

## A STUDY OF EMERGING TECHNOLOGIES AND THEIR IMPACT ON TEACHING-LEARNING PROCESS

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*ABSTRACT*-The objective of this research paper is to study the emerging technologies and measure their impact on teaching and learning. For this purpose, a questionnaire was developed to collect primary data from randomly selected teachers. The questionnaire was developed on the basis of 5-points Likert scale. The results of our student show that information technology has brought substantial impact on education sector in Pakistan and it has not only enhanced teachers' communication skill, teaching methods and guiding the students how to use this technology. We strongly recommend that maximum information technology may be used in teaching in order to enhance skills of teachers and knowledge of students.

**Keywords:** Information technologies, teaching process, learning process, computers, knowledge; advancements.

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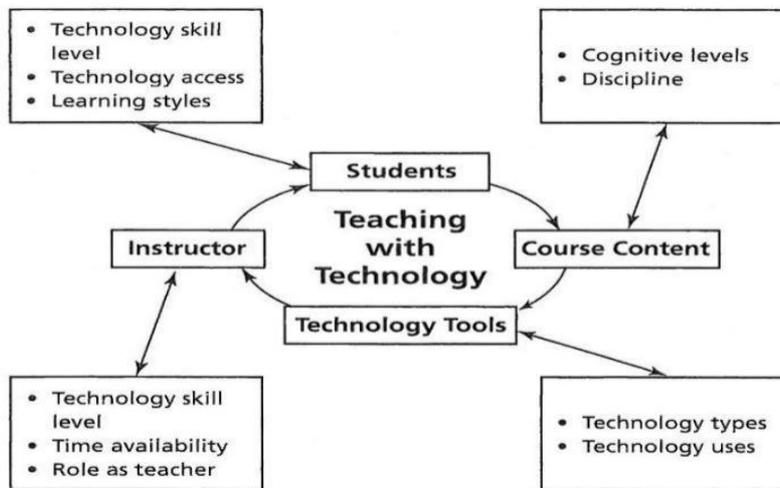
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## **1. INTRODUCTION:**

### **1.1. Background of study:**

Generally, the profession of teaching considered respectable and decent. It seems, by all accounts, to be a way of moving information starting with one age then onto the next in the class rooms. Hussain (2008) characterized it as a plan to change the psyches of new students to adopt new things that they really don't have a clue. There is a contrast between the developing minds and new learning brains which is not a simple errand of moving information. We talk about the strategy for training which has been utilized to advance information. It really comprises of various systems and sorts of educating. An instructional exercise model really encourages the understudies to get cooperate through their capacities to learn in a progressively energetic manner. Along these lines, they can get encourage to enhance their learning and intellectual capacities. It can be just imaginable by comprehension with the assistance of research and intelligent practice (Bronak, Sanders, Cheney, Riedl, Tashner, & Matzen, 2008) The usage of new and creating instructional advancements regarding teaching has truly helped the new academic settings and superseded classroom practices by such kind of 'digital education' environments (Hussain, 2005). The records which are given in coaching are a front-line instructional model intervened in information advancement. It really makes the students had pragmatic involvement with their field of learning with the help of their understanding, talents, skills, tempers, and aptitudes in such sort of studying environment (Dede, 1996). Figure 1 shows the use of technology in teaching process.

Figure 1: Teaching with Technology



## 2. LITERATURE REVIEW:

Bernhard (2012) expresses said that "all science in its generation of information is innovatively encapsulated and [scientific] recognition is co-determined by innovation, however, innovation, on the other hand, uses the theories of science" (p. 1984). One can't genuinely encounter science without encountering its technological measurement. Therefore, eminent technologies have progressively molded students' encounters with science just as impacted their associations with the regular/physical world. Among the technologies most regularly implanted in the school educational program to help to the teaching and learning of science are electronic tests (sensors and programming), dynamic demonstrating devices, intelligent representation devices, and coordinated e-learning situations (Krajcik and Mun, 2014). Their rising status or originality (Gershon, 2017) stems not just from their novel material structure (apparently new plan or look) yet in addition from their empowering of novel ways for teachers and students to facilitate educational

