

Competence Analysis of Elementary School Teachers with Respect to Effective Communication and Proficient Use of Information Communication Technologies

Tariq Hussain^{*}, Nisar Abid^{**}, and Aqeela Samuel^{***}

Abstract

The study aimed to observe teachers' competence level in Effective Communication and Proficient Use of Information Communication Technologies (ECPUICT). A descriptive cross-sectional survey was conducted on 201 both male and female Elementary School Teachers (ESTs) that were selected from public sector elementary schools of district Lahore through random sampling. The researchers developed an observational check list that consisted of three sub-scales (i.e. Knowledge & understanding, disposition, and performance & skills). The psychometric properties of each subscale showed that the observational checklist is valid and reliable to measure teachers' competence in ECPUICT. Different statistical techniques were applied to analyze the data i.e. mean score, standard deviation, and an independent sample t-test. The findings showed the majority of ESTs are moderately competent in ECPUICT. However, there was a significant gender-based difference in two factors of ECPUICT (disposition and performance & skills) while an insignificant difference in ESTs' knowledge and understanding regarding ECPUICT. Hence, overall a significant difference between male and female ESTs competence level in ECPUICT was found. It is to be suggested that the concerned educational authorities should take steps to enhance the competence level of ESTs by indulging them in different training programs such as seminars, workshops, in-service training, professional development training, etc.

Keywords: Competence, teachers' competence, effective communication, information communication technologies.

^{*} Assistant Professor, Institute of Education and Research, University of the Punjab, Lahore, Pakistan.

Email: tariqedu71@yahoo.com

^{**} Instructor Education, Virtual University of Pakistan. Email: nisar.abid@vu.edu.pk

^{***} Assistant Professor, Govt. Postgraduate College for Women Gulberg Lahore, Pakistan.

Email: aqeela_phd@yahoo.com

Introduction & Background

The investigators believed that quality of education is based on different constructs that are related to teacher and curriculum. These constructors are teachers' knowledge, teachers' qualification, teachers' communication skills, teachers' skills to use technologies, and curriculum (Haider et al., 2015; Tomlinson, 2005). Moreover, Singh (2007) believed that the quality of education depends on the competence of teachers. However, the quality of education seems impossible without having an in-depth subject matter knowledge and pedagogical skills of a teacher. Teachers are considered as change agents that play a significant role to enhance the quality of education while teachers' main role is to transfer knowledge to others. Bhargava (2005) and Agra (2005) stated that students' academic performance, as well as quality of education, depends upon teachers' competence. An effective teacher is loyal to his/her work and would have abilities to communicate, and skills to use technologies (Cruickshank et al., 2005). Hence, Sujathamalinia (2007) assumed that a competent teacher has good subject matter knowledge, abilities to communicate, and skills to use technologies.

Competence depends upon knowledge, skills, and attitudes required to execute throughout the job while teacher competence is the practical skills and proficient abilities needed to transfer knowledge. A teacher is known for his/her competence such as intensive subject matter knowledge, good pedagogical abilities, and skills to use technologies that are helpful to convey the messages (Haider et al., 2015; Kumari & Srivastava, 2005; Levpuscek & Peklaj, 2007; Rychen & Salganick, 2003). A review of related literature showed that studies related to teachers' competence regarding the use of different technologies in education are mostly conducted on prospective teachers. However, few researchers involved instructors (Ozudogru & Cakir, 2014) as well as teachers (Gokcek et al., 2013; Kocaoglu & Akgun, 2015; Sahin & Gocer, 2013) in their studies. Moreover, studies conducted on elementary school teachers' competence regarding the use of different technologies were limited (Baran et al., 2009; Onal, 2014). In this context, considering the recent developments in the information communication technologies field, researchers designed a study to investigate the competency of elementary school teachers with respect to Effective Communication & Proficient Use of Information Communication Technologies (ECPUICT).

Objectives of the Study

1. To observe the effective communication and proficient use of information communication technologies (ECPUICT) competence level of elementary school teachers (ESTs).
2. To investigate the gender-based difference in ESTs competence level regarding ECPUICT.

Research Question & Hypothesis

R.Q 1: What competence level teachers have regarding effective Communication and Proficient Use of Information Communication Technologies (ECPUICT)?

H₀1: There is no significant gender-based difference in ESTs' competence level regarding ECPUICT.

