

Pedagogical Use of ICTs in Public Teachers' Training Colleges of Karachi

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Abstract

The The Government of Pakistan has launched the reforms to address the quality of teacher education in view of the National Educational Policy (2009) and developed ten professional standards (NPSTP 2009) for the initial preparation of teachers, this quantitative descriptive study was an attempt to investigate public teachers training colleges of Karachi, faculty proficiency in the pedagogical use of ICTs in context of "NPSTP Standard # 7 and to identify constraints which they face in this context. A representative sample of 68 teacher educators from ten public sector teachers training colleges were selected conveniently to participate in this study. A tailor-made, self-administered questionnaire was used for data collection. The quantitative data was analyzed employing the descriptive statistical technique. The study found low proficiency in the pedagogical use of ICTs among faculty members. Moreover, in-sufficient training, restricted access to ICTs, lack of collegial learning, and less motivation among faculty were identified as main constrains which the faculty faced in the usage of ICTs. Subsequent to finding, feasible recommendations were suggested for the effective and efficient use of ICTs as an instruction tool.

Keywords: *Information and Communication Technology, Teacher Education, Pedagogy*

JEL Classification: *I21, I29*

INTRODUCTION

Over the last two decades, technology has penetrated all aspects of life and revolutionized the way people work and think today (Mikre, 2011). Modern Information Communication Technologies (ICTs) transforming the education system by providing ready access to information and knowledge beyond time and space. This technological change for developing countries opens unprecedented opportunities to access knowledge and to enhance educational systems (Moyle, 2010). Meleisea (2007) argue that it has been well recognized that ICTs have the potential to enhance the quality of education delivery.

Today, students around the world widely use information and communication technologies

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(ICT) for everyday communication, creative work, and information exchange, so they expect to be able to do the same in their educational environment. If schools train children in yesterday's skills and technologies they may not be effective and fit in tomorrow's world (Mikre, 2011). However, educators need support in understanding when and how to use ICT in the learning process to be able to find a common language with their students and to share their experience and knowledge. According to Rana (2012) technology (ICTs) has played a crucial role in improving teaching and learning in the light of educational reforms around the globe.

The success of any educational and instructional reforms is directly depending on the strength and quality of teachers' training institutions of any country. At present teacher education in Pakistan is in the transition phase. The Government of Pakistan has developed ten professional standards for teachers' recruitment and training (NPSTP, 2009 and with the support of USAID through their Pre-Service Teachers Education Programme (Pre-STEP) and Pakistan Reading Project (PRP) has launched the reforms to address the quality of teacher education program and institutions. A new curriculum has been developed, initially two programs such as a two-year Associate Degree in Education (ADE) and four-year B.Ed. (Hons) the program were started (Aysha, 2013), later on, secondary 2.5 years and 1.5 years programs were also introduced. The previous short duration out-moded Primary Teacher Certificate (PTC), Certificate in Teaching (CT), and the one-year B.Ed. programs are replacing by these long-duration advance courses gradually. The two subject "Computer literacy" and "ICTs in Education" are introduced in the new curriculum to equip prospective teachers with Standard #.7 of NPSTP 2009 (i.e., "Effective Communication and Proficient Use of Information and Communication Technologies") and to arm the contemporary technological skills required by a 21st-century educator.

In Pakistan, Government Colleges of Education (GCE), Government Elementary Colleges of Education (GCE), and University Departments of Education or Teacher Education are major public institutions along with some private sector institutions that impart teacher training through various academic programs (Dilshad & Iqbal, 2010).

Table 1 : Public Teachers Training Institutions, Karachi

Insinuations	Admn. Authority	Programs	Affiliation	Accreditation
<i>GCEs (2 College)</i>	<i>College Education Department Govt. of Sindh</i>	<i>M.Ed., (One year), B.Ed. (Hons) Elementary 4 years, B.Ed. (Hons) Second- ary 2.5 years</i>	<i>All the Col-leges are affil-iated with the Department of Teacher Edu-cat- ion, Uni-versity of Karachi</i>	<i>Accredited/listed by STEDA (provincial Accreditation and Licensing Authori- ty, Sindh) And also Accredited by NACTE and Ranked "Z" (Fed- eral Accred-itation Authority)</i>
<i>GECEs (5 College)</i>	<i>Directorate Teachers Training Institution (School Education Department Govt. of Sindh)</i>	<i>ADE and B.Ed. (Hons) Elementary 4 years pro-gram</i>		
<i>GECEs (3 College)</i>	<i>Karachi Metropolitan Corporation</i>	<i>ADE (2 year pro- gram, after Inter)</i>		<i>Not Accredited</i>

Source: NACTE, STEDA and University of Karachi official website

In Karachi, the biggest city of Pakistan, ten public sector teachers training institutions are working under the administrative control of three different authorities. Two public institutions, Government College of Education F.B Area Karachi and Jamia Millia, Government College of Education Malir are working under the administrative control of the College Education Department, Government of Sindh. These two institutions are offering M.Ed., B.Ed. (Hons) elementary 4 years, and B.Ed. (Hons) 2.5 years of programs. Five public institutions are working under the administrative control of Director Teachers Training Institution (School Education Department Govt. of Sindh. These institutions are offering ADE and B.Ed. (Hons) elementary 4 years of programs. One of these GECEs College recently handed over to an NGO "Durbeen" under the umbrella of public-private partnership policy, while three institutions are working under the control of Karachi Metropolitan Corporation (KMC). They are offering only the ADE program. All these three types of institutions are affiliated with the University of Karachi. The government colleges of education (GCEs) and GECEs of Directorate TTIs are only accredited by Sindh Teacher Education Development Authority (STEDA) the provincial accreditation and licensing authority of the province of Sindh. These two types of Education Colleges running under the administrative control of provincial government are also accredited by National Accreditation Council for Teacher Education (NACTE) and ranked "Z". Public sector teachers' training institutions' role is vital. The majority of the students are enrolled in public institutions (Halai & Iqbal, 2007) because of easy access and nominal fee structure.