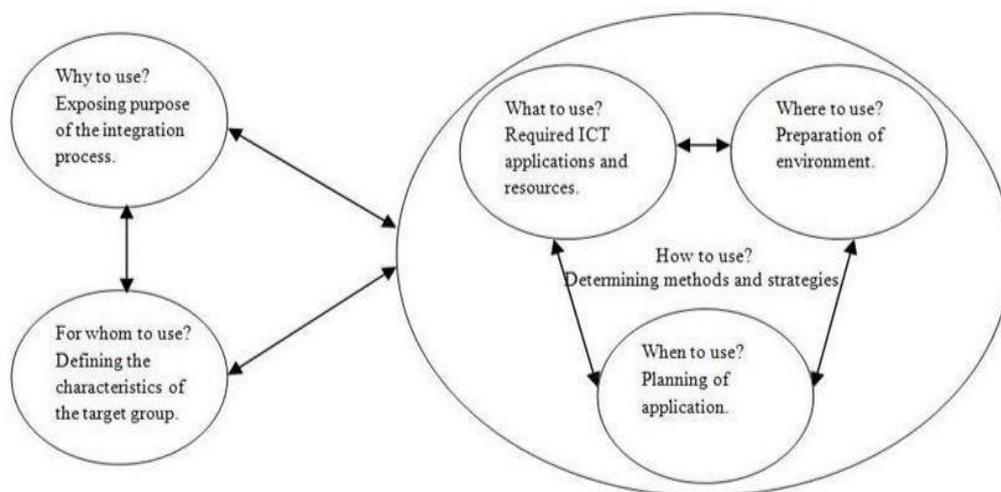
movement, social association, and information development (i.e., new communicative and epistemic affordances).

Data and correspondences advancements (from this point forward alluded to as "innovation") have developed enormously over the previous decade (Chmiliar and Cheung, 2007), and the desires for instructors have additionally developed exponentially. Messinger-Willman and Marino (2010) contend that "Instructors must encourage a learning domain that persuades the students to arrive at elevated levels of scholarly accomplishment while guaranteeing that curricular materials are available" (p. 5). In her editorial on the instructor's job in the class rooms, Gorlewski (2008) remarks that "our job is to culturally assimilate learners with the goal that they can be effective in the public arena. School accomplishment is planned to reflect both present and potential accomplishment outside of school" (p. 27). These remarks are intelligent of a move that has and is happening inside numerous training conditions far and wide, and it is being perceived at the national and global levels by instructors, managers, and policymakers. The model and participatory way to deal with making understudies ready to find out about their learning through communications and reflections. The improvement of innovation started by method for the computerized unrest through innovation developments has initiated a change. The PC has brought changes and it has altered the realities and records managing the web and the few systems which are working inside it (Asangansi, Adejoro, Farri, and Makinde, 2008).

Akbulut (2010) says that the contemporary regulatory focus which is really rehearsing just to make an inclination among the people. So, they can possibly utilize data correspondence innovation (ICT) to the extent their exhibition and self-conviction are concerned. Along these lines, ICTs have

been viewed as a significant piece of information and anticipate teachers to the extent their arrangement of the coaches is concerned. The process of teaching and learning with ICT integration has shown in Figure 2.

Figure 2: Integration of ICT in teaching and learning process



## 2.1 Emerging Technologies:

It will be helpful to start by explaining how science instructors consider innovation. A significant part of the science education literature on emerging technologies is strongly influenced by national educational policies. Especially powerful are the Next Generation Science Standards (NGSS), which characterizes the term innovation "comprehensively as a wide range of human-made frameworks and procedures... that outcome when designers apply their comprehension of the common world and of human conduct to fulfil human needs" (NRC, 2012, pp. 11–12). In addition, NGSS thinks about the rise of new advances as far as a relationship of association among Science, Engineering, and Technology, a Centre thought that teachers must handle because of their tutoring encounters (the NGSS Lead States, 2013)

## **2.2. Use of Technology in Pakistan:**

The innovation will bring a great deal of effect technological preparing just to give assistance to the instructors in their occupations. It is evident from our parametric results that wages, better preparing use and enrolment in better training contribute decidedly to the GDP. As we find that if there is a solid training framework, it will acquire a change in the monetary advancement of Pakistan. So, this territory must be advanced. It needs uncommon consideration just too important endeavor for the fast and appropriate specialized advancement of Pakistan. In view of this, the portion of the uses on advanced education as a rate with respect to as the expansion in the GDP is concerned. The unique rules should be planned with an end goal to feature the arrangement of better tutoring enrolment rates. The interest in the higher tutoring locale is especially vital because while taking near the cutting-edge innovation as interest for difficult work

In such a manner, the innovation may likewise find a way to help the framework in a superior manner. As indicated by Mariam, and Cafarella, (1997, p.15) "the new innovation (programming program) has broadened the methodology and attitude to the extent the scholarly capacity is concerned." Consequently, data advancements may likewise incorporate PCs and their related advances in the new time. Chapp, (1994) called them rising innovation and said that these are the new range that really leaving the lab and it gets spread under the control of new ages like educators and understudies.

