



Integration of ICT: The Missing Link in the Pre-Service Teacher Training Program at Karachi, Sindh

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Journal for Educators, Teachers and Trainers, Vol. 13 (4)

<https://jett.labosfor.com/>

Date of reception: 22 Apr 2022

Date of revision: 14 July 2022

Date of acceptance: 25 July 2022

Shireen Azhar, Prof.Dr Hosam, Syed Sohail Ahmed (2022). Integration of ICT: The Missing Link in the Pre-Service Teacher Training Program at Karachi, Sindh *Journal for Educators, Teachers and Trainers*, Vol. 13(4). 297-306.

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ABSTRACT

In this current study, the researcher explores the integration of information communication technology (ICT) in the teacher training program at the pre-service level. The profession of teaching has become a challenging profession ever in our society as knowledge expands very rapidly and dynamically, and it wants teachers to cope with new technologies in their academic activities. Furthermore, ICT can provide an efficient and effective way for teachers' professional development during pre-service and in-service teacher training; hence, this integration can help connect them with the international community. However, it is very unfortunate that instead of a bulk investment of human and financial resources, the pre-service teacher training program cannot provide prospective teachers with the competencies, necessary skills, and job experience to prepare them for using ICT for the future profession. Similarly, in the current paper, we have taken the issues and application of ICT that supports the teacher's pre-service Education for pedagogical skills. Hence, it was concluded that ICT should be the basic tool when selecting and staffing the teachers in these colleges.

Keywords: Information and Communication technology (ICT), Pre-service teacher training, Pedagogical skills, ICT approaches

INTRODUCTION

The application of Information and communication technologies (ICTs) has a deep impact on shaping the infrastructure of Education in a global scenario and in producing dynamic changes in society (Rafique, Mahmood et al. 2022). Within the time limit of the last decade, the application of ICT tools has fundamentally changed the way of thinking people do business and do communicate. With the use of ICT, there has been a transformation in the sectors of agriculture, medicine, engineering, business, and associated fields. In the same way, ICT has much potential to transform the education sector in how and where learning takes place with the amalgamation of ICT and the role of teacher and students in the learning process (Shaikh and Alwi 2022). It is observed that for Education to reap the potential benefit of ICT in the making learning a better opportunity in teacher training as fundamental skills and competencies. Therefore, to achieve these goals, the institution of teacher training needs to develop tactics and strategies to enhance the teaching-learning process within the education program. Moreover, it is observed that teachers are well prepared for future Education with embedded ICT that is well prepared as a unique tool for learning (Raza, Rafique et al. 2015).

It is further observed that the teaching profession has become a challenging activity in our society as knowledge is disseminated rapidly and can be available to teachers and students simultaneously (Hiebert, Gallimore, & Stigler, 2002). Likewise, learning concepts have evolved with the passage of time, facilitating learning attitudes and making it meaningful for individual learners for effective skills. On the one hand, the development of modern innovative, and up-to-date technologies have evolved as new possibilities for the teaching profession. On the other hand, it has placed more demands on teaching learning attitudes concerning teaching skills (Afshari, Bakar, Luan, Samah, & Fooi, 2014). Therefore, due to the rapid growth of ICT tools like the internet, conventional pre-service institutes of teachers' training worldwide are undergoing a huge shift in infrastructure, training content, and course delivery methods (Bansal, 2009; Kats, 2013).

Similarly, information and communication technology (ICT) is integrated with the education scenario as it is evolved from the former terms of information technology (I.T.) which described unique technologies for sharing, transmitting, and manipulating information (Anderson & Baskin, 2002).

Information communication technology is used as digital technology for writing, drawing, printing, and painting. However, after the 20th century, the use of ICT in the shape of television, telephone, and digital media has dominated the public's perception of communication technology. In the current era, ICT is generally defined as technologies that enable creating, gathering, accessing, managing, communicating, and presenting information through digital and electronic means (Ting-Toomey, Oetzel, & Yee-Jung, 2001). Other researchers

like Anderson and Baskin (2002) posited that "the addition of 'communication' to previous terms such as information technology (I.T.) emphasizes the growing importance attributed to the communication aspects of new technologies ."The same has been highlighted in United Nation (U.N.) reports as well by researchers, that ICT cover telecommunications equipment, services, internet equipment and services, broadcasting and media, documentation centers and libraries, information of commercial type providers and network-based, and other associated information's (Oodan, Ward, Savolaine, Daneshmand, & Hoath, 2003).

