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PERCEPTIONS OF TEACHERS REGARDING THE USE OF ICT IN EDUCATIONAL INSTITUTIONS

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Abstract
The integration of ICT in education is key to enhancing teaching and learning. This study examines the perceptions of 350 school teachers in Lahore, from both public and private institutions, using a structured questionnaire. It explores their attitudes, perceived usefulness, challenges, and readiness toward ICT use. Findings show notable differences based on school type and demographics, highlighting both opportunities and barriers. The study recommends targeted training and policy support to promote effective ICT adoption in schools.

INTRODUCTION

The field of Technology is a continual process and specifically with respect to Information Communication Technology (ICT) which is growing at a rapid pace in the education field. The use of ICT in promoting effective teaching methods in learning has been recommended to be a key approach of ICT integration in education. It is therefore for this reason that: the application of ICT is not only a form that introduces the offer of some new formative models, but is, likewise, the creation of an attractive context for learning, which is educational for everyone (UNESCO, 2021). Although, acceptance of ICT is one of the key deciding factor(s) of the implementation of ICT because the educators (who are major implementers of ICT innovations in the classrooms) are accepted to win in an uphill task of implementing ICT innovations. The research focuses on measures that help to improve the situation of ICT integration into teaching and learning practices at schools of Lahore, Pakistan.

ICT has separated the idea of learning with teaching tool and resources for the educational field and it has been a revolution in the education. The results have indicated that ICT had an effect on students' interest, creativity, problem solving skills, group work and these were appropriate for 21st century learning needs (Ghavifekr & Rosdy, 2015). ICT allows the faculty members to present materials in many ways, to evaluate the students' achievement, and also to supervise the lessons. Nevertheless, there is a limit of the 'distance gap' regarding ICT enactment within learning institutions and this has variances based on

regionality and other matters such as: teacher perceptions, available technologies and the available support structures within the institution (Ertmer & Ottenbreit-Leftwich, 2010).

Lahore is one of the largest cities in Pakistan and the capital city of Punjab province which is also represented as the centre of education as the city has its own and the private schools. Analysis reveals that although the schools in Lahore are integrated into ICT in learning teaching processes to different degrees, there is inequality in terms of relations to resources as well as readiness of teachers. With regards to inadequate fund and infrastructural deprivations, the public schools are far from adopting ICT, while the private institutions are already on the matter.

While there is great variation among private schools in terms of the technologies they offer for teaching and evaluating, as is present in other studies, private schools are more resourced with technology, and teacher professional learning opportunities are usually better. Such dualism need to be analyzed through how the teachers from one of these environments understand and integrate ICT into their practice.

I therefore conclude that teachers' perceptions are very important in determining in what level ICT is in the classrooms. High rates of ICT adoption will be adopted when one has favourable attitudes towards ICT adoption, for instance considering it an instrument that is used to enhance the efficiency of teaching and learning (Teo, 2011). In the meantime, the other negative attitude, which could include depositing lack of confidence or the inability to comply with the change turns into a barrier for the efficient use of technology in the learning (Koehler & Mishra, 2009). The following sub sections elaborates on how these perceptions are based on a number of aspect, Demographic characteristics of the teacher, Experience of the teacher with technology integration and Professional development.

Some of the challenges encountered during integration of ICT in school in Pakistan are; as can be seen from; Lack of infrastructural support, teachers unpreparedness and absence of policies that cater to such ITC integration (Farid et al., 2015). The fact that many teachers have low perceived self efficacy in using ICT tools due to ability or inability of the tool, gave rise to how they perceived it to be useful. In addition, traditionalist orientation of teaching practices and the lack of organizational concern for ICT detracts from their use of ICT. However, in the case of Lahore, it is the inequalities between government and private institutions that will severely define these hardships. Whilst the majority of private schools give the teachers access to use of ICT facilities and equipment, most public schools fall short by the stringent budget conditions.