As discussed earlier, current teacher training programs need to prepare future schoolteachers for computer technology integration (Wan, 2009). If teacher educators do not know about ICTs, they are unlikely to prepare prospective teachers adequately (Chowdhury, 2012).

Purpose of the study

The overall purpose of the study is to investigate the faculty's perspective on the pedagogical use of Information, Communication Technologies in public teachers training institutions of Karachi.

Research Questions

- 1 What is the level of faculty proficiency against NPSTP (2009) # 7, and it is 3 sub-standard (knowledge, skills and attitude)?
- 2 What kind of challenges faculty face in using ICTs for teaching and learning?

LITERATURE REVIEW

Pedagogical use of ICT

According to Meleisea (2007) the term Information and Communication Technologies (ICT), refers to "forms of technology that are used to transmit, process, store, create, display and share or exchange information by electronic means". ICTs are a combination of computer hardware and software, the network, and other digital devices used for knowledge sharing and storing (Chowdhury, 2012). The use of these technologies in education sometimes terms as technology integration and when technology is used by teachers to enhance education and learning as an instructional tool, it may be termed as instructional technology or pedagogical use of technology.

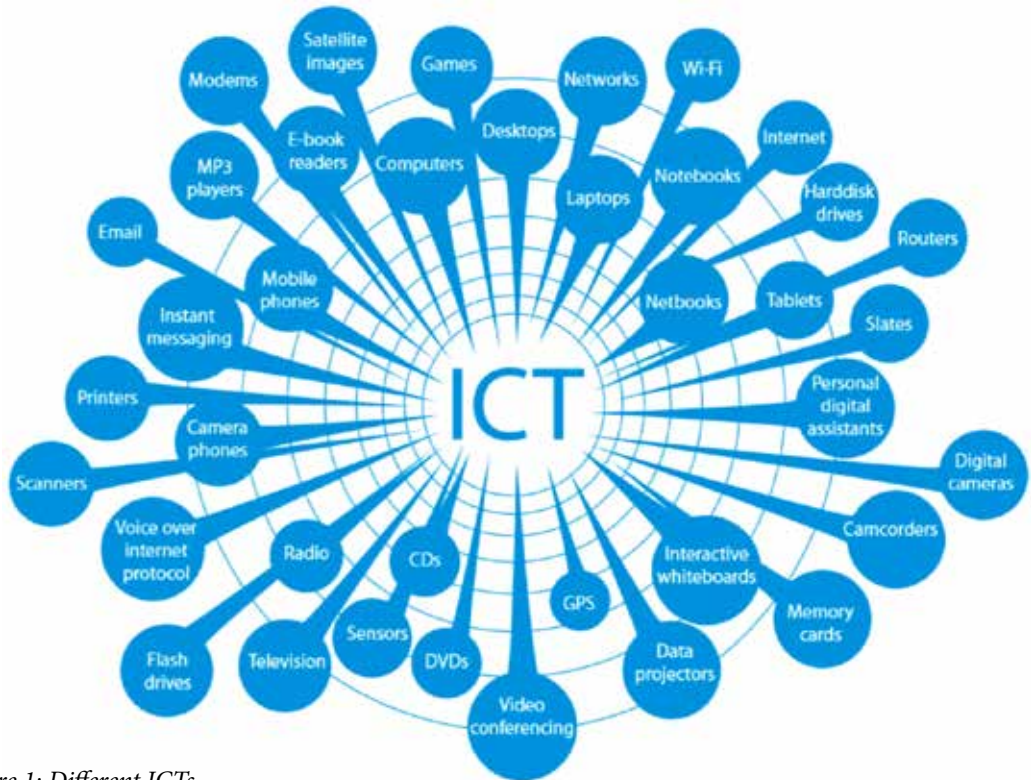


Figure 1: Different ICTs

Source: Source: Anderson (2010). *ICT Transforming Education: A Regional Guide*. UNESCO

Figure 1, taken from Anderson (2010) shows ICTs comprise technologies, which are used in education and in a different walk of life for capturing interpreting, storing, and transmitting the information.

Factors Influencing the Pedagogical use of ICTs

Many research studies identified that pedagogical use of Information, Communication Technologies is a complex process (Alrasheedi, 2009) that is influenced by many Institutional and Teachers' level factors (Albirini, 2004; Alrasheedi, 2009; Al-zaidiyeen, 2010; Koro, 2012; Bingimlas, 2009).

Teachers' Level Factors

Teachers' Beliefs: Teachers have both constructivist and traditional beliefs about learning and teaching. Teachers who hold constructivist beliefs are more likely to use ICTs as compare to traditional beliefs (Chai, et al., 2009, Alrasheedi, 2009; Kamldin, 2012). Similarly, the teacher's belief about the usefulness and difficulty associated with integrating technology influences whether or not they will use it (Kopcha, 2011; Brown 2014). It means the teacher can only be using technology in a meaningful way if they believe in it and are ready to use it (Brown, 2014; Shervani, 2014).