### **2.3 Emerging technologies in Education:**

The developing technology as indicated by Bozalek (2011) is the technology which it has created an incredible effect on the calling of teaching. It can likewise put an effect on the information which can be put a ton of good impact on it. The utilization of the web, online journals and other material which are especially accessible can be valuable for the educating reason. Especially such kind of innovation is viewed as particularly valuable since it cost a lot low when contrasted with different callings. It can be easy to use.

As indicated by Van 'T Hooft (2009) that innovation can extend the learning procedure all over. It can make a great deal of new open doors for the understudies. Sloan (2006) talked that developing advances can set another framework for the educators and understudies so it will enable the students to like instructors and understudies to learn in a fitting manner through the innovation.

Bozalek (2013) says that rising advancements in instructing can be helpful to manage issues of imbalance and social avoidance. The most recent patterns in advanced advances, specifically utilizing web gear which incorporates websites, wikis and web-based life, and cell phones together with telephones, have given them the choice to upgrade their abilities. It causes them to share their insight. The virtual innovation engages present-day educators so as to find strategies to utilize this media to development inspiration through various exercises.

According to Hoque, Razak, and Zohora (2012) the utilization of rising technologies in teaching viewed as particularly high to build the reason for instructive changes of each progressed and developing the country. For thinking about universal areas, innovation can be useful in an approach to

assist in these kinds of issues. However, it is viewed as the best help to the extent that the innovation for encouraging activity is concerned. There is a lot of research which really depends on the elements affecting the utilization of innovation to the extent the training practice is concerned. It utilizes innovation in academic methodology inside the tutoring framework. The instructors use the programming system to make exercise plans, PowerPoint introductions and utilize keen gatherings for intuitive preparing. On the other hand, technology is much better source to make the system effective and efficient. According to Marian and Cafarella, (1997 p.15)” the new technology enhances the mental and intellectual capability of the concerning individuals. Although, the information technology includes the computer and its modern form of new era. Charp, (1994) says that it is the new era of technology with new variety, which is going through different processes and hence it is widely spread through the hands of new generation of teachers and students.

According to Bazalek (2011) stated that technology has a great impact on teaching methods. It imposes a positive impact with great impression towards it, the productive use of internet, blogs and such other material which are in fact very important for the teaching purpose. Also, it is very cost effective as compared to other fields. Its use and access is also very easy.

According to Van.T Hooft (2009) enhanced technology expanded very speedily. Through it, students avail a lot of opportunities. Sloan (2006) suggests that new technology establishes a new system for both students as well as teachers.it is really very helpful in education system.

Bozalek (2011) says that emerging technology discontinue the process of discrimination. Through it people are strongly socially connected. Most popular trends in digital technology, particularly as an internet equipment

such as blogs, wikis cell phones is considered as a better option to polish the skills. Although, it is a better option of sharing a knowledge. The virtual technology enhances the empowerment of today's mentors. Through different activities it introduces the different methods.

Hoque,Razak,and Zohora(2011) stated that Technology is very helpful in teaching practices. A lot of research has been done on the factors that influences technology, and also its impact on the teaching practices.in the school system technology plays a role of tutor for students. Mentors uses different types of software's to prepare lectures, presentations, as well as taking online training sessions on it.

#### **2.4 Various learning strategies**

Both the learner and the teacher have active participation in the learning process. In this method they don't teach but they can learn through dialogue between the learners and application of concepts and techniques. Through this activity they will learn and develop. Also, learners and teachers can achieve wide learning resources using this technology; increase their desire to learn, and various forms of learning. Collaborative learning, project-based learning, and self-based learning are some examples that can be facilitated by using this method (Rahmani et al, 2006).