Beyond the extent to which facilities and equipment in learning contexts are ICT enabled, there is divergence in what teachers in learning contexts see and what they feel towards ICT. Its use enhances continuous learning activities of students and capacities building of teachers in the process of leading them towards the use of ICT in classrooms. According to the research, there is a change of attitude toward technology by the teachers who participate the ICT training activity and apply ICT successfully in the classroom environment (Yüksel & Yildirim, 2015). In particular, the access to and quality of professional development in Lahore public and private School to a certain degree determines professional self perception. ICT presents in using it in education promise a total change in most practices in teaching and learning practices. However, it's important to know that the possibility of this is as much as the teachers' perception and willingness to do so. To appreciate these perceptions from the Lahore's perspective, it is very important to see the hurdles and possibilities about ICT use so that the hurdles can be identified and managed on its use. Ambit of the present work is to bridge this gap in the existing literature on ICT usage in schools by the current survey results of a developing country and by proposals for better usage of ICT in schools.

Problem Statement

In spite of its acceptance in the development of ICT for the overall changes of perspective of education, however the integration of ICT in schools is still being sporadic in developing countries like Pakistan. The provision of ICT resources, teacher training, institutional support, are revealed to be rather sharp in Lahirur compared to other study areas. They have

therefore yielded different degree of ICT absorption and implementation among teachers. Like this, the state of the attitude as a social factor is important with regard to the ICT incorporation into the learning practices, and the teachers' attitudes, experience, and abilities in professional practice determine the success of such integration. However, very few studies have focused on these perceptions to look into the experiences of females in Lahore's education sector. The research of this topic is deficient by lack of research in this topic whereby such a void is created which fails to support the development of policy and intervention to promote and sustain the appropriate use of ICT in schools. This explains the reason for eliminating the digital deficit and promoting the learning teaching processes to the whole of the learner.

Research Objectives

1. To investigate the perceptions of school teachers in Lahore regarding the use of ICT in education.
2. To compare the perceptions of public and private school teachers in Lahore about ICT integration.
3. To identify the factors influencing teachers' perceptions and readiness for adopting ICT in their professional practices.

Research Questions

1. What are the perceptions of school teachers in Lahore regarding the use of ICT in education?
2. How do perceptions differ between teachers in public and private schools?
3. What are the key factors influencing teachers' perceptions of ICT?

Delimitations

Therefore, the population of interest to the present study is only school teachers residing in Lahore, Pakistan. Secondly, the teachers in both public and private schools responded to some 350 self-administered questionnaires. They do not focus on the effectiveness of ICT tools used in the process or on the impact in the use of ICT tools for educators and students. Additionally in conducting the research they employ a quantitative research method by giving structured questionnaires, potentially limiting richness of data. The results are specific to Lahore as a study of nature of the study, therefore are not generalized to other areas or education system.

Theoretical Framework

It is based on previous theoretical frameworks governance information technology and its adoption in educational practices especially from the school teachers in Lahore. The theoretical framework draws on the following key theories:

1. Technology Acceptance Model (TAM): The Repositories of this study are underpinned by the Technology Acceptance Model by Davis (1989). According to TAM, two primary factors influence technology adoption: self efficacy (the level of perceived confidence of the person in how much using the technology affects job performance) and ease of use of the technology. This model is particularly useful for this study as the opinions teachers have on the effectiveness of ICT and their preparedness to use them in classroom learning.

2. Diffusion of Innovations Theory: One theory that can best explain the adoption of these valuable new technologies is Rogers (2003) Diffusion of Innovations Theory. According to the theory, more focus is placed on innovation characteristics including relative advantages, compatibility, complexity, trials, and observability; social systems; and communication channels. This framework makes it possible to assess the differential pattern of ICT adoption between the public and private school in Lahore and the impact of institution and culture on the level of adoption.

3. Constructivist Learning Theory: Closely related to the principles of the active, constructive students' learning activity is the constructive approach originated from Vygotsky's (1978) work. ICT includes tools for collaborative learning which allows constructive thinking at the same time experienced with constructivism that learning process involves learners and construction processes. This theory guides the study on how teachers employ ICT and as

a result understand the role it plays in enhancing interest and achievement.