Review of Related Literature

Communication in classrooms is more multifarious and impulsive as compared to other situations (Alberto, 2013; Duta et al., 2015; Jurik, 2014; Kenneth, 2007; Lambrechts, 2013; Panisoara & Panisoara, 2012). However, teachers have a great deal to do with how to communicate in the classroom, transformer knowledge, information, and ideas in a variety of ways (e.g., through speaking, gestures, body language, and written word). Kenneth (2007) believed that students' learning process will not take place efficiently without teachers' effective communication. Thus, teacher shaving effective communication skills can generate a more effective environment for learning. Nevertheless, somebody having effective communication skills has the potential to affect others. Meanwhile, teachers are considered as key agents to acquaint with technologies in educational settings. Integration of technologies would never take place without these change agents, as this obligation is expected essentially by instructors (Stensaker et al., 2007; UNESCO, 2011; Voogt et al., 2013). Teachers obtain pedagogical knowledge and technical skills that are required to integrate technologies into teaching. In other words, teachers have to be technologically and pedagogically competent (Buabeng-Andoh, 2012; Kabakci, Yurdakul, & Coklar, 2014; Okojie et al., 2006; Wastiau et al., 2013). Though, competence is an essential element of teaching if compared with other variables allied to teaching (Chai, 2010; Ertmer et al., 2012; Inan & Lowther, 2010; Knezek & Christensen, 2008; Law & Chow, 2008; Sipila, 2014; Vanderlinde et al., 2014; Wastiau et al., 2013).

An important aspect to attain such technological integration in education teachers must acquire competence to use technologies. From a general viewpoint, competence regarding the use of technologies deliberated teachers' skill to use them (Aesaert & van Braak, 2015). According to Bilbao-Osorio and Pedro (2009), the use of technologies suggests much more than simply theoretically grasping by teachers with the pedagogical use of technologies (Krumsvik, 2014). It is also essential for teachers to use technologies in educational practice because competencies describe the degree to which teachers use technologies in the teaching-learning process. Usluel (2007) conducted a study in Turkey to find out student teachers' information literacy self-efficacy. The researcher conducted a survey study on 1702 student teachers that were selected randomly. The author found from descriptive statistics teacher candidates perceived ICT skills and ICT experience were significant factors for teaching. It was concluded from the t-test, there was a

significant difference in male and female teacher candidates' perceived competence regarding the use of technologies. The author also concluded that training during learning has an important role in increasing information literacy self-efficacy. Usta and Korkmaz (2010) conducted a correlational study to explore pre-service teachers' computer competencies, their perceptions towards usages of technologies, and attitudes toward teaching at Ahi Evran University. The authors conducted a study on 106 pre-service teachers selected from the department of elementary education and social sciences education. They found that pre-service teachers have a higher level of computer competencies and usages of technologies that affected teacher candidates' attitudes towards the teaching profession. Moreover, they found an insignificant difference in the participants from elementary education and participants from social science education.

Zhu et al., (2013) investigate secondary school teachers' core competencies in relation to their innovative teaching performance. The authors explained from literature there are four core competencies such as educational competency, learning competency, technological competency, and social competency. They used a questionnaire to collect data about these four core competencies and found that teachers have moderate competence levels in all core competencies. Furthermore, researchers also concluded that teachers' educational competency, social competency, and technological competency were positively related to their innovative teaching performance. Akgun et al. (2014) examined the Turkish future teachers' perception towards computer-assisted instruction and investigate the gender-based difference regarding computer-assisted instruction. The researchers conducted a descriptive survey to find out the future teachers' perception towards computer-assisted instruction and found that future teachers' perception towards computer-assisted instruction was positive while they concluded from the t-test there was no significant gender-based difference in teachers' perception regarding computer-assisted instruction. Consequently, Baturay et al. (2017) made a study to explore the relationship among pre-service teachers' computer competence, attitude towards computer-assisted education, and intention of technology acceptance. The researchers revealed a significant positive association among attitude towards computer-assisted instruction, computer competence, and intention to technology acceptance in teaching.

However, in a local context, Shakir and Abeeb (2014) observed the performance of the teachers in the classroom and found a little variation in three levels slightly aware, somewhat aware, and moderately aware as 26.00% of teachers were slightly aware, 33.20% somewhat aware, and 29.20% moderately aware. The researchers also concluded a significant difference between male and female teachers' competencies. Moreover, Haider et al. (2015) observed Elementary School Teachers' (ESTs) competence, working in public sector schools of district Lodhran, Punjab, Pakistan. The researchers concluded from a descriptive survey most of the ESTs were slightly aware regarding competence explained in National Professional Standards for Teachers (NPST) in Pakistan. While

they found a significant gender-based difference in teachers competence explained in NPST in Pakistan. Subsequently, Hussain, Abid, and Butt (2018) conducted a study to discover teachers' and students' perceptions about the use of Information and Communication Technologies (ICTs) at the university level. They used a qualitative survey method through a semi-structured interview that was conducted from eight teachers and sixteen students. The researchers found that multimedia, projectors, computers, laptops, and LEDs were frequently used to enhance the teaching-learning process. Moreover, teachers also believe that ICTs can promote through the use of technologies in the teaching-learning process.