#### **2.5 The Role of Teachers in Technology-based Training:**

Since the technology-based training is learner-centered education rather than relying on the teacher, there has been fundamental changes in the roles and responsibilities of teacher and the learning process. Learners can facilitate their learning process with the help of technology and educated without time and place constraints; in such an atmosphere they can easily collect and analyze data, testing hypotheses, designing experiments and

making conclusions. Because utilizing the tools and technologies will reduce some limitations in the classroom (Zamani & Azimi, 2008). In order to develop good relation between the teachers and students. The teacher must be good in his skills and approach. His method should be comprehensive. He must know all the basics as far as the emerging technology regarding teaching process is concerned.

### **2.6.Facilitation for learning process:**

The main task of a teacher is to enable the students in the learning matter and facilitate this process. So, with providing clear objectives, one should be prepared and compile the appropriate content, and try to encourage the learner to have active participation in learning matter and group discussions (Berge, 1995). Our mean of active learning is that in teaching, instead of a simple speech teacher should act in a way that the learner could understand his learning and be responsible for his learning and engaged him in teaching.

### **2.8 Enhancing Motivation:**

If the teacher can create a positive attitude in learning during the teaching process; it will motivate his students in learning. Also, it can help in creating an appropriate emotional and spiritual kind of element in classes. Due to this it will strengthen the inherent motivation in learners. This matter will improve in face to face situations and in dealing with learners. It will also help the teacher himself to make his ability and procedure better for the future.

### **2.8 Using Information Technology by students:**

Understands the vibrant media and make a proper thinking about it. Search the different ways of learning and strategies. Polish and enhance their skills and apply it as practically. Enhance their learning process and, create cooperation and team building. Create a self-learning ability at their own place

and save their time. Take it as a teacher and learn with it, rather than by the teacher. Resolve their queries and improve learning habits. Use the right data at right time at right place. Make a deep investigation on qualitative analysis. Sharing of their experiences with their teachers and other students throughout the world. It helps the students in their learning process, as well as teachers in their profession.

### **2.9. Use of Information Technology by Teachers:**

Improves their presentation skills in an attractive manner.

Guide their students to search a qualitative material in a best possible way.

Guide their students individually.

Suggests their students work in the direction of cooperation and joined learning mindset. Make their teaching methods more effective and try to bring innovation in it.

Overcome the different problems of students and help them.

Resolve the problems of students in their studies.

### **2.10 Methodological Considerations:**

Methods for knowing the impact of technology on teaching process is very important. The study deals with central idea is around funded philosophy. It is for the study already done or as to oppose it, or maybe it is a modern practice. In the different studies little assessment is shown and the formal authors support it. Most of the researchers like case-study approach, hence the proof of the different researchers is almost different.

It is understood, the reason that complicates shifting context makes it very hard to highlight the phrases altogether with lot of effectiveness towards it. So, without knowing the actual problem, it is very difficult to choose a

method to resolve it. How, we can do it in a particular manner.(Oliver & Harvey,2002).The extended process of evaluation in concerns of teaching methods is very difficult to be implemented as a new technology to the old ones.

Charge et-al (2005) contended that different tactics should be adopted as an alternatives of a unique elements of the specific area. Along with the forms of research procedures these issues remain constant with each and every steps of research methods. So, according to it one can easily distinguish between the real and fake elements. On the other hand, it also provides variety in data, as well as different evidences and their impacts. These variations might be helpful to bring the change through the use of enhanced techniques, according to the concerned research. Their classifications is based on the epistemological standards.to gain the attention, on the research make a difference between the work. The data which is trying to discussed is the importance of the conceptual work. Here we try to elaborate the issues of readers as well as researchers regarding their academics. Procedure of asking questions from different people and, then make an observation.

### **3. RESEARCH METHODOLOGY:**

This research was conducted to study the impact of emerging technologies on teaching and learning process. As a research tool, questionnaire was developed for the teachers. Likert scale was used for analyzing the data. It is shown the following options in the scale:-

$$S.A=5,A=4,N=3,D.A=2,S.D.A=1$$

The formula used was as under:-

$$\text{Mean} = \frac{(5 \times x_1) + (4 \times x_2) + (3 \times x_3) + (2 \times x_4) + (1 \times x_5)}{X_T}$$

Where X1, X2, X3, X4 and X5 are the responses while, XT is the total number of responses. Frequency and percentage of respondents was also determined.