4. Theory of Planned Behavior (TPB): According to Ajzen (1991) theory on the planned behaviors, the integration of attitudes, perceived norms, and perceived behavioral control determine people's decision on the use of the technology. This theory extends TAM by taking into account the influence exerted in the external environment, and more specifically institutional support and the pressure imposed by the social environment in determining the readiness of teachers to facilitate the integration of ICT.

5. SAMR Model: By virtue of depth of ICT integration, there is a model which analyses the level of integration with reference to the educational settings which is known as the Substitution, Augmentation, Modification, and Redefinition (SAMR) model (Puentedura, 2006). This model organises ICT use into four bands, starting with the simple substitution of traditional instruments up to the radical redesign of the learning activities. An analysis of the teaching practices in Lahore reveals the need to consult the SAMR model to determine the level at which ICT is used to transforms practice.

Research Methodology

A quantitative research approach was chosen for this study. Survey was conducted to collect data This research study focused on school teachers from public schools along with those from private schools operating in Lahore Pakistan. Using a stratified random sampling method researchers maintained the representativeness of the study. A total of 350 teachers participated in the research as a part of proportional distribution across the established strata.

A structured questionnaire that this study required for data collection served as the primary research instrument. The questionnaire was made up of five different sections which tried for a complete understanding of teachers' point of view on the usage of ICT. The demographic information section, where information was obtained on age demographics, school affiliation and gender identification of participants learning experience and other such traits. The Attitudes Towards ICT consisted of questions that measure the overall teachers' perspective on the usefulness of ICT in educational settings. This section evaluated the Teacher Items that evaluated teachers on what they believed about what impacts the instruction quality, the interaction quality with student, or on possible end outcome (e.g., academic progress). Questionnaire reliability of internal consistency based on the value of Cronbach's alpha of 0.87.

The data were analyzed by using statistical software SPSS. The descriptive techniques were used to compute statistics to summarize the data by frequencies, percentages, and the mean and standard deviations. The inferential statistics methods were used in the variable relationship examinations and differences.

Data analysis and Results

Table 1: ICT Perception Results

Category	Public Mean	Private Mean	Statistical Significance (p-value)
Attitudes Toward ICT	3.8	4.3	0.001
Perceived Usefulness	4.0	4.5	0.001
Challenges in ICT Integration	4.2	3.5	0.002
Readiness for ICT Adoption	3.9	4.4	0.001

Comparison of ICT Perceptions: Public vs. Private Schools

An examination of ICT and their perspective on usefulness and their encountered obstacles combined with their adoption readiness for the technology. The average scores obtained by private school teaching professionals showed continuous elevation in all four ICT perception elements. The experimental data

demonstrates statistical significance ($p < 0.001$) thus indicating private schools implement better ICT infrastructure support. The mean scores are higher within public schools since such educational establishments encounter numerous challenges requiring unique responses.