Teachers' Attitude plays an important role in determining people's reactions to situations. Research shows teachers' attitudes towards technology can play an important role in the

acceptance and actual use of the computer (Albirini, 2006; Al-zaidiyeen, 2010; Hassan & Sajid, 2013). Teachers' attitudes are considered as a major predictor of the use of new technologies in educational settings (Albirini, 2006). It is important to understand attitude is not only a single predictor about technology integration. Studies had identified a wide range of factors affecting attitudes toward ICT.

Teachers' competency level is an important factor which affects technology use for instruction purpose (Hassan 2013; Nandwani & Khan, 2016). Teachers' willingness to use technology depends on teachers' belief and confidence in his skills. Teachers who have fair computer knowledge and confidence in their usage at their home and for personal purposes are more likely to be using ICTs for academic and instructional purposes (Kamaldin, 2012; Shervani 2014).

Technology anxiety is another factor that is found in the literature. Technology anxiety is a major factor that affects a person's usage of technology in education (Nandwani & Khan, 2016). Teachers who had low experience with computers, female teachers, and introvert type person had a higher level of anxiety toward the use of technology (Gurcan-Namly, 2002, as cited in Shervani, 2014).

Demographic Variables (e.g., age, gender, experience, qualification): Conflicting and diverse results indicated that demographical variables (gender, age, experience, and academic qualification) do not play a significant role in using ICTs in education and learning (Tweed, 2013; Alrasheedi, 2009). Some studies exhibit that technology integration increases with teacherage, and years of experience, however, some findings specified that younger teachers use technology more in the classroom. Elderly teachers with orthodox teaching skills showed great reluctance towards acceptably of advanced ICT (Popoola, 2014). While some recent research indicates that teaching experience and age has no effect on technology integration at all (Tweed, 2013). Similarly, past studies proclaim that males have a more positive attitude towards computers than females. Many current studies stress that gender is not a significant predictor in the use of technology (Chai 2008, Tweed, 2013, Khalid 2016, Liqat 2012).

Institutional Level Factors

Infrastructure: Usually infrastructure refers to the essential hardware elements that form the basis of a system or structure. The ICTs infrastructure is a combination of hardware and software. The availability and easy access to ICTs is the first step towards the use of technology for academic and instructional purposes (Cassim, 2010). Many Government colleges of education and government elementary colleges of education, those offering B.Ed. (Hons) are equipped with ICTs under the CEDA project. They have good computer labs equipped with desktop computers and multimedia projectors, but classes are not equipped with ICTs. Many teachers training colleges do not have the proper infrastructure necessary for a professional institution (Khan, 2009). While it is also observed that in many institutions where resources are available, teachers are not allowed to use them freely. Limited access to resources not only prevents teachers to use ICTs but also demotivate teachers. Lack of access to the resource as a technology integration barrier cited in many studies (Kopcha, 2011; Chowdhury, 2012; Hassan, 2013).

Training: The most cited factor in literature is the lack of training or lack of effective training.

The majority of the teachers are not trained with ICTs (Hassan, 2013). They don't know about the resources available for instructional purposes. Professional development program increases technology integration. (Brown, 2013; Blackmoon, 2013,). According to Yidana (2007), the heavy investment in technology remains elusive if faculty numbers are not well equipped in terms of knowledge and skills to integrate technology into their instructions.

METHODOLOGY

The research strategy of this quantitative study was descriptive. Descriptive research is a type of research that is used to describe the characteristics of a population or phenomenon being studied. According to Best and Kahn (2014) "Descriptive research describes and interprets what is. It is concerned with conditions or relationships that exist, opinions that are held, processes that are going on, evident effects, or trends that are developing" (p117).

The population of the study was comprised of all faculty members working in public sector teachers training institutions of Karachi. The final sample of 68 faculty members who participated in the study was from 2 GCEs, 3 GECEs of Director TTIs, and 2 KMC GECEs. The characteristics of the sample are illustrated in Table # 2.

Table 2 : The Composition of the Sample

Demography	Variables	f	%
<i>Administrative Control</i>	<i>Director TTIs Sindh</i>	21	31
	<i>Director Colleges Sindh</i>	37	54
	<i>KMC</i>	10	15
<i>Designation</i>	<i>Lecturer</i>	42	62
	<i>Assistant Professor</i>	10	15
	<i>Associate Professor</i>	6	9
	<i>Others</i>	10	14
<i>Gender</i>	<i>Male</i>	28	41
	<i>Female</i>	40	59
<i>Age (in years)</i>	<i>Below 30</i>	2	3
	<i>31-40</i>	20	29
	<i>41-50</i>	28	41
	<i>51-60</i>	18	26
<i>Experience (in years, as Teacher Educator)</i>	<i>Below 5</i>	12	18
	<i>6-10</i>	21	31
	<i>Nov-20</i>	21	31
	<i>21-30</i>	12	18
	<i>Above 30</i>	2	3
<i>Qualification (Academic)</i>	<i>Master</i>	59	87
	<i>M.Phil.</i>	7	10
	<i>PhD.</i>	2	3
<i>Qualification (Professional)</i>	<i>M.Ed.</i>	47	69
	<i>B.Ed.</i>	15	22

	<i>None</i>	6	9
	<i>None</i>	24	35
<i>Qualification (Computer)</i>	<i>Certificate</i>	30	44
	<i>Diploma</i>	11	16
	<i>Bachelors</i>	1	1
	<i>Masters</i>	2	3

The sample of the study was comprised of 68 participants, out of these 68 participants 54% were from government colleges of education (GCEs), 31% were from government elementary colleges of education (GECEs) running under the administrative control of Director Teachers Training Institutions Sindh, while 15% were from government elementary college of education running under the administrative control of Karachi Metropolitan Corporation (GECEs-KMC).

