F (2, 87) = 5.416,* p = 0.006 <0.05). In addition, the notable differences on ICT competency could also be seen in the capacity to 'use multimedia' *(F (2, 87) = 6.970,* p = 0.002 <0.05). The outcomes of ANOVA are further elaborated by the Tukey test.

Table 4: *Multiple Comparisons* *Tukey HSD*

Dependent Variable	(I) Type of Institute	(J) Type of Institute	Mean Difference (I-J)	Sig.
MS-Excel	University Department	Affiliated College	.567*	.004
use of email	University Department	AIOU	.467*	.044
		Affiliated College	.600*	.007
Multimedia	University Department	AIOU	.533*	.009
		Affiliated College	.600*	.003

Table 4 contains data only of significant differences. The Tukey findings indicate that the graduates of the regular university departments were superior (MD = .567, p = 0.004) to the learners of affiliated colleges in working with MS-Excel. Similarly, the regular campus students were notably better than the graduates of AIOU (MD = .467, p = 0.044) and affiliated colleges (MD = .600, p = 0.007) in frequency of using their emails. Again, the university students evidently surpassed the learners of AIOU (MD = .533, p = 0.009) and afflicted colleges (MD = .600, p = 0.003) in use of multimedia. It can be concluded that the students of university departments were significantly superior in the application of MS-Excel, use of email and running of multimedia. These variations in ICT proficiency is further explainedin Figure 3.

Figure 3

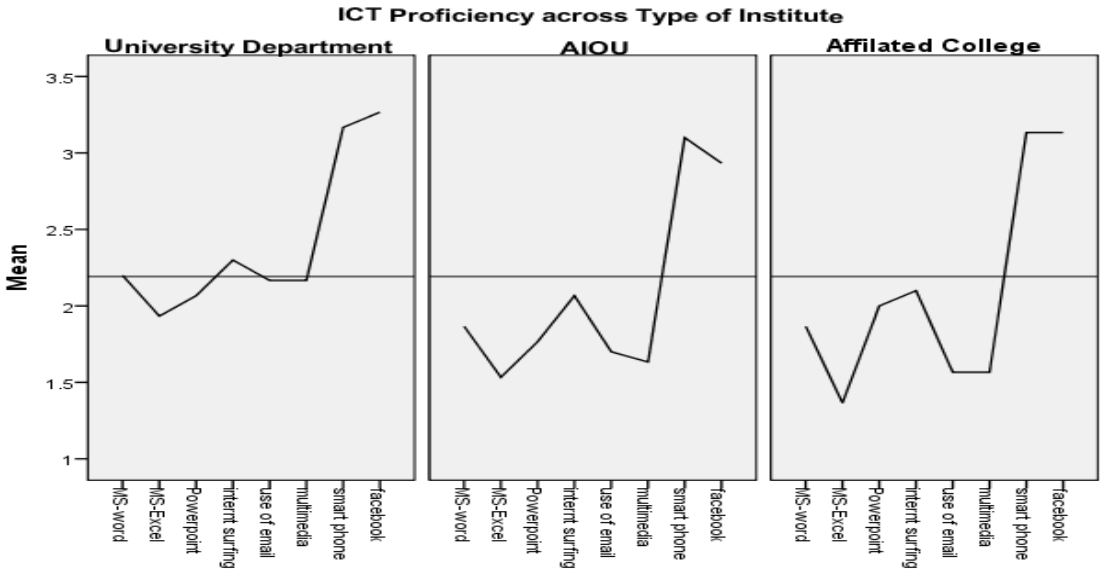


Figure 3 provides that most of the average values of the students of the regular university departments are clustered around the mean line. Conversely, the scores of the learners of AIOU and affiliated college are lying farther from the mean line, which depicts the slight superiority of on-campus graduates over learners of other institutes.

Discussion

The graduates of teachers' education were poor on all facets of ICT application as indicated by the study findings. Further, there were no considerable disparities across gender and type of institutes. It could be drawn that in teachers' training institutes, major emphasis is on theoretical learning and have little care for practical and applied learning. Bonwell and Eison(1991)narrated that learner must be provided with active learning. It is branded as students'active position, emphasis of acquaintance of skills and immerses superior thinking. Active students show excellence in perception, observation, arguing and resolving quandaries (Khan, Majoka, Khurshid, & Shah, 2017).

In the local scenario, students also prefer to memorize and learn the subject matter instead of practical learning because of assessments requirements. Halai (2012) reported that in Pakistan, active learning is no preferred due their assessments' requirements as compared to international standards. Likewise, Ali (2008) commented that pedagogic practices are mostly lecturing to inactive learners whose responsibility to record notes to be memorized. The products of these inactive strategists are students with lots of memorized information with the purpose to engender them in the examinations. Khan and Saeed (2009) have approved the in programs of teachers' education activity-oriented instructions and problem-solving tactics may be adapted. Likewise, use of AV aids like computer, multimedia, and projector may also be undertaken.Aksit, Niemi, &Nevgi (2016) reported that vast strength and dearth of requirements are also among the hurdles to applied learning.