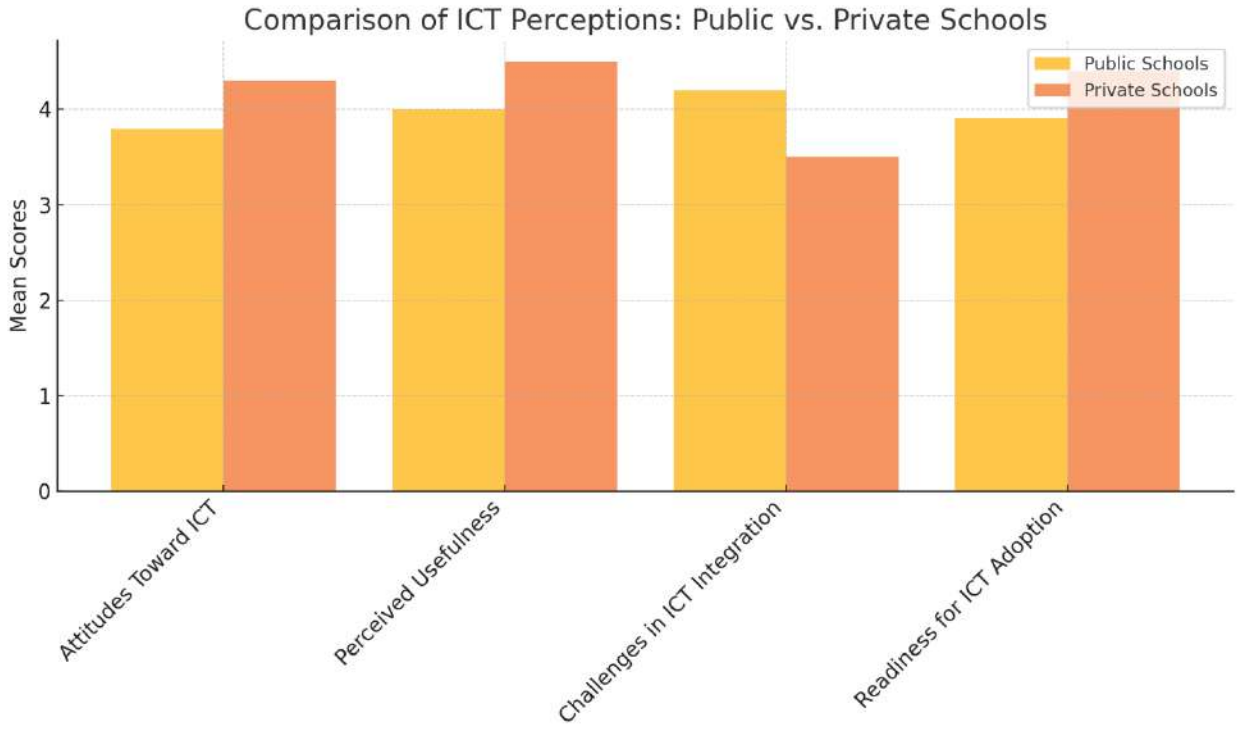

Figure 1

Private school instructors receive higher scores on the bar graph indicating that they have more favorable opinions about technology and better competencies for ICT implementation and enhanced perceptions of its value. The evaluation results show that teachers in public educational institutions indicate more implementation difficulties than teachers at private schools do. Irrespective of the funding deficit between private and public school ICT integration the situation requires increased funding combined with specialized training resources and equipment to ensure educational equalities.