In the selected sample, the designation of 74% participants were Lecturers, 15% were Assistant Professors and 9% were Associate Professors while 14% were others (Director Physical Education Instructors (DP) or promoted schoolteachers), meanwhile, 59 % of the sample of the study were female while 41% were male. According to the age group, only 03% of teachers were below 30 years, 29% were 31 to 40 years, 41% were 41 to 50 and 26% were from the age group 51-60 years. As for the teaching experience as a teacher educator, 18% of teachers have below 5 years of experience, 31% have 6 to 10 years, 31% have 11 to 20 years, and 18% have 21 to 30 years while 3% had above 30 years of experience. This analysis shows that majority of the respondents were experienced teachers. As for academic qualification, 87% of faculty members were Masters, 10% were having M.Phil. degree as their academic qualification and only 3% were having a Ph.D. degree as the highest level of qualification, 69% of the respondents were M.Ed., 22% were having a B.Ed. degree, while the remaining 9% were those who did not hold any professional degree, similarly 35% of the study participants reported that they did not had any formal qualifications regarding computers, 44% were certificate holders, 16% were having a diploma in IT, only one member declared that he/she is a Bachelors in Computer Science, while only 3% were Masters in Computer Science.

Research Tool

A tailor-made, self-administered questionnaire was used as a research tool. The items of the questionnaire were taken from the review of the relevant previous studies and B.Ed. (Hons) "Computer Literacy" and "ICTs in Education" courses. The validity and reliability of the research instrument were ensured through piloting. The reliability of the questionnaire on Cronbach's Alpha (.896) was found satisfactory. The questionnaire was constructed in three sections. The first construct was about demographic information. The second construct consisted of "Five Point Proficiency Measuring Scale". In this part of the questionnaire participants of the study were requested to determine their proficiency in the pedagogical use of ICTs. The scale was ranked on a five-point rating scale (1. Unfamiliar (I am not much aware of this application.), 2. Novice (I am a beginner user of this application), 3. Occasional user (I use this application very rarely), 4. Frequent user (according to instructional need, often, I use this application), 5. Expert practitioner (I am proficient and use this application in innovative ways). That Pedagogical use of scale was subdivided into three parts, Part A. Background Knowledge, Part B. Proficiency in

basic ICT tool, and Part C. Proficiency in Pedagogical use of specific Applications and Web-resources. The third construct is about faculty’s perspectives on hindrances and barriers which prevent them in the pedagogical use of ICTs. The scale was ranked on a five-point Likert scale.

Questionnaire and NPSTP # 7 alignment

In this questionnaire, the 5 point proficiency rating scale was aligned with NPSTP substandard as 1.Unfamiliar (Do not know.), 2. Novice (have some Knowledge), 3. Occasional user (have some understanding and rarely use: understanding), 4. Frequent user (skilled and usually use: Skill), 5. Practitioner (use enthusiastically and innovatively: Attitude).

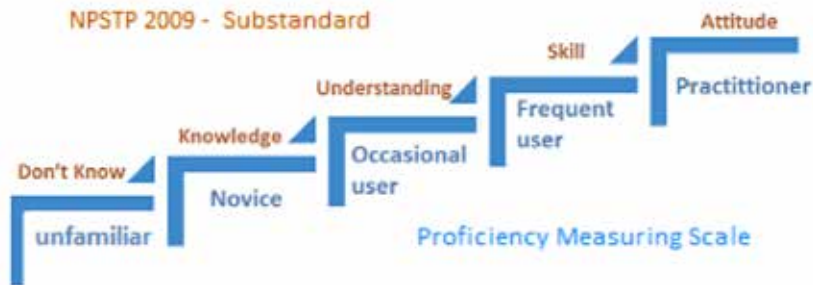


Figure 2 : NPSTP Substandard and Measuring Scale Alignment

RESULTS AND FINDINGS

Table 3: Analysis of Proficiency Measuring Scale “A” (Background Information)

SR #	Question statements	Expected Response	F	%
1.	<i>Do you have a computer at home?</i>	<i>Yes</i>	68	100
		<i>NO</i>	0	0
2.	<i>Do you have access to a computer at your institution?</i>	<i>Yes</i>	44	65
		<i>No</i>	24	35
		<i>Unlimited</i>	23	33
3.	<i>What sort of computer access do you have in your institution?</i>	<i>In schedule time</i>	4	6
		<i>Upon request</i>	17	25
4.	<i>Do you have an Internet connection at home?</i>	<i>Yes</i>	65	96
		<i>No</i>	3	4
5.	<i>Do you (faculty) have Internet access at your institution?</i>	<i>Yes</i>	27	40
		<i>No</i>	41	60
6.	<i>Have you ever participated in any in-service training related to ICTs.</i>	<i>Yes</i>	16	24
		<i>No</i>	52	76

In this part of the questionnaire, respondents were asked about computers and internet devices they used and computer training, almost all participants had a computer at home. According to 65% participants they had access to a computer at their institutions while 35%

had acknowledged that they did not have this facility, out of these 65% faculty members, 33% had declared that they had free access, while 32% have said that they have restricted access. Most of the faculty members used the internet at their home. A large number of participants, i.e., 60% stated that they were not enjoying the internet facility at their institution. About computer training, 24% stated that they had participated in computer training organized by Sukkur IBA University and CIDA (Canadian Donor Agency), while 76% of the participants never received any training about computers or ICTs.

