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An Assessment of Secondary School Teachers' Performance and Skills in ICTs in Accordance with National Professional Standards Pakistan

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Abstract

The main objective of the study was to explore teachers' performance and skills regarding the applications of ICTs in accordance with National Professional Standardsfor Teachers in Pakistan designed by the Ministry of Education (MoE) Pakistan. This is a current and burning issue in Pakistan and MoE always take feedback from teachers through rapid assessments regarding its practical applications in teaching process.From the targeted populations, 316 teachers (158 each from private and government secondary schools) were selected purposefully to collect the required data. For this, a questionnaire and a MCQs based test was constructed to assess teachers' current practices and skills in the utilizations of ICTs personally and professionally. From the calculated results it was found and concluded that government school teachers were provided trainings for ICTs utilization in teaching learning process; private school teachers female have in-depth content based ICT knowledge, computer, printer, internet and social media were in personal use rather than professional; highly positive correlation was found between self-efficacy and content based knowledge test.

Keywords: Assessment, teachers, ICTs skills, attitude, self-efficacy,

Introduction

Educational standards set parameters to achieve specified educational goals. These parameters cover knowledge, skills and competencies of teachers who are responsible for educating and training students so that they could serve their country effectively and efficiently. To compete international standards of education, government of Pakistan is vigilantly facilitating and fundingfor improving status of education as per the requirements and demands of the 21st century teaching and learning process. Regarding the quality and standards of education, our great and supreme leader Quaid-e-Azam addressed in National Education Conference (1947) and expressed that the importance and type of education cannot be over-emphasized.Because the future of the state highly depends on education being provided to our children which are

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future citizens of Pakistan. Our Quaid further highlighted that we should not forget that we have to compete with the world which is moving very fast in this direction.

Effectiveness of ICTs in improving quality and standards of the education has been accepted world widely. Effective teachers are core element in education to integrate ICTs in teaching - learning process (Agostinho, Oliver, Harper, Hedberg, & Wills, 2002). Therefore, it is important to understand that teachers themselves must be competent and confident in the use of ICTs. At school level, mostly the teachers are demanded to be skilled in using word processor, internet, file management, email handling and management, preparing presentations and analyzing data through excel worksheets (same ICT sources were tested in the underlying research) (Strong, 2011). Mostly these competences were found to be affected by gender, age, teaching experiences and school type (Egwali & Igodan, 2012; Milanowski, & Odden, 2006). To cope with this challenge, Government of Pakistan has taken initiative of merging ICTs within the curriculum in schools. For thisMinistry of Education in collaboration with USAID have had provided training sessions in order to train all the government school teachers at elementary and secondary levels throughout the Punjab. In these sessions, teachers were provided basic skills to handle and integrate ICTs in their teaching – learning process effectively.

The next step to integrate ICTs in education successfully was developing National Professional Standards (NPS) for teachers in Pakistan by the same agencies i.e., Policy and Planning Wing of the Ministry of Education (MoE), along with the cooperation of UNESCO and USAID under the project of PreSTEP during 2008 to 2012. The National Education Policy 2010 recognized these standards as striving force in improving quality of educationin foundation classes i.e., from 'Katchi' to 'class 10th'. Good teaching is probably the most critical part of solid education. It was highlighted in the

National Educational Policy 2010 that we cannot produce good students without having skilled and qualified teachers in the schools whichareprimarily responsible to achieve the NPS for teachers in Pakistan. It was found from the document of NPS for Teachers in Pakistan (2009) that government of Pakistan has made strategies to improve the quality of education at all levels of education. In this document ten different standards are presented which were drawn in 2009 by the Policy and Planning Wing, Ministry of Education, Pakistan. Out of these ten standards, researchers selected 7th standards which were related to the attitude, required skills and applications of ICTs by teachers professionally. To implement and bound teachersfor this standard, Government of Pakistan has providedtraining to all elementary and secondary schools teachers. These training will enable them to utilize ICTs based resources in their teaching – learning process. Basically this standard provided directions regarding ICTs based teaching, curriculum enrichment, assessment and evaluation of learning outcomes. Knowledge and understanding, dispositions, performance and skills were three different stages within the given standard. In the short period of time and limitedly available resources, it was not possible to explore the applications of this standard at all of these 3 stages. Therefore, this research will cover and analyzed teachers' performance and skills in accordance with National Professional Standards of ICTs.