The misuse of ICT is common among the local inhabitants whether they are students or professional. The inference from this investigation revealed that majority of the respondents were efficient users of the internet, smartphone, and Facebook.Gok (2015) informed that students generally prefer to use smartphones for calling, messaging, listening and watching videos and particularly use social media i.e. Facebook, Twitter, etc. Likewise, above 65% learners use computers for similar activities for more than two hours. To the contrary, use of ICT

for academic and investigating purposes is the final and least time consumption activity they perform.

The effective inclusion of technology in any educational enterprise mainly rests on the teachers' approach and assistance. If teachers assume that computers do not accomplish students' and/or teachers' needs, probably they will resist any technological innovation (Askar&Umay, 2001). Hence, there is a need to change the outlook of teachers towards ICT and it could be adequately considered through comprehensive training.

In the education society, the demand for improvement in the implication of ICT is mounting. It is stressed that reforms should be brought in teacher education to enable them to use computers as well as plan high standard technology-oriented lessons (Brush et al., 2003; Dawson, 2003; Wilson, 2003). Similarly, Peck, Augustine, and Popp (2003) provided that teachers' educators must be provided with an explicit line of actions to revise their courses of methodology in an efficient manner for ICT inclusion. BECTA (2004) addressed that teachers are lower in ICT competence and they are in need of training. The literature also suggests that effective training of teachers is mandatory for ICT infusion. Teachers' deficiency of ICT along with poor quality of teachers' trainings are considered as a major barrier for teachers to employ ICT.

Conclusions and Recommendations

The outcome from the data analysis displays that most of the graduates of all types of institutes of teacher education were quite lower in the use of ICT. However, the learners of university departments showed slight eminence over learners of other institutes, particularly, in working with MS-Excel, email, and multimedia. Some of these students may have obtained this proficiency from other courses as well. In the courses of teachers' training, there are negligible opportunities for the students to employ ICT as indicated in the literature. Conversely, the students of all types of institutes showed superiority in the use of smartphone and face-book, which are mostly used for social contacts and negligibly for academic purposes.

It is recommended that the applied feature of the ICT may be highly focused on the programs of teacher education. ICT may be included as a core course for teacher education programs at various levels. Further, the courses and policies concerning ICT may be revised for improvement. The teacher education institutes may be fully equipped with ICT equipment. Further, a proper practical assessment regarding ICT may be taken. In addition, researchers are

advised to carry detailed investigation on the applied aspect of ICT. They may also put forward strategies for developing a balance between theoretical and practical aspects of ICT oriented courses. Further, the professional may also focus on the ethics and academic use of face-book and smartphone.

References

Adeyinka, T., Adedeji, T.,Majekodunmi, T. O., Lawrence, A., &Ayodele, A. A. (2007). An assessment of secondary school teachers uses of ICT's: Implications for further development of ICT's use in Nigerian secondary schools. *The Turkish Online Journal of Educational Technology, 6*(3), 5-17.

Afshari, M., Bakar, K. A., & Luan, W. S. (2009). Factors affecting teachers' use of information and communication technology. *International Journal of Instruction, 2*(1), 77-104.

Ali, A. A. (2008). Perceptions, Difficulties and Working Memory Capacity Related to Mathematics Performance. Master Thesis, University of Glasgow, UK.

Ali, A., Khan, U. A.,& Atta, M. A. (2009). Evaluation of in-service teacher training programme offered to university teachers in the staff training institute, University of Peshawar, NWFP, Pakistan. *Gomal University Journal of Research, 25*(1), 37-45.

Arshad, M.,& Asif, M. (2010). Teachers' perceptions of the effectiveness of ICT in Teacher Education.Presented in the international conference, realizing the millennium development goals through teacher education at University of Education, Lahore, Pakistan.

Askar, P.,&Umay, A. (2001). Pre-service elementary mathematics teachers' computer self-efficacy, attitudes towards computers, and their perceptions of computer enriched learning environments. In C. Crawford, D.A. Willis, R. Carlsen, I. Gibson, K. McFerrin, J. Price & R. Weber (Eds.), Proceedings ofSociety for Information Technology and Teacher Education International Conference (pp. 2262–2263). AACE, Chesapeake, VA.

Aksit, F., Niemi, H., &Nevgi, A. (2016). Why is active learning so difficult to implement:The Turkish case. *Australian Journal of Teacher Education, 41*(4), 94-109.