Table 4: Analysis of Proficiency Measuring Scale “B”

SL. No.	Pedagogical use of ICT Level- 1 (Basic)	Unfamiliar	Novice	Occasional User	Frequent User	Practitioner	Mean	S. Deviation
	Common Software Packages and Applications	(%)	(%)	(%)	(%)	(%)		
1	Computer basics (e.g. adding a printer, setting Multi-Media, transferring data using a USB device, scanning and Saving a document/picture)	9	29	21	29	12	3.06	1.19
2	Word processing (e.g., MS Word)	9	24	19	35	13	3.21	1.20
3	Spreadsheets (e.g., Excel,)	25	29	15	21	10	2.62	1.34
4	Desktop Publishing (e.g., MS Publisher)	45	37	5	7	6	1.93	1.15
5	Presentation software (e.g., MS PowerPoint)	21	23	22	22	12	2.81	1.31
6	Drawing (e.g., MS Paint and MS Drawing Tool)	28	25	19	21	7	2.54	1.29
7	Handling pdf Files/E-Books (downloading, opening, saving/ printing)	19	24	19	29	9	2.85	1.28
8	Inpage (Urdu text editing)	43	15	15	21	6	2.29	1.37
9	Web browsing (searching, downloading, and saving stuff)	7	23	24	33	13	3.21	1.16
10	E-Mail (opening, composing & sending, Searching, attaching a file/folder)	5	19	25	36	15	3.32	1.12
11	Social Media (Facebook, Twitter, YouTube) sharing, uploading, and downloading stuff	6	15	15	54	10	3.49	1.05
12	Audio & Video (MP4, MP3, FLV file downloading and playing using a different application)	21	17	23	30	9	2.87	1.30
Cumulative Percentage (%) and Mean Score =		20	23	19	28	10	2.85	1.23

In this part of the questionnaire, respondents were asked about computers and internet devices they used and computer training, almost all participants had a computer at home. According to 65% participants they had access to a computer at their institutions while 35% had acknowledged that they did not have this facility, out of these 65% faculty members, 33% had declared that they had free access, while 32% have said that they have restricted access. Most of the faculty members used the internet at their home. A large number of participants, i.e., 60% stated that they were not enjoying the internet facility at their institution. About computer training, 24% stated that they had participated in computer training organized by Sukkur IBA University and CIDA (Canadian Donor Agency), while 76% of the participants never received any training about computers or ICTs.

The descriptive statistical technique (percentages, Mean score along with standard deviation) was used for data analysis. The analysis of the above table shows that 20% of the faculty members were not familiar with basic ICT tools, 23% were novice, 18 % participants had stated that they were using the ICTs occasionally, while 28% used frequently, only 10% had stated that they were proficient practitioner. Furthermore, the analysis revealed that very few faculty members had operational proficiency (38%) to use basic computer devices. Even from the analysis of item # 2 (word processing), item # 5 (Presentation software) and item # 9 (web browsing) exhibited low percentage of satisfactory usage which are quite necessary for 21st-century teacher educators, 30 % ~ were non-user of Desktop publishing tool which is used for the creation of cover/title pages, newsletters, and brochures designs, and much expected from B.Ed. (Hons) students in assignments preparation. The drawing tool is used for developing mind maps, organogram, and info-graphic, the analysis shows the above 50% were not using it. Moreover, results indicated that the faculty members are fond of social media, 54% used social media frequently. The analysis manifested that majority of the participants were not much aware of the handling of Audio and Video files and did not use it for instructional purposes. The overall analysis of the data reveals that above 40% of all faculty members were not familiar with many basic ICT tools. So, it is difficult for them to use ICTs in instructional practices. The above finding in the context of NPSTP is summarized in figure 3.

The overall analysis of the data reveals that above 40% of all faculty members were not familiar with many basic ICT tools. So, it is difficult for them to use ICTs in instructional practices. Moreover, above 3 Mean scores for the items (1, 2, 9, 10 and 11) shows a moderate level of proficiency in the use of some basic ICTs tool, while below 3 Mean score for remaining ICTs shows a low level of faculty’s proficiency in ICTs usage for pedagogical purpose. The above finding in the context of NPSTP is summarized in figure 3.

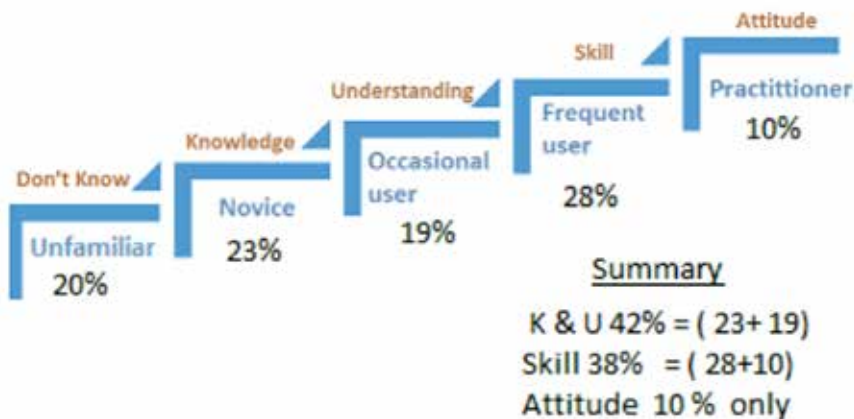


Figure 3 : Summary of the Results (Proficiency Measuring Scale B)

In the context of NPST # 7, the above analysis shows that 42% of faculty members have good knowledge of ICT tools and around 38% were skilled enough to use ICTs for instructional purposes. But a few faculty members use ICTs frequently. The overall Mean score (M=2.85) along with Standard Deviations (SD= 1.23) evident the low proficiency in the use of basic ICT

and confirmed the results of the percentage. So, it is concluded that the faculty member does not have a positive attitude towards the use of ICs, as expected in NPSTP # 7.