Review of Literature

Teachers require many educational and didactical skills to transform knowledge and information to the students at elementary and secondary level. At this level students are interacting with new theories, concept-based learning and experimenting different scientific and technological devices at this level. Now, teachers' role has been shifted from "instructor" to facilitator". They are also teaching in new learning environments from the one we are familiar with; now they must have to cope with many more uncertainties. Because of these uncertainties and rapidly changing teaching environment, teacher should

acquire specific skills, like creativity, flexibility, logistic skills, skills for working in projects, administrative and organizational skills, collaborative skills and ICTs based teaching skills (Jager & Lokman, 1999). ICTs supports both teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self-responsibility for learning such as distance learning, motivate teachers and students to continue using learning outside school hours, plan and prepare lessons and design materials such as course content, constructing new knowledge and facilitate sharing of resources, expertise and feedback (Ali, Haolader, & Muhammad, 2013; Egwali, Igodan, 2012). ICTs based teaching has altered traditional teaching methods and is capableto engage students in classroom activities which improve their achievement and also helps them in solving complex problems to enhance their cognitive skills.

Adebayo and Fagbohun (2013) expressed that ICTs is now an essential tool to promote educational system in this era. It has not only greatly influenced educational system but impending to meet the learning needs byproviding wide access of educational resources; increase self-efficacy and self-paced learning opportunities among students. Not only has this, ICTs also improve teachers' professional development process. Adebayo and Fagbohun surveyed to assess computer and ICT skills among secondary school teachers in Ota Ogun state. In this study total 68 secondary school teachers participated in which 32 (47.06%) were male and 36 (52.94%) were female. Demographically these were having different academic qualifications, trainings and inclination towards using ICTs. At the end of this study they concluded that although the majority of the sampled teachers were ICT literate but government in conjunction with MoE should ensure that computer and ICT trainings to inculcate curriculum of teacher training schools.

Badau and Sakiyo (2013) added that teachers' performance regarding ICT based teaching-learning is largely based on their skills, attitude and

competencies. While Mavellas, Wellington and Samuel (2016) extended these factors by saying that lack of qualified teachers, shortage of electricity, inadequate number of computers system, higher prizes for ICT resources, computer phobia of both teachers and administrators, lack of clear stated digital curriculum, political factors, poor timing and planning, and forcing teachers to use technology in the classroom without giving them ample time to learn, technology appropriately are the reasons of failure in achieving learning goals. To achieve international goals set by different organizations (i.e., Millennium Development Goals (MDGs), Education for All (EFA), and World Summit on the Information Society (WSIS)) require substantial investment on teacher trainings for ICTs (Toit, 2015). Developing countries provide computer literacy based teacher trainings for integrating ICT in education; but effective training should not be limited at computer literacy but also include model effective teaching practices to bring this objective in existence. Jegede (2009) identified a problem that currently processed teachers training programs don't support teachers and administers to integrate ICTs classrooms. Practically,mostly teacher were using Internet and word processing software in few cases in teaching – learning process. Thus the objective of teaching with ICT in Primary and Secondary Schools might not be possible to achieve. The most critical factor in the successful integration of ICT into education is the extent to which teacher educators are able to prepare teaching materials by utilizing ICTs effectively. For this, MoE has prepared National Professional Standards of ICTs for school teachers. By following these standards, we can develop ICTs based teaching-learning culture successfully in schools. The objectives of this study were as under:

1. To probe teachers' awareness about National Professional Standards for Teachers in Pakistan.
2. To search about the availability and accessibility of ICTs based resources for/by teachers either at their home and school.

3. To discover teachers' self-efficacy regarding the utilization of ICTs based resources for their personal and professional purposes.
4. To explore teachers' attitude/opinion/belief regarding the applications of ICTs based resources in classes according to Standard 7(C) in National Professional Standards for teachers in Pakistan.
5. To weigh teachers' performance through knowledge-based test about basic applications of computer and internet (based on the trainings given by the Government of Pakistan).