Research Methodology

The positivism paradigm (quantitative approach) was adopted, while the cross-sectional descriptive research design was used to conduct the study. The population comprised all ESTs working in elementary schools of district Lahore that existed in two strata i.e. boys' and girls' elementary school. According to the census of the school education department Punjab (2016), there are 218 (90 male and 128 female) elementary schools in district Lahore while the working ESTs in elementary schools were 753 (355 male and 398 female). A two-stage random sampling technique was used, firstly 25% of schools were nominated from each stratum (23 male and 32 female) through proportional stratified random sampling. Subsequently, an average of four ESTs was chosen from each selected school through random sampling. Hence, the sample comprised 220 ESTs (92 male and 128 female). An observation checklist was developed by the researchers, based on previously classified levels of teacher accreditation by the Policy and Planning Wing, Ministry of Education, Government of Pakistan in cooperation with UNESCO. To measure the teachers' Effective Communication and Proficient Use of Information Communication Technologies (ECPUICT), the observational checklist was further divided into its predefined subscales (i.e. Knowledge and Understanding, Disposition, and Performance & skills). The checklist was developed on five-point Likert-type rating scales ranging from 'unaware' to 'extremely aware'. The scoring and interpretation of the observational checklist are given below in table 1.

Table 1

Scoring Description and Interpretation of Observational Checklist

Level	Rating	Description
Level-0	Not Demonstrated/ Unaware	A teacher does not have competency.
Level-1	Emerging/ Slightly Aware	A teacher faces difficulty to demonstrate competency.
Level-2	Developing/ Somewhat Aware	A teacher did a satisfactory job to demonstrate competency.
Level-3	Proficient / Moderately aware	A teacher did a good job to demonstrate competency.
Level-4	Accomplished / Extremely Aware	A teacher did an excellent job to demonstrate competency.

Psychometric properties of the observational checklist were made sure to ensure validity and reliability. Three educationists and assessment experts ensured the structure, usability, and appropriateness of the observational checklist for measuring teachers' competence in ECPUICT. However, to ensure reliability (internal consistency and composite reliability), a pilot study was conducted on 45ESTs that were selected conveniently from the targeted population. A total of five items were deleted, as $\lambda < .5$, to improve the reliability. The Cronbach's alpha (internal consistency and composite reliability) values of each subscale ranged from .786 to .891 which indicates good reliability (Bonett & Wright, 2015) to measure teacher's competence in ECPUICT. Psychometric evidence (validity and reliability), exhibits that an observational checklist is a reliable instrument to determine teacher's competence in ECPUICT. After ensuring the psychometric properties of the observational checklist researchers personally visited the 55 selected elementary schools with the kind permission of relevant authorities (School principals and class teachers). Researchers themselves observed the ESTs competence through participant observation because before observation they took permission from teachers through their consents. While 19 out of 220 ESTs did not give the consents so the researchers observed 201 ESTs.

Data Analysis and Interpretation

Descriptive and inferential statistics were applied through Statistical Package for Social Sciences (SPSS) software to analyze the collected data. Percentage, Mean score, Standard deviation, Skewness, and Kurtosis were calculated by applying descriptive statistical techniques. However, Independent samples t-test was applied to investigate the gender-based difference in ESTs competence regarding ECPUICT through inferential statistical technique.

Result of Descriptive Statistics

R.Q 1: What competence level teachers have regarding Effective Communication and Proficient Use of Information Communication Technologies (ECPUICT)?