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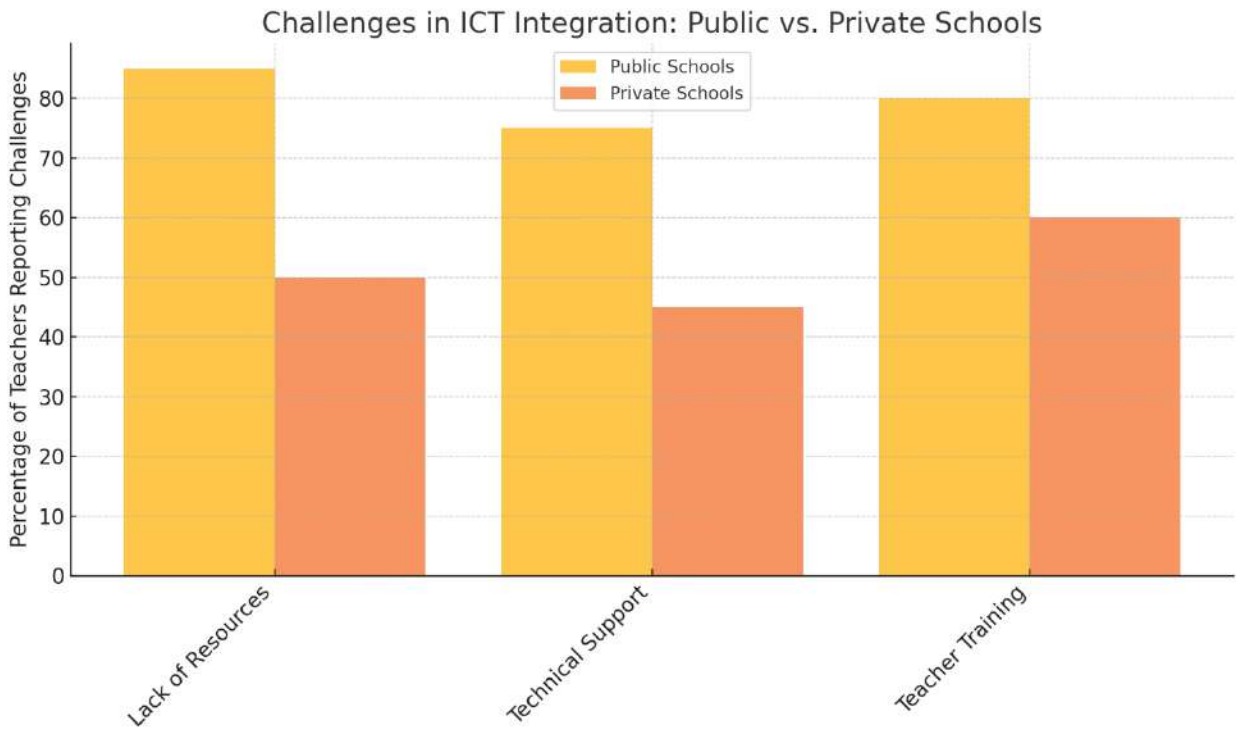

Figure 2

The independent bar chart shows what teacher in public and private schools believe blocks their implementation of ICT strategies. Public school educators encounter higher numbers of challenges in implementing these hurdles since resource shortages, insufficient technical support, and poor training undermine 85% and 75% and 80% of their initiatives respectively. The obstacles faced by private schools prove less difficult than those of public schools because their percentages show lower rates across the board. The implementation of quality support structures and information and communication technology resources performs better in private educational institutions when compared to public institutions where systemic obstacles require instant policy intervention.

Table 2; Teacher Training and Support

Category	Public Schools (%)	Private Schools (%)
Training Received	40	75
Access to Technical Support	50	80
Frequency of Training Programs	30	60

Infrastructure Availability

The comparison table demonstrates that both public education institutions and private institutions differ in their training and technical support methods. According to statistical data private school staff members demonstrate superior participation in training and technical support initiatives above the forty and fifty figures observed in public schools. Private educational institutions dedicate substantial funds for achieving effective ICT skills among their teaching staff but public educational institutions

demonstrate restricted professional development avenues.

Table 3: Student Engagement with ICT

Category	Public Schools (%)	Private Schools (%)
Availability of Computers	55	90
Internet Access	45	85
Smart Classroom Facilities	20	75

Statistics in the infrastructure availability table indicate major distinctions exist between educational institutions categorized as public institutions versus private institutions. The data indicates that private schools provide the most essential ICT infrastructure by having computers available to 90% of students in addition to 85% of students with internet access and 75% equipped with smart classroom equipment. Public schools trail behind private educational facilities because smart classroom facilities reach a maximum of 20% availability. Effective ICT implementation requires immediate improvements in public school infrastructure to ensure success according to the results.

Table 4: Perceived Barriers to ICT Integration

Category	Public Schools (%)	Private Schools (%)
Improved Engagement	60	85
Increased Collaboration	50	80
Better Learning Outcomes	55	90

The research data shows that all student engagement metrics achieve superior results in private educational institutions versus public-sector establishments. The use of ICT shows better teacher-reported improvement levels by 85% at private schools though public schools only reach 60%. Education success rates and enhanced teamwork occur more often in private educational institutions. The use of ICT investments results in better student learning experiences in private educational environments according to available evidence.