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2003) uses the term ICTs, to describe: "...the tools and the processes to access, retrieve, store, organize, manipulate, produce, present and exchange information by electronic and other automated means. These include hardware, software and telecommunications in the forms of personal computers, scanners, digital cameras, phones, faxes, modems, CD and DVD players and recorders, digitized video, radio and T.V. programs, database programs and multimedia programs".

LITERATURE REVIEW

The era of information and communication technology (ICT) greatly enriches Education with global technologies and I.T. infrastructure. It makes communication effective, fast, and feasible in all urban and remote areas and helps make this world a global village (Graham & Marvin, 2002; Organization, 2010). Additionally, developing countries like Pakistan use modern technology in business, Education, and government sectors. In the same way, it is highly necessary to apply ICT to its full potential in the education sector to accomplish the highest level of Education (Kozma, 2005).

It is also observed that ICT plays a vital role in educating children regarding computers and their aided technologies. With ICT, teachers learn too much about computer attitudes and associated subjects (Cavas, Cavas, Karaoglan, & Kisla, 2009). The ICT tool at the time of hiring and staffing for required teachers must be effective so that better outcomes can be achieved at the student end performance, as was found by researchers (Hennessy, Ruthven, & Brindley, 2005). Furthermore, for designing an effective ICT-based curriculum, it is dire need of time to hire teachers well acquainted with computer-aided Education and much-needed simulated inputs and outputs as well as desired objectives. It is also found that teacher ICT-embedded training with unique tools can enhance productivity in student performance (Teo, 2008).

Likewise, ICT deeply impacts teaching and training students and teachers, respectively, especially in many projects. In the meantime, it has opened several opportunities for teachers in each domain to avoid confrontation with teaching and learning difficulties (Mumtaz, 2000). In the same way, there is a real test to make changes in the new field of learning with ICT-embedded tools required for teachers with special capabilities. Hence, information communication technologies (ICT) difficulties and complexities are viewed as successful and productive, exceptionally for learning and instructing in a unique way with teacher training issues (Somekh, 2007). In the context of Pakistan, the training of teachers is much charged, and this subject is doing too less for substances of government-funded schools and colleges, the contention of teacher training programs with consistency to school educational programs, common affirmation principles, insufficient assets, and there is the offer for meager quality control mechanism (Mockler & Groundwater-Smith, 2014).

Accordingly, poor handling of ICT tools leads to mismanagement in computer-aided learning technique, and the nature of making ready the training programs has clumsiness as they need agreeableness with the educational system with the requirement of changes in educational programs as these are indicated by the 21st century technological up gradation in the developed world (Whitworth, 2009). In addition, there has been quantitative and qualitative development in history about a number of basic foundations over some time as there is an increasing trend of significant increase of quality training of teachers in these institutes (Elder, Johnson, & Crosnoe, 2003). Pakistan's education sector has remained a depressed area in past decades, especially with the integration of ICT tools as a new drift in technology. Although lab facilities are provided in schools and colleges, these facilities are inadequate concerning student and teacher averages in these institutes (Earthman, 2002). In this technological era, with rapid change in technology and communication sources, there observed a big improvement in the I.T sector, and due to technology, the way out of job performance has changed, introducing an effective, efficient, and better way of job execution (Wheelen & Hunger, 2011).

It is also observed that in every field of life, there are changes in Education, business, management style, and, in the same way, teaching style. Developing a student-centered approach instead of a teacher-centered approach is also the timeline for integrating ICT in student and teacher academic careers (Donnelly, McGarr, & O'Reilly, 2011). However, contrary to past times. Currently, students and teachers communicate with each other all the time via the internet and suitable technology. In this way, they try hard to find considerable solutions timely and coordinately (Mishra & Koehler, 2006).