Table 5: Analysis of Proficiency Measuring Scale “C”

SL. No.	Pedagogical use of ICT Level-2 (Advance)	Unfamiliar	Novice	Occasional User	Frequent User	Practitioner	Mean	S. Deviation
	Specific Web Resources and Applications	(%)	(%)	(%)	(%)	(%)		
1	Teacher Education Knowledge Portal (<i>pakteachers.org</i>)*	41	27	16	13	03	2.10	1.17
2	Wikipedia	19	30	28	17	06	2.66	1.14
3	Khan Academy	54	18	13	13	02	1.90	1.16
4	Youtube or Sabaq foundation educational Video	47	13	25	24	02	2.15	1.20
5	WordPress	46	25	21	07	01	1.94	1.04
6	Dropbox	54	18	22	05	02	1.81	1.02
7	Google Docs	45	17	22	13	03	2.09	1.19
8	Google Translation	31	22	25	16	06	2.44	1.15
9	Google Map/Earth	26	28	23	21	02	2.44	1.15
10	LMS (Learning Management system e.g., Edmodo, Moodle, Google Class etc)	69	20	05	03	03	1.51	.96
Cumulative (%)		43	21	20	13	3	2.10	1.11

In this part of the questionnaire, the respondents were asked to rate their proficiency in using some specific web resources and applications specifically designed for educational purposes and the majority of them were part of the B.Ed. (Hons) current program. The Teacher Education Knowledge Portal which was developed with the support of USAID through their Pre-Service Teachers Education Programme (Pre-STEP) and Pakistan Reading Project (PRP) initially identified the main source for teaching-learning material for students and teachers when the reforms in teacher education program has been launched (Ali & Perveen, 2013), the result shows that 41% were not familiar with that portal, it means around 67% of the participants' assent that they had never used that portal, reaming 32% had used that portal time to time for instructional purpose when it was functional. Wikipedia is a popular open-source encyclopedia, the analysis shows that 51% of the participants were using this source while on the other hand, this shows that half of the sampled participants were not using Wikipedia for any/ instructional purpose. "Khan Academy" which is a specially designed Video-based learning website, the results show that 54% were not familiar, 27% identified as the users, out of this 27%, only 13% claimed that they are a frequent user of Khan Academy. Similar results were found in the case of YouTube and local video-based learning websites. Moreover, the study found that the faculty members were not much aware of the applications and resources recommended for teachers and specifically in B.Ed. (Hons.) ICTs in Education course. "Edmodo" is a highly recommended Learning Management Software (LMS) in B.Ed. (Hons) for student's interactive, collaborative, and real-time learning, this study found that 70% of the sampled faculty members don't know about learning management software (LMS). The overall analysis represented that 43% of participants were not familiar with the specific web

resources and application commonly used in education and learning, while 21% were novice or in other words 64% were non-user. Therefore, it is concluded that the resources specified in this questionnaire and B.Ed. (Hons) courses are not much in use of the majority of faculty members or in other words the majority of the faculty is not proficient in the use of these resources. Moreover, 2 or below 2 Mean scores for many items show a low level of proficiency in the use of specific web resources and applications. These results in the context of NPSTP # 7.

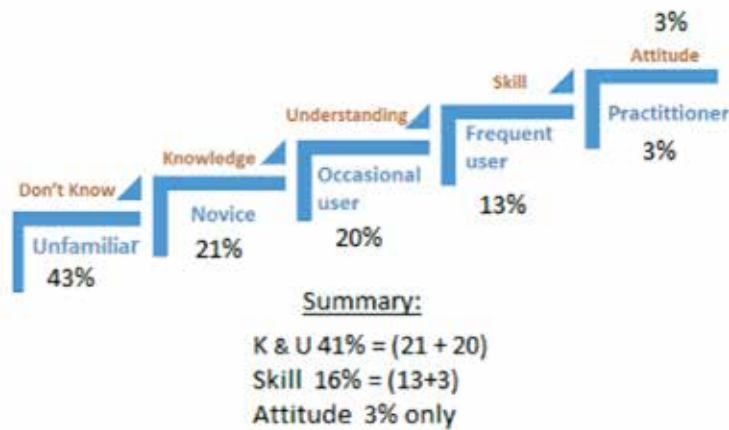


Figure 4 : Summary of the Results (Proficiency Measuring Scale C)

In the context of NPST # 7, the above analysis shows that more than half of the participants were not aware of the web resources suggested in B.Ed (Hons) curriculum. Around 16% had some skills to use them. The overall Mean score (M=2.10) along with Standard Deviations (SD= 1.11) validating the result of the percentage confirms the faculty’s low level of proficiency in the use of these resources. These findings reveal that a large number of faculty members of public TTIs are not passionate to use web resources recommended in B.Ed. (Hons) computer literacy and ICTs in education course and projected in NPSTP # 7.