#### **4.DATA ANALYSIS:**

##### **4.1 Analysis of teacher's statements:**

The analysis of teachers' statements are given in the following tables: -

Table 1: Computer as a teaching tool

Statement	Options	F	P	Mean
Computer is as an instruction tool	SA	5	50%	3.9
	A	2	20%	
	D	1	10%	
	SD	1	10%	

The data in table 1 shows that 50% teachers were strongly agreed, 20% teachers were agreed, 10% teachers were undecided, 10% teachers were disagreed while 10% teachers were strongly disagreed with the above statement. Mean score of the statement is 3.9.

Table 2: Education technology facilitate learning.

Statement	Options	F	P	Mean
Educational technology (hardware and software) Education technology Facilitate Teachers	SA	6	60%	44
	A	1	10%	
	UD	1	10%	
	D	1	10%	
	SD	1	10%	

The data in table 2 shows that 60% teacher were strongly agreed, 10% teachers were agreed, 10% teachers were undecided, 10% teachers were disagreed while 10% teachers were strongly disagreed with this statement.

Table 3: Technology helps teachers to transfer their ideas

Statement	Level	F	P	Mean
Technology provides opportunity to the teacher to Communicate their ideas.	SA	4	40%	3.7
	A	2	20%	
	UD	2	20%	
	SD	1	10%	

The data in table 3 show that 40% teachers were strongly agree and 20% were agree that technology help them to communicate their ideas to the students, while 20% were neutral whereas only 10% were disagree with this statement. Mean score was 3.7.

Table 4: Excessive time spending on computer

Statement	Level	F	P	Mean
Students spend too much time on computer Excessive time spending on computer	SA	3	30%	
	A	3	30%	
	D	2	20%	
	SD	1	10%	

The data in table 4 shows that 30% teacher were strongly agreed, 30 % teachers were agreed that excessive time was spent on computer while, 10% teachers were undecided, whereas 20% teachers were disagreed while 10% teachers were strongly disagreed with this statement. Mean score of the statement is 3.7.

Table 5: Computer reduces pressure on teacher

Statement	Level	F	P	Mean
Computer reduces the pressure on teacher	SA	5	50%	3.8
	A	1	10%	
	UD	2	20%	
	D	1	10%	
	SD	1	10%	

The data in Table 5 shows that 50% teacher were strongly agreed, 10% teachers were agreed that computer reduces pressure on teachers while 20% teachers were undecided whereas 10% teachers were disagreed and 10% teachers were strongly disagreed with this statement. Mean score of the statement is 3.8, so the hypothesis is accepted.

Table 6 Computer enhances professional development

Statement	Options	F	P	Mean
It enhances teacher's professional development.	SA	3	30%	3.5
	A	2	20%	
	UD	3	30%	
	D	1	10%	
	SD	1	10%	3.5

The data in table 6 shows that 30% teacher were strongly agreed, 20% teachers were agreed that computer has enhanced their professional skill while 30% teachers were undecided 10% teachers were disagreed and 10% teachers each were strongly disagreed with this statement. Mean score of the statement is 3.5.

Table 7: Learning through Technology

Statement	Options	F	P	Mean
Learning through Technology enhance learning skill personal learning style.	SA	2	20%	2.8
	A	1	10%	
	UD	3	30%	
	SD	3	30%	

The data in table 7 shows that 20% teacher were strongly agreed, 10% teachers were agreed that they learned through computer technology while 30% teachers were undecided, whereas 10% teachers were disagreed and

30% teachers were strongly disagreed with this statement. Mean score of the statement is 2.8.

Table 8: Role of motivation in involving students in learning activities

Statement	Level	F	P	Mean
Role of motivation in promotion of learning activities.	SA	1	10%	2.2
	A	1	10%	
	UD	1	10%	
	SD	4	40%	

The data in the table 8 shows that 10% teacher were strongly agreed, 10% teachers were agreed that role of motivation is effective to accelerate students' learning activities while 10% teachers were undecided whereas 30% teachers were disagreed and 40% teachers were strongly disagreed with this statement. Mean score of the statement is 2.2.

Table 9: Use of technology requires extra time

Statement	Options	F	P	Mean
Use of technology requires extra times and energy.	SA	1	10%	2.8
	A	1	10%	
Use of technology requires extra time to plan	UD	4	40%	
	D	3	30%	
Use of technology requires extra time to plan	SD	1	10%	2.8

The data in table 9 shows that 10% teacher were strongly agreed, 10% teachers were agreed that use of technology needed extra time while 40% teachers were undecided whereas 30% teachers were disagreed and 10% were strongly disagreed with this statement. Mean score of the statement is 2.8.