Moreover, with the invention of new technological tools, teachers and students are not working in isolation, but they work in peer to peer and jointly; in this regard, the teacher encourages the student to participate in all

activities so they can learn better for solving problems (Wentzel & Watkins, 2002). It is only needed in the global era that students should be well equipped with computer-aided tools so that tomorrow's teachers are today's students. Once hiring is good at pre-service, their abilities and skills are enhanced with timely training so that we can cope with the international world (Day, 2002). A few decades earlier, students and teachers worked in a controlled environment and did not have effective channels for readdressing grievances. However, due to effective communication, a strong collaboration is formed between students and teachers in schools and colleges (Mishra & Koehler, 2006).

Likewise, it is found that several teachers in colleges are unable to explore effective and efficient ways to apply information and communication technology in their classrooms due to less awareness and knowledge of computers (Ertmer & Ottenbreit-Leftwich, 2010). The teaching and learning life of the teachers is highly vulnerable due to the dearth of technology in their school curriculum, and hence they cannot cope with innovative class tools (Mumtaz, 2000). Hence, the probable explanations for this lack of success by teachers are that the use of technology in the classrooms is not encouraging and the lack of teacher training with the perspective of ICT as a source of educational sustainability (Ololube, 2006). On the contrary, currently, the integration of teacher training with information and communication technologies (ICTs) has remained a topic of much interest and debate as education systems around the globe are under heightened pressure for the application of unique information and communication technologies tactics in order to learn students skills and knowledge for need in the 21st century (Robin, 2008; Trilling & Fadel, 2009). It was also found that the institution of teacher training is faced with the challenges of preparing a new generation of teachers for effectively using learning tools and teaching practices (UNESCO, 2002).

Consequently, teacher training and education programs are not unaffected much by the penetration of computer-aided technologies.

ICT deeply impacts the quantity and quality of learning, teaching, research, and development (R&D). In conventional and distant educational institutes all over the globe, furthermore, in solid terms, the ICT integration rate has enhanced the learning and teaching methodologies via its dynamic, engaging, and interactive content. In the same way, it has nonetheless provided real-time opportunities for single instruction (Newhouse, 2002).

In the same way, ICT has much potential for enriching, accelerating, and deepening skills for motivating and engaging students in making learning a basic tool that relates to school experience, and workplace practices, helping in creating economic feasibility for ongoing conditions (Steinberg, Almeida, Allen, & Goldberger, 2003). Consequently, ICT helps to contribute to drastic changes in schools and colleges in strengthening learning and teaching that supports linkage between teaching institutions and the world. In addition, ICTs may make Education more productive and efficient as it engenders several tools to increase and facilitate teachers' professional activities (Ololube, 2006; Yusuf, 2005). Other researchers like (Newhouse, 2002) have identified the use of ICT in the life of students, teachers, pedagogies, learning environment, provision of schools with ICT provisions and policies, and desired practices of the organization.

The Education of a teacher is not the only source of providing teachers with the necessary knowledge, experience, and skills to effectively carry out teaching jobs. However, it also helps professional growth (Osunde & Omoruyi, 2004). Likewise, the Education of teachers is the process of imparting training as it deals with acquiring professional growth and competencies. It is a vital exercise that can enhance teaching and learning. Other researchers (Law & Glover, 2000) explored that the Education of teachers is intended to give sensitive, highly motivated, conscientious, and extroverted teachers that can handle students efficiently and effectively with a professional approach to get the best educational achievement.

It was also found that inadequate teachers' preparation is a result of the inability of teachers to demonstrate sufficient knowledge and consideration of the function, structure, and development of the requisite discipline (Ololube, 2007). Hence, it is the need of time that an efficient teacher program would be considered a reliable education program that leads to an increased level of confidence for teachers and students. Therefore, due to this combined effort, learning and teaching practices are coordinated effectively and efficiently, and the inherited problems are solved and rectified immediately.

ICTs and Pre-Service Teacher Education: The Present Position.