To conclude this research, following research questions were drawn:

1. What is the relationship between teachers' self-efficacy regarding ICTs based teaching and their knowledge – based – performancein the same subject?
2. What is the relationship between teachers' attitude toward ICTs based teaching and their knowledge – based – performance in the same subject?
3. What is the relationship between teachers' self-efficacy and attitude towards ICTs based teaching?

Research Methodology

Methodologically it was a descriptive but correlational research, which describes present phenomena of the concerned issue. Descriptive research supports in collecting and tabulating factual data to make comparisons and understanding existing relationship between the variables (Cohen, Lawrence & Morrison, 2000). All those male and female teachers who were currently offering their services in all the private and government secondary schools of the Multan city constituted population of this study. Total 55 private registered and 160 government secondary schools exist within the Multan city. Total 3812 teachers were appointed in government schools and 1786 teachers were offering their duties in private schools. It was fairly difficult to select suitable sample from the overall population to generalize the result. Therefore, 8 government and 8 private schools were delimited based on the following

reasons: (1) these schools are larger in terms of its area and students' enrollment, (2) faculty appointed were higher as compared to others and (4)renowned and popular among the local people of Multan city because of the students' achievement in their annual examinations results. Following table showed the list of overall contemporary male and female teachers constituted the targeted population of this study (school names were kept in secrete because of ethical commitments during data collection). Convenience based sampling method was considered to be the most suitable method for this study. It was not possible for researchers to select teachers randomly due to their tough working schedule. Therefore,all those teachers who were agreed to respond the researchers were taken as the sample of this study. Demographically sampled teachers were distributedas under:

Research Instruments

Two different research instruments were designed based on the review literature to collect the relevant data from the targeted population. A questionnaire was designed which was comprised of FIVE different sections as: (I) demographic information about the targeted population, (II) secondary school teachers' awareness about NPS, (III) frequencies about available and accessible ICTs resources at home and/or institution, (IV) teachers' self-efficacy ratings about utilization of ICTs based resources and (V) and their attitudes regarding the applications regarding the ICTs in teaching and learning process. Part II and III were of dichotomous format; Part IV was a 4-point rating scale and Part V was based on 5-point Likert Scale. A test comprised of fifty two (52) MCQs (Multiple Choice Questions) was constructed to assess teachers' knowledge and skills regardingbasic applications of computer and internet professionally.Content for the construction of this test was taken from the manual provided to all the teachers during their professional training (i.e., Pre-STEP Training sessions) sponsored by USAID.

To validate the research instruments, researchers consulted few experts locally available in the higher educational institutions. By keeping in view theirsuggestions, some of the items were replaced by new onesand format were finalized before the pilot study. At this stage, authors distributed questionnaires between 20 (i.e., 10 each from government and private secondary schools) teachers. In the light of their responses and quires, few statements were revised and in certain cases, minor adjustments were made. Necessary sequence was re-arranged before the final administration of the tool. In case of test, "Item Difficulty Index" was calculated at p value 0.50. As a result, 10 easiest and 12 difficult items were removed from the test. Remaining 20 items were finalized to measure teachers' skills in the area of ICTs.

Results and Discussion

***Objective 1**: Teachers' awareness about National Professional Standards for Teachers in Pakistan*

Table 1: Teachers' Awareness about NPS for Teachers in Pakistan

Statements NPS for Teachers	Yes		No	
	Gov. (%)	Pvt. (%)	Gov. (%)	Pvt. (%)
I'm known about NPS for Teachers in Pakistan.	123 (79.4)	93 (58.9)	32 (20.6)	65 (41.1)
I believe that these standards can improve our educational standards.	121 (78.1)	102 (64.6)	34 (21.9)	56 (35.4)
Our government is providing resources to implement these standards.	94 (60.6)	67 (42.4)	61 (39.4)	91 (57.6)
Our government is changing their policies day by day to implement these standards.	102 (68.5)	62 (39.2)	47 (31.5)	96 (60.8)
Teachers have been provided trainings to achieve these standards.	101 (64.3)	70 (44.3)	56 (35.7)	88 (55.7)
I'm personally trying to improve my teaching practices by following these standards.	125 (80.6)	93 (58.9)	30 (19.4)	65 (41.1)
I'm following ICTs standards of Pakistan to implement technologies in my	109 (71.2)	77	44	81(51.