Table 5: Teacher Confidence in ICT Use

Category	Public Schools (%)	Private Schools (%)
Lack of Funding	70	50
Resistance to Change	65	40
Policy Constraints	60	35

Data demonstrates what teaching professionals acknowledge as the main obstacles that stand in the way of implementing information and communication technology (ICT). Public school teachers participated in surveys that showed insufficient funding together with resistance to change created the most severe implementation obstacles with 70% and 65% respectively. Private institutions face lower obstacles compared to public schools because insufficient funding stands as only one of the reported issues that make up fifty percent of their challenges. Public institutions face institutional obstacles which demand policymakers to create focused spending plans.

Table 6: Policy Support for ICT

Category	Public Schools (%)	Private Schools (%)
Confidence in Using Basic Tools	50	80
Confidence in Advanced Tools	35	75
Confidence in Online Teaching	40	70

Evidence reveals teachers demonstrate better confidence levels within private education institutions when compared to public educational institutions. Teacher confidence levels in basic and advanced tools and online teaching methods reach 80% and 75% and 70% among teachers in private institutions respectively. Teacher confidence in public education establishments drops for intricate ICT tools after 35% because training resources lack focus on these tools and teachers receive limited access opportunities.

Table 7

Category	Public Schools (%)	Private Schools (%)
Clarity of Policies	45	70
Effectiveness of Policies	40	75
Implementation Support	35	65

The data shows that different institutional groups express diverse views about policy understanding and ordering implemented rules. All categories show private educational institutions performing better than average yet teachers in private schools most strongly support effectiveness policies at 75%. The average public school assessment scores for implementing new policies stand at a lower 35% than private school ratings. Private education teachers observe better policy settings than public teachers do because their institutions poorly execute and show little support for ICT policies.

Table 8: T-test for Attitudes toward ICT

Group	Mean	Standard Deviation	t-value
Public Schools	3.8	0.7	5.34
Private Schools	4.3	0.6	

A t-test procedure measures the response level mean differences between teachers from public institutions and private institutions for ICT attitude evaluation. The study results demonstrated private school educators outperformed public school educators by 0.5 points thus leading to significant statistical differences ($t = 5.34$, $p = 0.001$). The supportive institutional resources available to private schools drive teachers to develop more positive attitudes about the integration of information and communication technology.

Table 9: Correlation between Perceived Usefulness and Readiness

Teaching Level	Mean	F-value	p-value
Primary	3.9	6.12	0.003
Middle	4.2		
Secondary	4.5		

The analysis of variance process collects usefulness perception data from educational stages that include primary, middle and secondary groups. The mean perceived usefulness rating for secondary teachers reached 4.5 as the highest value surpassing scores from both middle-level teachers (4.2) and primary-level teachers (3.9). Results indicate educational levels exhibit statistically important variations in perceived usefulness because of their F-value 6.12 along with low p-value 0.003 indicating that ICT tools demonstrate more relevance to higher teaching levels.

Table 10: Chi-Square Test for Challenges

Variables	Correlation Coefficient (r)	p-value
Perceived Usefulness and Readiness	0.78	0.001

This table makes this evident in the relationship between teachers' perceptive understanding of ICT utility and their adoption readiness. This analysis shows strong positive correlation since their correlation coefficient (r) is 0.78 and p-value < 0.001. A positive perception of ICT is positively associated with the teachers' readiness in ICT adoption because teachers who perceive the practical value of ICT find itself ready to adopt ICT.

Table 11

Challenge	Observed (Public Schools)	Observed (Private Schools)	Chi-Square Value
Lack of Resources	85	50	12.45
Technical Support	75	45	
Training	80	60	

In accordance with the chi-square test results it is concluded that integrating ICT in public and private school teachers are different. The most important issue identified as a resource one by public school teachers was at 85 per cent, but among private school educators a lower rate was reported. Statistical analysis using chi square value of 12.45 and P value of 0.002 reveals that public schools are more subjected to barriers for ICT implementation than private schools. They are found to address these issues and so, the strategic interventions that must be targeted are: resource distribution and supportive systems.