Information and communication technology (ICT) and pre-service teacher education have a direct relationship with each other, and they should give much importance by academia and policymakers. On the contrary, it is found that several teachers are unable to explore effective and efficient ways with the applicability of computer-aided technology in the environment of classrooms and with any its related impact on learning and teaching life (Baylor & Ritchie, 2002). In addition, a disadvantage of current pre-service teacher practices of ICT are:

- Only the fundamentals of computers are taught to student teachers.
- Only technical issues are focused on, and nothing is done with pedagogical uses of technology.
- The B.Ed. The syllabus does not cover a sufficient amount of ICTs content.
- The teacher educators present in traditional ways the content of educational technology. They do not show evidence of using new technology to support instructional innovations.

- The student teachers do not know how to use new technology in their classroom instruction.
- The present B.Ed. The syllabus does not provide good practice for student teachers to apply ICT into the curriculum.
- New ICTs and their educational uses are not well introduced to student teachers.
- The design of innovative instruction with the support of new technologies is extremely weak.
- The expertise of student teachers on ICT application in teaching subjects is limited only to 'computer literacy.
- Future teachers are taught only about technology, and old curricula and pedagogical approaches are implemented in the teachers.
- The teacher preparation programs offer educational technology courses, and student teachers only show ICT skills. However, they fail to include ICT in their teaching in a manner that enhances students' learning.

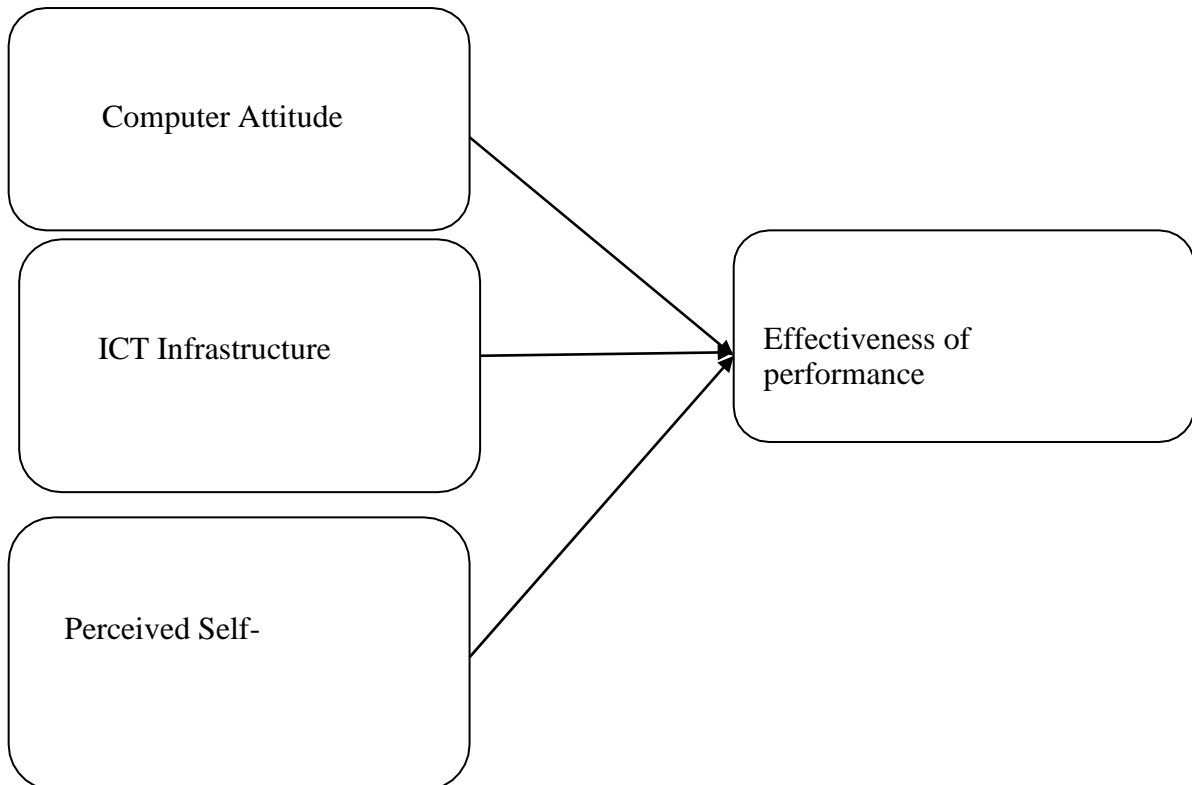


Fig 1: Research framework

- H 1:** Computer attitude has significant impact on effectiveness of performance of Pre-Service teachers.
- H 2:** ICT infrastructure has positive impact on effectiveness of performance of pre-service teacher.
- H 3:** Perceived Self-Confidence in Integrating ICT has significant impact on effectiveness of performance of pre-service teacher.