Table 6: Barriers and Challenges in Pedagogical use of ICTs

S.#	Barriers and Challenges in Pedagogical use of ICTs	SA (%)	A (%)	UC (%)	DA (%)	SD (%)
1	I have insufficient training to utilize ICTs in the teaching learning process	22	36	8	22	12
2	I do not have enough time to develop instructional material utilizing ICTs	10	29	16	32	13
3	Inconvenient access to ICTs prevents me (faculty) to use ICTs in the teaching and learning process	7	49	15	25	4
4	I do not prefer to use ICTs because there is always uncertainty about the functionality of ICTs accessories	12	36	10	34	8
5	There is no ICT culture in Teachers Training Institutions	12	39	9	34	6
6	Faculty members are reluctant to use ICTs in teaching and learning	5	42	25	22	6
7	Faculty members are hesitant to share useful content and web resources with each other	25	46	7	19	13
8	The administration does not support the faculty to use ICTs for academic purposes.	10	37	19	28	6
Agree: (13+ 39) = 52%, Uncertain=14%, Disagree:(27+7) = 34		13	39	14	27	7

This is the last section of the questionnaire. This section is about the faculty perspectives on hindrances they might experience in using ICT. The five point of scale for easy communicable interpretation collapsed in 3 point (Agree, Uncertain, and Disagree). In-sufficient training and inconvenient access ~55% participants of the study (item # 1&3) had identified as major constraints in the pedagogical use of ICTs. Likewise, around 50% viewed that uncertain availability and functionality of ICT devices, organizational culture, lack of administrative support and faculty attitude itself (item # 4,5, 6 & 8) were also be the reason for less use of ICTs in TTIs of Karachi. Many studies time is also cited as a barrier in technology integration, 39% of participants, of this study were agreed with that notion, while 45% did not see time as a constrain. The highest percentage of participants i.e., 71% stated that faculty members did not share useful content and web-resources which is imperative among faculty, for the sustainable development of ICT culture in TTIs. Lack of collegial learning and mentoring is also reported as a barrier, also found in the literature (Brown, 2014).

CONCLUSION AND RECOMMENDATIONS

This study was an attempt to investigate public teachers training colleges of Karachi, faculty's proficiency in the pedagogical use of ICTs in the context of NPSTP (2009) Standard # 7 and its 3 sub-standard and to identify the constrain which they face in this context. The study used a questionnaire of three constructs. The first construct was about the sample, the analysis shows that a representative sample of 68 faculty members participated in the study.

From the analysis of construct two; proficiency measuring scale Part A (background information), it is concluded that almost all faculty had a computer at their home. The majority of the faculty (65%) have access to a computer at their institution but all-time open and convenient access is not available to all. The majority of the teachers use the internet at their home because this facility is not available for the majority (60%) at institutional level. Therefore, it is concluded that basic ICTs facilities are not evenly available to all faculty members at their respective colleges. Moreover, a few of the faculty members had formal computer qualification and as well 76% never had attended training regarding computers or ICTs use in education. Proficiency measuring scale part B and C results concluded that the majority faculty of public TTIs does not have sufficient ICT proficiency as projected in NPTSP 7. The analysis in term of substandard of NPSTP (Attitude) concluded that the majority (90%) of the faculty of public TTIs does not use ICTs enthusiastically (see results of Scale B 10% and Scale C 3%). Following to next substandard, Skill, results evident that near about half of the faculty is not enough trained (skilled) to use ICTs for the pedagogical purpose (see the result of scale B 38% and Scale C 13%), as the study observed majority of the faculty were not in touch of web resources recommended in B.Ed. (Hons) course or/and projected in NPSTP. The results show that around 40% of faculty were at just knowledge level. Which is not admissible for professional education institutions of the 21st century.

From the analysis of faculty responses (last construct of the questionnaire), this study concluded that lack of collegial learning (Hassan & Sajid, 2012), in-sufficient training (Shaikh & Khoja 2011), inconvenient access to ICTs (Hassan & Sajid, 2012), uncertain availability and functionality of ICT devices (Hassan & Sajid, 2012), organizational culture (Shaikh & Khoja, 2011), lack of administration support (Hassan & Sajid 2012), and less motivation among faculty (Hassan & Sajid, 2012) are major constraints in the pedagogical use of ICTs. Many

local studies demonstrated similar constraints regarding the use of ICTs at different levels of education in Pakistan (Khurshid et al., 2016; Hassan & Sajid, 2012; Shaikh & Khoja 2011; Nisar et al., 2011).

Recommendations

Official Authorities should develop a shared visionary ICT policy for teachers training institutions. Necessary infrastructure (computer devices, software along with high-speed internet) should be provided to all colleges to establish a multipurpose computer lab, and the classroom should also be furnished with necessary ICT devices and software (Hassan, 2013). Qualified technical staff should be appointed and posted to education colleges on priority. Where infrastructure is available should be updated and additional budget should be allocated strictly for only maintenance purposes. Need based training regarding the use of ICTs should be provided to all faculty (Hassan & Sajid, 2013) on First Need, First Serve bases. Accreditation authorities in their evaluation documents/tools should introduce a separate tool for ICTs and their usage. The University of Karachi should restore Subject Support Forum (SSF) and provide academic supervision and leadership to its affiliated colleges. Moreover, quality assurance mechanism should be established for colleges.

College Principals (Institutional level) should organize awareness sessions for faculty and prospective teachers regarding the benefits of ICTs (Hassan & Sajid, 2013). Teachers can understand ICTs importance in professional development. It's a virtual mentor for them (Chowdhury, 2012). Teachers should use ICTs as much as they can and share useful web-resources and educational applications with each other. Where qualified teachers are available collegial learning should be used as a tool for mentoring and promoting ICT culture in colleges. E-based assignments, E-portfolio should be preferred instead of paper-based assignments and students' artifacts (Hassan & Sajid, 2013). LMS should be introduced for interactive, collaborative, and real-time learning. IMS should be used for student's attendance, records and data management.

Further research studies are also recommended to conduct with a large sample size including public universities. Students' voices also could be included to get a deep insight into the phenomena under study.