Bonwell, C. C., &Eison, J. A. (1991). *Active learning: creating excitement in the classroom.* Washington, DC: Eric Clearinghouse on Higher Education.

British Educational Communications and Technology Agency (BECTA).(2004). *A review of the research literature on barriers to the uptake of ICT by teachers.*Retrieved fromhttp://www.becta.org.uk

Brush, T., Glazewski, K., Rutowski, K., Berg, K., Stromfors, C., Van-Nest, M. H., Stock, L., &Sutton, J. (2003). Integrating technology in a field-based teacher training program: the PT3@ASU Project. *Educational Technology Research and Development, 51*(1), 57-72.

Davis, N. (2009). Training teacher to use new technologies impact multiple ecologies: evidence from a national initiatives. *British journal of educational technology*, 40(5), 861-878.

Dawson, K., Pringle, R., & Adams, T. L. (2003). Providing links between technologyintegration, methods courses, and school-based field experiences: a curriculum-based and technology-enhanced microteaching. *Journal of Computing in Teacher Education, 20*(1),41-47.

Gok, T. (2015). The positive and negative effects of digital technologies on students' learning. The Eurasia Proceedings of Educational& Social Sciences (EPESS) (pp. 173-177).

Halai, N. (2012). Developing understanding of innovative strategies of teaching science through action research: A qualitative meta-synthesis from Pakistan. *International Journal of Science and Mathematics Education, 10*(2), 387-415.

Higher Education Commission. (2005).*Medium-term development framework 2005-2010.*Islamabad.

Khan, K., Majoka, M. I., Khurshid, K.,& Shah, S. M. H. (2017).Impact of active learning method on students' academic achievement in physics at secondary school level in Pakistan. *Journal of Education & Social Sciences, 5*(2), 134-151.

Khan, S. H.,& Saeed, M. (2009). Effectiveness of pre-service teacher education programme(B.Ed) in Pakistan: Perceptions of graduates and their supervisors. *Bulletin of Education and Research, 31*(1), 83-98.

Khan, Y. (2012). Analysis of teacher education and training programs of Pakistan for ICT-integration through open and distance learning: A case study. *Pakistan Journal of Education, 29*(1-2), 1-15.

Najam, (2010). Studying availability and uses of ICT in Teacher Education.Presented in the international conference, realizing the millennium development goals through teacher education at theUniversity of Education, Lahore, Pakistan.

Ogunsola, L.A. (2005). Information communication technologies and the effects of globalization: Twenty-first century "digital slavery" for developing countries- myth or reality? *Electronic Journal of Academic and Special Librarianship,6*(1-2), 1-10.

Oh, E.,& French, D.R. (2004). Pre-service teachers' perceptions of an introductory instructionaltechnology course. *Electron. J. Integr. Technol. Educ, 3*(1), 37-48.

Olakulehin, F. K. (2007). Information and communication technologies in teacher training and professional development in Nigeria. *Turkish Online Journal of Distance Education, 8*(1), 133-142.

Panda, B. N.,&Tewari, A. D. (2009). *Teacher education*. New Delhi; APH Publishing Corporation.

Peck, K. L., Augustine, C., & Popp, D. (2003). The AECT Project: modeling the effective use of technology in teacher education. *Tech Trends, 47*(2), 21-23.

Pope, M., Hare, D., & Howard, E. (2002). Technology integration: closing the gap between what preservice teachers are taught to do and what they can do. *Journal of Technology and Teacher Education, 10*(2), 191-203.

Safdar, M.,& Iqbal, Z. (2010). Teachers' attitude towards the use of ICT. Presented in the international conference, realizing the millennium development goals through teacher education at University of Education, Lahore, Pakistan.

Selinger, M. (2001). Learning information and communications technology skills and the subject context of the learning. *Journal of Information Technology for Teacher Education, 10*(1&2), 143-154.

Sutton (2003). Evaluating the training mechanism for the trainers in ICT related disciplines. *Journal of computing and instructional technology*, *54*(5), n. p.

The British Council. (2000). *Secondary Science Education Project: Draft Final Report.*Management of technical Co-operation Training. Islamabad: Author.

Voogt, J. (2003). Consequences of ICT for Aims, Contents, Processes and Environments of Learning. In J. van den Akker, W. Kuiper, & U. Hameyer(Eds.), *Curriculum landscapes and trends* (pp. 217–236). Dordrecht: Kluwer.

Usun, S. (2009). Information and communications technologies (ICT) in teacher education (ITE) programs in the world and Turkey. *Procedia Social and Behavioral Sciences, 1,* 331-334.

Wilson, E. K. (2003). Preservice secondary social studies teachers and technology integration: what do they think and do in their field experiences. *Journal of Computing in Teacher Education, 20*(1), 29-39.