Table 2

Teachers' Knowledge and Understanding Related to ECPUICT

Response	<i>M</i>	<i>SD</i>	Skew	Kurtosis
1 Practice clear verbal communication during teaching	2.81	0.813	-1.417	1.812
2 Exhibit non-verbal communication in teaching	2.43	1.041	-.914	2.085
3 Use written communication during lecture	2.21	1.712	-1.861	2.071
4 Operate educational technologies during lecture	2.19	1.528	-.843	1.182
5 Use diverse A.V. Aids	1.91	1.242	-1.542	1.613
6 Exhibit rise and fall in voice while teaching	2.78	1.312	-1.894	1.519

Results show that most of the teachers have a good competence level in clear verbal communication and exhibited good rise and fall in their voice during teaching as the mean score ($M=2.81$; $SD=0.813$, 2.78 , $SD= 1.312$) of both competencies was high among other competence. However, teachers face difficulty while using A.V Aids effectively in the class as the mean score of this competency was least among other competence $M=1.91$, $SD=1.242$. The skewness and kurtosis values demonstrate that data met the assumptions of normality as George and Mallery (2010), Hair et al. (2013) suggested skewness values generally between (+/-2) and kurtosis values between (+/-3).

Table 3
Dispositions of ESTs Related to ECPUICT

Response	<i>M</i>	<i>SD</i>	Skew	Kurtosis
1 Appreciate the cultural values	2.76	0.712	-1.817	1.729
2 Active listener	3.07	0.821	-1.143	1.531
3 Respond appropriately to all students	2.64	0.752	-1.916	2.115
4 Encourage diversity of opinions among learners	2.53	1.305	-1.429	1.832
5 Enhance students' learning through technologies	2.17	1.428	-0.928	1.193
6 Exhibits eye contact during teaching	2.74	1.145	-1.643	2.191

Results illustrate that most of the teachers are active listeners because they respond actively to their students during the time of observation as the mean score ($M=3.07$; $SD=0.821$) of active listener competency was higher among other competence. Nevertheless, teachers face difficulty to enhance students' learning through technologies as the mean score ($M=1.91$, $SD=1.242$) was the least among other competence. The skewness and kurtosis values demonstrate that data met the assumptions of normality as George and Mallery (2010), Hair et al. (2013) suggested skewness values generally between (+/-2) and kurtosis values between (+/-3).

Table 4
Performance and Skills Regarding ECPUICT

Response	<i>M</i>	<i>SD</i>	Skew	Kurtosis
1 Speak clearly in native language	2.91	0.319	-0.971	2.192
2 Engage him/herself in activities to model effective communication strategies	2.39	0.192	-1.403	1.923
3 Engage him/herself in activities to model questioning techniques in conveying ideas	2.48	0.398	-1.061	1.536
4 Engage him/herself in activities to model questioning techniques in stimulating critical thinking	2.01	1.401	-1.534	1.964
5 Speak in a way that demonstrates sensitivity to culture	2.12	1.053	-1.238	1.324
6 Engage him/herself to give homework/assignment	2.64	1.011	-1.734	2.019
7 Clarify objectives of teaching to students	2.36	1.131	-1.739	1.593

The mean scores indicate that majority of the teachers speak with their students in the native language as $M=2.91$; $SD=0.319$ was higher among other competence related to the performance and skills scale of ECPUICT. On the other hand, teachers face difficulty to engage them self in activities to model questioning techniques in stimulating critical thinking as mean score ($M=2.12$, $SD=1.053$) was least among other competence. The skewness and kurtosis values demonstrate that data met the assumptions of normality as George and Mallery (2010), Hair et al. (2012) suggested skewness values generally between (+/-2) and kurtosis values between (+/-3).

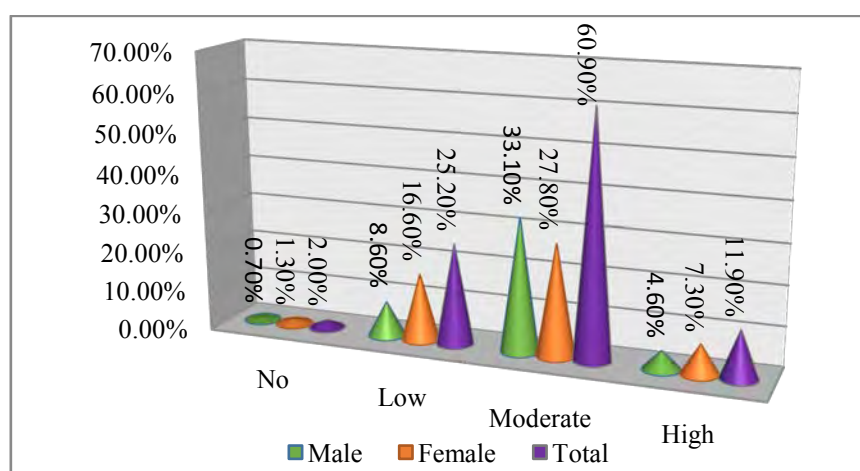


Figure 1: Level of ESTs' competence based on ECPUICT

The figure specifies that most of the ESTs were found at a moderate level (69.90%) during observation which means that teachers were moderately competent in ECPUICT. However, limited numbers of teachers were at the desired level.