REFERENCES

- Al-Zaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools. *International education studies*, 3(2), 211-218.
- Alharbi, A. M. (2013). *Teacher's Attitudes towards Integrating Technology: Case Studies in Saudi Arabia and the United States* (Masters Theses). Grand Valley State University.
- Ali, M. & Parveen, R. (2013). *Teacher training: Teacher education in transition*. Retrieved July 21, 2016 from: http://ecommons.aku.edu/pakistan_ied_pdck/124

- Alrasheedi, H. (2009). *Information and Communication Technology (ICT): Effects of Gender and Training among Kuwait Teachers* (Doctoral dissertation). College of Education of Ohio University.
- Anderson, J. (2010). *ICT Transforming Education: A Regional Guide*. UNESCO Bangkok.
- Ayesha, R. (2013). *Understanding Pre-Service Teachers' Motivations for Joining Teaching in Pakistan* (Doctoral dissertation). Michigan State University
- Best, J. W., & Kahn, J. V. (2014). *Research in Education* (10th ed.). Boston Pearson Education, Inc
- Bingimlas, K. A. (2009). Barriers to the Successful Integration of ICTs in Teaching and Learning Environments: A Review of the Literature. *Eurasia Journal of Mathematics, Science & Technology education*, 2009, 5(3), 235-245
- Brown, H. (2014). Teachers Attitudes and Confidence in Technology Integration. (Theses, *Dissertations and Capstones. Paper 893*). Retrieved October 19, 2016 from <https://pdfs.semanticscholar.org/0341/ff3578ae8e4acbe7ddc37b68e08a4fa2cbff.pdf>
- Chai, C. S., Huang-Yao, H., & Timothy, T. (2009). Singaporean and Taiwanese Pre-service Teachers' beliefs and their Attitude towards ICT use: A Comparative Study. *The Asia-Pacific Education Researcher*, 18(1), 117-128
- Chowdhury, Md. A. (2012). Teacher Educators' Perspectives of the Introduction of *ICT in Education in Bangladesh*. *Critical Literacy: Theories and Practices*, 6(2), 66-85
- Dilshad, M., & Iqbal, H. M. (2010). Quality Indicators in Teacher Education Programmes. *Pakistan Journal of Social Sciences (PJSS)*, 30(2), 401-411
- Halai, A., & Iqbal, H. M. (2007). *Teacher Status Symposium*. Institute for Education Development- Aga Khan University, Karachi.
- Hassan, T., & Sajid, A. R. (2013). ICTs in Learning: Problems Faced by Pakistan. *Journal of Research and Reflections in Education*. June 2013, 7(1), 52 -64
- Khan, H. (2009). *Becoming a Teacher Educator in Public Sector Institutions in Pakistan: Stories from personal and professional lives* (Doctoral dissertation). *Aga Khan University, Karachi, Pakistan*
- Khan, M., Hossain, S., Hasan, M., & Clement, C. K. (2012). Barriers to the Introduction of *ICT into Education in Developing Countries: The example of Bangladesh*. *Online Submission*, 5(2), 61-80.
- Khurshid, K., Shah, A. F., & Reid, N. (2016). *Information and Communication Technology in Learning Physics at Secondary School Level in Pakistan*. *Bulletin of Education and Research*, 38(2), 135-151.

- Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional *development*. *Computers & Education, 59(4)*, 1109-1121.
- Meleisea, E. L. L. I. E. (2007). The UNESCO ICT in education programme. Bangkok, Thailand: United Nations Educational, Scientific and Cultural Organization.
- Mikre, F. (2011). The roles of information communication technologies in education: Review article with emphasis to *the computer and internet*. *Ethiopian Journal of Education and Sciences, 6(2)*, 109-126.
- Nandwani, S., & Khan, S. Ali (2016). Teachers' Intention towards the Usage of Technology: An Investigation Using UTAUT Model. *Journal of Education & Social Sciences, 4(2)*: 94-114.
- Nisar, M. W., Munir, E., & Shad, S. Ali (2011). Usage and Impact of ICT in Education Sector; A Study of Pakistan. *Australian Journal of Basic and Applied Sciences, 5(12)*, 578-583, ISSN 1991-8178
- NPSTP (2009). National Professional Standard for Initial Preparation of Teachers in Pakistan, available in pdf <http://www.unesco.org.pk/education/documents/step/National%20Professional%20Standards%20for%20Teachers%20in%20Pakistan.pdf>
- Shazia, M. (2000) Factors Affecting Teachers' use of Information and Communications Technology: A Review of the Literature. *Journal of Information Technology for Teacher Education, 9(3)*, 319-342
- Shirvani, H. (2014). Pre-service teachers' attitudes toward using technology in schools. *Journal of Literacy and Technology, 15(1)*, 33-53.
- Tweed, S. R. (2013). "Technology Implementation: Teacher Age, Experience, Self-Efficacy, and Professional Development as Related to Classroom Technology Integration" Electronic Theses and Dissertations. Paper 1109. Retrieved November 4, 2016 from <https://dc.etsu.edu/etd/1109>
- Wan, J. (2009). *Teacher Educators' Computer Technology Integration: At Utah State University* (Doctoral dissertation). Utah State University.
- Yidana, I. (2007). *Faculty Perceptions of Technology Integration in the Teacher Education Curriculum: A Survey of Two Ghanaian Universities* (Doctoral Dissertation). Ohio University.

List of affiliated colleges with the University of Karachi available at <http://www.uok.edu.pk/ac/list.php>

List of STEDA Recognized colleges available at <https://www.steda.gos.pk/>

List of NACTE Accredited colleges available at <http://www.nacte.org.pk/#/accreditation>