Table 10: Time consuming in software skills training

Statement	Level	F	P	Mean
software-skills training requires sufficient time.	SA	6	60%	3.3
	A	2	20%	
	D	1	10%	
	SD	0	0%	

The results in table 10 shows that 60% teacher were strongly agreed, 20% teachers were agreed that sufficient time is consumed in software learning while 10% teachers were undecided whereas 10% teachers were disagreed. Mean score of the statement is 3.3.

Table 11 Increasing academic achievement.

Statement	Level	F	P	Mean
Increases academic achievement (e.g. grades).	SA	3	30%	3.5
	A	2	20%	
	UD D	3 1	30% 10%	
	SD	1	10%	

The data in table 11 shows that 30% teacher were strongly agreed and 20% teachers were agreed that technology use has increased academic

achievements while 30% teachers were undecided whereas 10% teachers were disagreed 10% were strongly disagreed with this statement. Mean score of the statement is 3.5.

Table 12 Collaboration among students

Statement	Options	F	P	Mean
Promotes collaboration among students.	SA	3	30%	3.0 3.0 3.00
	A	1	10%	
	UD	1	10%	
	D	3	30%	
	SD	2	20%	

The data in table 12 shows that 30% teacher were strongly agreed and 10% were agreed that collaboration among students enhance their learning whereas 10% teachers were undecided whereas 30% teachers were disagreed and 20% were strongly disagreed with this statement. Mean score of the statement is 3.0.

Table 13: Developing communication skills

Statement	Level	F	P	Mean
Promotes the development of communication, skills	SA	4	40%	3.7 3.7 3.7
	A	2	20%	
	UD	2	20%	
	D	1	10%	
	UD	2	20%	

	SD	1	10%

The data in table 13 shows that 40% teacher were strongly agreed and 20% teachers were agreed that computer technology has developed communication skills whereas 20% teachers were undecided whereas 10% teachers were disagreed and 10% teachers were strongly disagreed with this statement. Mean score of the statement is 3.7.

Table 14: Improving concepts understanding among students

Statement	Level	F	P	Mean
Technology improves concepts among students.	SA	3	30%	
	UD	1	10%	
	D	2	20%	3.2
	SD	2	20%	

The data in table 14 shows that 30% teacher were strongly agreed and 20% were agreed that concepts of students were cleared due to computer technology while 10% teachers were found undecided whereas 20% teachers were disagreed and 20% were strongly disagreed with this statement. Mean score of the statement is 3.2.

## **5. CONCLUSIONS:**

From the above results, we have come to the conclusions that information technology has substantially improved the performance of the students and enhanced their learning skill and acquiring knowledge through internet. Information technology has also enabled the students how to use

different software for different purposes and it make easy particularly cumbersome calculation and drawing numerical results in which econometric, statistics are normally used. It has also saved time of the students which in past they spent in searching relevant material for research to complete their research work and relevant material for their examinations. This is the reason that educational institutions in Pakistan are widely using information technology not only for teaching but also for management efficiency and accumulation of data for decision making and future planning. Thus, it is advisable that the use of information technology must be expanded and teachers should be trained in the use of latest software.

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## CONTRIBUTION OF AUTHORS AND CONFLICT OF INTEREST

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This research work was carried out in collaboration between two authors.

**Author 1: Hussain Ahmad** has completed his M.Phil Education from the Department of Education, Institute of Southern Punjab. He designed the study, collected and analyzed data. He wrote first draft of the manuscript under the supervision of author 2. He can be reached at his Email ID: qazihussainahmad100@gmail.com.

**Author 2: Prof. Dr. Abdul Ghafoor Awan** did his first Ph.Ds in Economics from Islamia University of Bahawalpur-Pakistan and second in Business Administration from University of Sunderland, U.K. He contributed in this research paper by way of guiding author first about title selection, data analysis and statistical techniques. He also edited and gave final shape to the manuscript. In order to know about his other fields of research please look at his Web of Science Researcher ID  [M-9196 2015 or his profile at Google scholar.](#)

Both authors read the manuscript carefully and declared no conflict of interest with any person or institution.

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