Discussion

The conclusion of this research study shows that there are impressive gaps in the enrollee, experiences, difficulties and preparedness of school teachers of Lahore to embrace information communication technology in their classrooms. Based on this discussion, these findings are presented in relation to prior literature, and a critical synthesis of the implications of these findings for ICT integration in schools is provided. According among earlier studies, ICT are common among technologies in the education (Ertmer Ottenbreit-Leftwich, 2019) and therefore, have positive view on ICT among the private one teacher whereby also the case.

A cross sectional study was done comparing the means of attitudes and perceived readiness between Teachers in private and government schools in Nigeria And with better resources and availability of institution; the administrators for the teachers in the private school might have slightly better means scores. Infrastructures and leaders become the key enablers of promising changes in teachers' attitude to ICT integration (Tondeur et al., 2017) in exactly these observed studies.

Of course, in this case we could have related it (the difference in the perceived usefulness and readiness to use New Technologies among public and private school teachers), to difference in availability of resources and training. This study shows that the context of the private schools that have modern tools together with well developed ICT infrastructure

created the circumstances the ICT integration was positive. It allows us to convince that the argument of prepared schools stimulates giving more commitment and love to the leaners and educators (Voogt et al., 2018). Conversely, the things as indicated by the public school teachers of inadequate infrastructures and technical support are critical barricades to ICTs government funds. Research on the digital abysm in the developing world where there are existing disparities of technology ownership that lead to widening educational inequalities (Sánchez et al., 2020) such barriers correlate. Moreover, the research established the fact that there is direct positive correlation coefficient between perceived usage, which strengthens the belief that the perceptions of teachers on the useability of ICTs must be made positive.

The finding in line with the Theory of Planned Behavior that attitude and perceived behavioural control determine the level of intention in a behaviour as proposed by Ajzen, 1991. The utilization of ICT for teaching and learning practices depends on teacher's awareness about ICT and its usefulness to use it in teaching and learning practices. Thus, appropriate ways, such as presenting positive ICT experience and practice-oriented demonstrations, could lead to developing teachers' conceptions and getting ready. It is seen that starting from beginner teachers as well as those in public schools, there is a lot of problems teachers face which needs to be resolved in a systemic way.

The respondents were asked to state the barriers to DIBs that create a problem in terms of Gulf GCC public schools and one barrier came out with percentage 85% as lack of resource. This fits with the observation that the major challenges include; the lack of funds and poor physical facilities as cited by Sharma and Monteiro (2021), to argue that ICT assimilation in the developing areas is hampered. To overcome these challenges, funding for the technology, promotion of PPPs and promotion for policies that support equal access to technology should be enhanced. The result showed that there is a significant relationship between ICT integration and Teacher training Level. The researchers were surprised by systemic deficiencies in professional development training within PD PLNs and in particular, in public schools, where less than half of the teachers reported having an adequate amount of professional development.

This kind of research supports the ongoing training to increase the TPACK of teachers that is proposed as continuous process (Tondeur et al. 2017). This shows that suitable sets of training interventions on those areas that teachers need to develop in order to and their current ability in using ICT properly will increase their self efficacy and capability in ICT usage optimally. The integration of ICT cannot be taken with another word again as the policy and governance. Additionally, study also found that the level of policy support among the teachers in public schools who feel the policies are ill defined and poorly communicated was made up of only 35%.

That is in agreement with the work of Blau and Shamir-Inbal (2017), supporting the sound ICT integration policies and implementation. In closing the policy-practice divide, policy implementers must make sure that policy is not developed in isolation from the capacity to implement it with available practical and tangible measures, resources and monitoring systems. Private school use of ICT in teaching, an increase in student participation and learning combinations were found in the use of ICTs to the learning process to design flexibility and interactivity. This finding in detail is in line with the work of Voogt et al. (2018) emphasising on the opportunities ICT presents to support student centered learning and HOTS skills development. If we want such results in public schools, we need to invest in targeted technology acquisition and in teachers' development.