Research methodology

The current study is descriptive as it deals with the explanation of variables and sub-variables with given items. The research instrument was adopted from the previous studies. Hence, the scale of Computer Attitude adopted by (Tezci, 2010), the scale of Perceived Self Confidence adopted by (Gandhi & Lynch 2016), and the scale of school infrastructure and support adopted by (Rogošić, 2015). The population parameter is the teacher's training institutions of Sindh "Karachi and Jamshoro" as there are a limited number of schools and teachers which impart training to the teachers; hence, there is a total of 200 teacher staff in these two colleges that represent our population.

4. RESULTS AND ANALYSIS

The demographic variable like gender, marital status, age, qualification, and experience was analyzed with the help of a statistical package for social sciences (SPSS) in the form of mean and standard deviation.

Table 4.1: Demographic statistics

Demographic variables	Categories	Responses	Response rate (percent)	Mean	S.D.
Gender	Male	52	55%	.74	.438
	Female	41	46%		
Marital status	Single	32	35%	1.9	0.918
	Married	61	65%		
Qualification	HSS certificate	48	51%	2.535	1.170
	Bachelor and Hon's	8	8%		
	Master and above	25	26%		
	Others	12	12%		
Age	21-29 Years	17	9%	1.57	.548
	30-39 Years	27	29%		
	Above 40 Years	49	50%		
Experience	Less than 2 Years	14	15%	1.75	.883
	2-5 Years	17	18%		
	6-9 Years	11	11%		
	Above 10 Years	51	54%		
Total	93				

Table 4.2: Multiple regression

Model	Significance value	Std Coefficient (Beta)	T- value
Computer attitude	0.001	0.407	3.014
ICT Infrastructure	0.000	0.383	6.516
Perceived self Confidence	0.000	0.613	7.405

Independent Variable: Computer attitude, ICT infrastructure, perceived self confidence

Dependent Variable: Performance of Pre-Service teacher

In the above table, there are statistics of multiple regressions. All three hypotheses were found to have a positive relationship with effective teacher performance at institutes, as illustrated by the sig value. In addition, the standardized beta value shows that the predictor's unit change impacts the criterion variable. In a table, the standardized beta coefficient value of computer attitude with teachers' performance is 0.407, showing that one unit change in the independent variable has a 0.407-unit shift independent variable. Likewise, the standardized beta coefficient value of ICT infrastructure with teachers' performance is 0.383, showing that one unit change in the independent variable has a 0.383 unit shift independent variable.

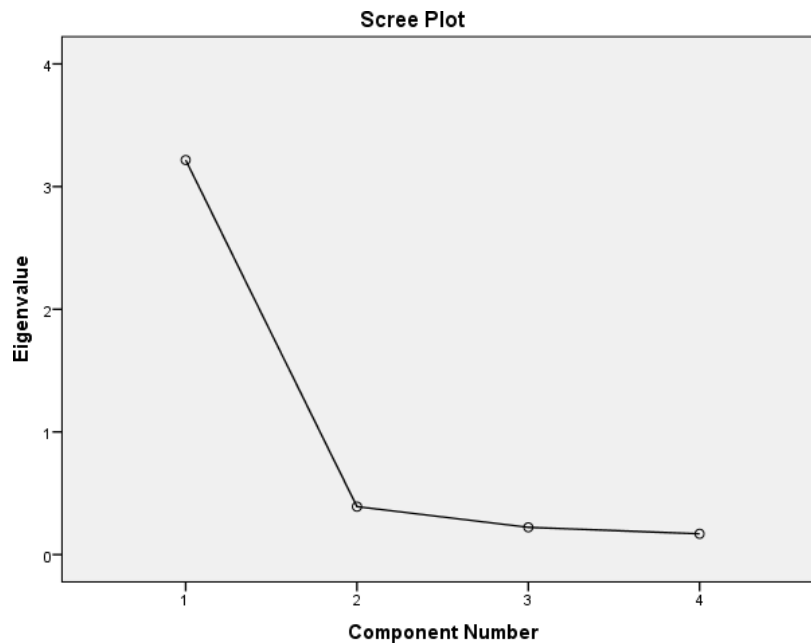
Similarly, the standardized beta coefficient value of perceived self-confidence with teachers' performance is 0.616, and it shows that one unit change in the independent variable has a 0.513-unit shift in the dependent variable. The T value should be greater than 2 for acceptance of the relationship; in this case, all the values are high. Hence, it is stated that computer attitude, ICT infrastructure, and perceived self-confidence have a positive relationship with Pre-Service teachers' performance.