Statements NPS for Teachers	Yes		No	
	Gov. (%)	Pvt. (%)	Gov. (%)	Pvt. (%)
classroom effectively.		(48.7)	(28.8)	3)

From table 1 it was found that about 80% of the sampled government teachers were known about NPS and they were trying to improve their teaching practices by following these standards (81%) of ICTs (71%). They also believe that these standards could improve overall quality of education (78%) because their government is changing their policies day by day to implement the standards (66%). In case of private school teachers, 59% were known but they express that their schools' rules and regulationsare totally different than to government school systems, so they were following their rules and standards. Therefore, there responses were based on their personal experiences rather than their professional experiences.

***Objective 2**: Availability and Accessibility of ICTs at Home& School*

Table 2: Responses Regarding the Availability and Accessibility of ICT

ICT Tools	Government		Private	
	At Home	In School	At Home	In Schools
	(%)	(%)	(%)	(%)
Computer	134 (85.9)	144 (93.5)	146 (92.4)	151 (95.6)
Printer	53 (33.5)	140 (92.1)	56 (35.4)	125 (79.1)
Scanner	31 (20.9)	81 (54.7)	33 (20.9)	100 (63.3)
Digital camera	42 (28.4)	43 (28.3)	55 (34.8)	26 (16.5)
Multimedia Projector	-	85 (55.9)	-	22 (13.9)
Internet	104 (65.8)	138 (90.8)	116 (73.4)	136 (86.1)
Email	103 (65.2)	140 (93.3)	116 (73.4)	128 (81.0)
Interactive white board	-	106 (69.7)	-	8 (5.1)
Mobile phone	148 (96.1)	-	153 (96.8)	-

ICT Tools	Government		Private	
	At Home	In School	At Home	In Schools
	(%)	(%)	(%)	(%)
MS Word	78 (52.0)	137 (92.6)	123 (77.8)	140 (88.6)
MS Excel	70 (46.1)	-	118 (74.7)	-
MS Power Point	70 (46.1)	-	108 (68.4)	-
Face Book or any other	124 (80.5)	-	106 (67.1)	-
Skype	89 (59.3)	-	71 (44.9)	-
WhatsApp, Viber, etc.	89 (59.3)	-	73 (46.2)	-

From Table 2 it was found that a good majority of teachers from both private and government schools reported that they were having computer, printer, internet and mobile at their home and schools. But majority of teachers from private schools were utilizing MS Office (i.e., MS Word, MS Excel and MS Power Point) for their personal and professional point of view. The only key difference was found in the responses of teachers was about Interactive White Boards. A good majority of government teachers accepted that they can confidently use interactive boards at their schools.

Objective 3*: Teachers' Self – Efficacy regarding utilization of ICT Tools*

Table 3: Teachers' Self-Efficacy Regarding the Utilization of ICT y

Sampled Teachers	N	Personal Utilization				Professional Utilization			
		Avg.	STD	Min	Max	Avg.	STD	Min	Max
Overall	316	31.44	11.86	10	60	22.13	9.37	14	55
Overall Female	209	30.75	12.19	10	60	22.07	9.84	14	55
Overall Male	107	32.79	11.10	15	54	22.27	8.44	15	52
Gov. Female	101	29.20	12.69	10	60	22.16	9.97	14	55
Pvt.	108	32.19	11.57	16	54	21.98	9.75	15	45

Female									
Gov. Male	57	36.01	11.21	15	48	24.45	8.09	15	50
Pvt. Male	50	29.12	9.86	17	54	19.78	8.21	15	52

From Table 3 it was depicted from descriptive statistics that overall Male teachers were more confidently utilizing ICT tools in teaching process than to the overall female teachers (i.e., Avg. = 32.79 > 30.75; STD = 11.10 > 12.19). Specifically, male teachers from Government schools were highly confident in utilizing ICTs in their personal (Avg. = 36.01) and professional (Avg. = 24.45) practices. Between these two findings, the value of standard deviation (STD) showed that they were more interested in utilizing ICT tools in their profession life (STD = 8.09) because the values were found more centralized and the range (Max – Min = 50 – 15 = 35) was also higher than to the STD and range value of personal use. On the other hand, descriptive statistics showed that female teachers from Private schools were more confident and interested in utilizing the ICT tools in teaching practices than to female teachers from government schools (i.e., Avg. = 32.19 >29.20). significant differences between minimum and maximum values and STD results could also verify the same results.