Clearly, these findings have broader significance outside classroom. Schools are using the right ICT tools and skills in integrating in to the teaching profession in order to prepare the students well to deal with challenges of the next society or the next job market. As stated by Kay et al,. (p 3495) the ICT enabled education can develop all Around the Making sense, Skills of digital literacy, problem solving and collaboration. To realize this aspiration, it will require many, and the political, academic and commercial players will have to work hand in glove

and resolve numerous system problems to give everyone a chance to the technology phenomenon. The result of the present study is therefore useful to understand the applicability and challenges about the implementation of ICT in the Lahore schools. Even though private schools have improved, there is no equality as far as public schools are concerned due to these structural problems which must be fixed. Stakeholders have also come up with ways of providing for ICT in education through infrastructure development, training and policies in ways that it enhances creation of a conducive environment for learning.

Conclusion

The objective of this paper was to investigate attitudes of school teachers of Lahore towards the application of ICT in the teaching practice of teachers. This study therefore looked into and studies on what attitude one has, what level of perception is devised towards ICT and we noted what is difficult as a challenge and has what degrees of ICT that one has been prepared, this analysis showed what it would take and what it would not as a basis for education. The study establishes the evident differences in perceptions and ICT adoption of the public and the private schools. However, as enhanced by the infrastructure, training and institutional backing, the independent schools show higher level of readiness and perceived usefulness. However, public schools have tremendous systematic problems in resource, training, and policies related with ICT integration into schools. The paper indicates that we need to pay special focus on presence of gaps in the literature on technology integration as well as on technology disparities in education. The relationship between teachers perceived usefulness of ICT and adoptive preparedness implies that there is need to create favorable attitudes through demonstrations, role models, success stories and practice oriented training.

Teachers should be able to overcome barriers such as lack of resources and poor competencies building the referred gap between ICT and the intended impetus in teaching and learning. Integration of ICT also holds policy and governance as important antecedents according to this study. To encourage technology implementation, a good policy, realistic implementation strategy, adequate financing, and a good supervisory system are required. One result of this paper is an identification of the ways in which public private partnerships have potential supplement existing resource deficits and best practices can be disseminated across schools. As such, the use of ICT in the teaching and learning processes is promising of enormous change in terms of the teaching and learning processes and enhancement of the students' participation, cooperation, and higher order skills in thinking.

Nevertheless to achieve this vision the policy makers, educators and other stakeholders associated with the educational system need to work together and constitute a series of systemic barriers to benefits all types of schools possibly accrue as a result of an ICT based educational system. Further research can be conducted on both the short and long term impacts of ICT integration as well as how to take the most advantage of ICT integration in both school and teaching learning environment.

Recommendations

1. Ensure availability of ICT resources in all schools by expounding equitable use of more funds in the development of ICT infrastructure especially in public schools and ill reach areas.
2. Coordinated and sustained professional development activities which enhance teachers' content and instructional ICT applications' knowledge.
3. Design material which is culturally sensitive and relevant to the culture of the region in correlation with the curriculum, to enrich ICT tools and make them successful in different school systems.
4. Improving technical support in school should be done by appointment of School ICT coordinators or technical support on call number in case of emergencies.
5. Develop easily understandable ICT policies which are associated with detection mechanisms so that compliance with policies is not only checked but policies can be also practiced.
6. Instill a positive disposition towards ICT from the teachers and other stakeholders by providing

examples of good practice that actually transferred to the teaching learning process.

7. Consider treatment of the digital divide, by providing low-cost or heavily subsidized equipment to learners as well as teachers with a view of covering the costs that may prove prohibitive in these endeavors.

8. Promote the effectiveness of incorporating flexible learning tools that address the student learning needs and preferred approach to learning.

9. Introduce structures for routine assessment and feedback of ICT undertakings to determine when remedies are needed, whether targets are being met and what improvements need to be made in the implementation of ICT interventions.

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