Table 4.3: Exploratory factor analysis (EFA)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.841	
Bartlett's Test of Sphericity	Approx. Chi-Square	273.771
	Df	6
	Sig.	.000

Table4.4

Communalities		
	Initial	Extraction
CA	1.000	.870
SIS	1.000	.769
PSC	1.000	.852
EP	1.000	.726
Extraction Method: Principal Component Analysis		



In the above table, there is an illustration of exploratory factor analysis (EFA) that is used to check the reliability and validity of the instrument. The value of KMO sampling adequacy is 0.841 which shows that sample is valid enough to investigate the relationship between predictors and criterion variables. Likewise, Bartlett's test of sphericity also shows that the sample is significant. In the same way, the commonality factors also explain that instruments of computer attitude, ICT infrastructure, perceived self-confidence, and teachers' performance are reliable and valid concerning statistical rules.

CONCLUSION AND RECOMMENDATIONS

The current study aimed to investigate the integration of information communication technology (ICT) with pre-service teachers' training at the colleges of teachers training in Karachi. Therefore, after analyzing data of teachers, it was found that social, technological, and economic changes of the previous few decades are in a position to make Education and training more vital than ever. An educational system with the perspective of different degrees worldwide is making much struggle to get opportunities of Education for all that is suitable for providing their graduate with the required knowledge and skills for the sophisticated living environment and marketplace and to get ready their citizens for long life learning (Hart, 2013).

In order to cope with these challenges, we have to focus on expanding access concurrently, improving internal and external efficiency, and promoting quality in learning and teaching for improved system management. Hence, it is concluded that teachers are vital for successful learning about ICT integration in teaching practice to improve the standard of college education in Pakistan.

Hence, from the discussion, it is found that in the context of our country, Education is very lacking, especially with the integration of ICT and teacher education. The curriculum of Education does not have much capacity to inculcate ICT in their scenario, and teachers hired through this process do not possess the knowledge and skills concerning teachers worldwide having modern ICT tools. It is recommended that teachers at pre-service institutes have a positive role in order to prepare and equip teachers for classrooms that are competent enough to manage and enforce quality teaching. Hence, it is time to ponder and rethink the current practices of pre-service

education teachers so that modern-day ICT tools can be applied in school and college curricula. Consequently, the following are recommendations for the current study.

- There should be a basic course in the preparation program of pre-service teacher training with the prime objective of providing desired knowledge, skills, and understanding of the sociological and philosophical underpinning of ICT in the education scenario.
- There is a dire need at side of teachers to grow and develop long life learning attitudes and habits that can enhance their teaching and professional knowledge. It should be an ongoing process with day-by-day improvement.
- There must be a commitment on the teachers' side, and they have a firm belief that using technology makes them likely to achieve higher educational goals compared to other used means.
- It is recommended that future researchers should research pre-service teacher training curricula to investigate current problems like pedagogy integration, teacher professional development, curriculum, and teaching models concerning ICT scenarios.
- At the government level, either provincial or federal, there should be strong commitment and determination at all political levels to devise a unified policy. Moreover, the relationship of teachers, students, parents, administrators, planners, policymakers, and officials is to make combined efforts to develop programs that can support the integration programs.

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