Result of Inferential Statistical

H_{01} : There is no significant gender-based difference in ESTs' competence level regarding ECPUICT.

Table 5

Gender-based Difference in ESTs' competence in ECPUICT

	Male(94)		Female(107)		<i>t</i>	<i>P</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Knowledge and Understanding	15.53	3.431	15.71	4.341	0.921	0.766	0.046
Dispositions	17.67	3.176	14.61	4.073	2.231	0.019*	0.838
Performance and Skills	19.29	4.073	17.17	5.270	2.753	0.048*	0.450
Overall ECPUICT	52.49	10.693	47.49	13.684	2.561	0.052*	0.407

Note: $N=201$; $df=199$; d =Cohen's d ; and $*=p<0.05$.

The results of t-test shows that there was significance difference in male and female teachers' competence in two factors of Effective Communication and Proficient Use of Information Communication Technologies (i.e., dispositions and performance & skills) and overall ECPUICT as $t(199) = 2.231, p = 0.019$; $t(199) = 2.753, p = 0.048$ and $t(199) = 2.561, p = 0.052$ respectively which were less than alpha 0.05. However, there was an insignificant difference in male and female teachers' knowledge and understanding regarding ECPUICT as $t(199) = 0.921, p = 0.0766$ which was greater than alpha 0.05. The values of Cohen's d shows small to large effect size (Albers, 2017; Fallon, 2016; Hinton, 2014) as $d = 0.046, 0.838, 0.450, 0.407$ respectively. Therefore, results concluded that variable gender influences teachers' competence in ECPUICT.

Results and Discussions

A descriptive survey was conducted on Elementary School Teachers (ESTs) to observe their competence level in Effective Communication and Proficient Use of Information Communication Technologies (ECPUICT). The results of descriptive statistics exhibited that majority of ESTs were moderately competent in ECPUICT as the findings support the results of Haider et al. (2015). They found that ESTs of district Lodhran have a moderate competence level in National Professional Standards. Meanwhile, Zhu et al., (2013) revealed that secondary school teachers have moderate competence levels in all core competencies (i.e., educational competency, learning competency, technological competency, and social competency). Meanwhile, a significant difference was found in male and female teachers' competence in ECPUICT. These findings also support the previous studies' findings as Shakir and Adeeb (2014) and Haider et al. (2015) who concluded that a significant difference existed between male and female teachers' competence in ECPUICT. Moreover, Usluel (2007) found a significant difference in male and female teacher candidates' perceived competence regarding the use of technologies. However, Akgun et al. (2014) found no significant gender-based difference in teachers' perception regarding computer-assisted instruction. While Usta and Korkmaz (2010) found an insignificant difference in the participants from elementary education and participants from social science education.

Conclusions

The quality of education is based on teachers' competence level. Therefore, the competence of teachers is determined all over the world. This study's aims were to observe Elementary School Teachers' (ESTs) competence with respect to Effective Communication and Proficient Use of Information Communication Technologies (ECPUICT) and to investigate the difference between male and female teachers' competence in ECPUICT. It is concluded from results that teachers are moderately

competent in ECPICT. However, there was a significant gender-based difference in ESTs competence level in two scales of ECPICTs (i.e., disposition and performance & skills) and overall competence in ECPUICT. However, an insignificant difference was found in male and female teachers' knowledge and understanding regarding ECPUICT. It is also concluded that variable gender influences teachers' competence in ECPUICT.

Recommendations

Based on results several recommendations are drawn. Firstly, during the process of teachers' recruitment, the competence should be given preference over marks and degrees. Unfortunately, our education system focuses on marks and having no concepts of competence in teachers' recruitment. Secondly, government should take steps to improve teachers' communication skills as well as the skill to use technologies by arranging seminars, workshops, in-service training, continuous professional development training, etc. Moreover, the present study was conducted on ESTs of Lahore, so it is suggested for future investigators to conduct studies on the ESTs of other districts of Punjab to know the status of teachers' competence, which may facilitate better decision making for the development of education in Pakistan. Fourthly, this study was based on the observation of teachers likewise future researchers should consider the student performance to investigate the impact of teachers' competence on student achievement. Lastly, in-service teachers are the most significant part of this research. Therefore, it needs to study the effect of in-service teachers' competency differences on variables e.g. salary, school type (public and private), gender, age, qualification, etc.

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