***Objective 4**: Teachers' Attitude towards Utilization of ICTs*

Table 4: Teachers' Attitude towards ICTs Based Teaching

Sampled Teachers	**N**	**Attitude Scale Descriptive Statistics**			
		Avg.	**STD**	**Min**	**Max**
Overall	316	52.64	9.99	19	74
Overall Female	209	51.94	9.68	19	74
Overall Male	107	53.65	9.33	34	73
Gov. Female	101	51.97	10.91	19	74
Pvt. Female	108	51.92	8.43	35	73
Gov. Male	57	57.36	9.21	36	73
Pvt. Male	50	49.42	7.54	34	68

Table 4 explored that the overall sampled teachers were positively (Avg. = 52.64) inclined towards ICT based teaching. But, government male teachers were highly motivated towards the same (i.e.,

Avg. = 57.36, STD = 9.21).no significant differences could be tranced from the results of female teachers categories.

Objective 5*: Teachers' Performance through Knowledge Based Test of ICT*

Table 5: Teachers' Performance in Knowledge Based Test of ICT

Sampled Teachers	N	Test Performance Descriptive Statistics			
		Avg.	STD	Min	Max
Overall	316	9.09	3.66	1	20
Overall Female	209	9.44	3.50	2	20
Overall Male	107	8.41	3.86	1	19
Gov. Female	101	8.88	4.07	2	20
Pvt. Female	108	9.98	2.80	4	16
Gov. Male	57	7.29	3.58	1	18
Pvt. Male	50	9.68	3.81	3	19

Table 5 showed that the overall teachers' performance in test was satisfactory. But the average values in the test of female teachers from private schools (i.e., 9.98) were comparatively more skillful in utilization of ICT tools in teaching process than to others. The STD value of the same category teachers was also minimum which verifies the intelligence of female teachers from private schools. Minim average scores were found in the category of male teachers from government schools (i.e., 7.29) showed their least interest in the knowledge based test.

Table 6: Co-Relation Co-Efficient between the Variables

	Test Scores	Self-Efficacy	Attitude
Test Scores	1	0.381	0.128
Self-Efficacy		1	0.345
Attitude			1

Table 6 showed that the relationship between all the three variables is positive which means they are correlated on each other in same direction. The highest correlation was found between test scores and self-efficacy, which

means if someone have content based knowledge then he/she could utilize ICT based tools more effectively professionally.

Conclusion

From the above results it was concluded that overall majority of secondary school teachers were skilled in handling ICTs based tools either for personal or professional purposes. Secondly, all the government teachers were aware of the NPS for teachers in Pakistan and they were practically carrying the same in their teaching practices under the umbrella of these standards. Computer, printer, internet and mobile phones were not only available but also accessible – personally and professionally – by all the sampled teachers from all government and private sector schools. But teachers from private schools were one step ahead than to government teachers in terms of utilization of MS Office skillfully and successfully in their professional life. Social media and mobile phone applications (i.e., WhatsApp, Viber, and Face Book) were most popular among teachers but were limited for personal use. Male teachers from government sector were found to be more enthusiastic and confident in ICT based teaching practices. While comparing female teachers, it was found that private sector female teachers were keenly interested and utilizing the same professionally with confidence. Overall, all sampled teachers were positively inclined towards ICT based teaching but male teachers from government schools were comparatively more interested in the same directions. But female teachers from private schools took lead in the test performance and got highest marks in the test. Moreover, it was found from results that content based knowledge could improve one's self-efficacy strengthen.

To implement National Professional Standards of ICTs in schools successfully, it is recommended to: provide schools advance computer laboratories equipped with diverse technological based aids and with technical support, include new competencies in the curricula and in assessment schemes, implement new forms of continuous professional development to empower the

teachers for teaching with new skills and for promoting of a culture of lifelong and peer learning, building up a clear political will and invest in ICT consolidation, more ICT tools should be provided to each educational institution, motivateteachers through rewardsfor using ICTs in classrooms, integrating the ICT strategy into the institution's overall strategies, and transformation of positive attitudes towards ICT into efficient widespread practice.

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