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Bridging the Digital Divide: Unveiling the Usage Level of Digital Educational Tools among Teachers and Students of Target Region (A Case Study of Gilgit- Baltistan, Pakistan)

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ABSTRACT

The purpose of this assessment is to identify gaps in access and availability of digital tools, as well as to evaluate their effectiveness in improving learning outcomes. A total of 300 students and 100 teachers were randomly selected from different government, private, and NGO higher secondary schools in GB. A questionnaire was created using the LIKERT scale and given to both teachers and students. Afterward, a statistical analysis was conducted. An effort was made to determine the variations in teachers' gender using the T-test, and to analyze the differences in school types for students using one-way ANOVA. Revealing the average mean usage of digital educational tools by both teachers and students is (3.163272, 3.163272). The analysis indicates that both teachers and students have moderate usage level of digital educational tools. Additionally, both teachers and students lack advanced-level skills in using digital tools for teaching and learning, furthermore The usage level of educational digital tools in private schools is moderate, while in government schools it is low, and in NGO-based schools, it is again at a moderate level skills in learning. The usage level of digital educational tools in schools has significant implications for academic outcomes, teacher quality, and resource allocation. Integrating digital tools effectively can improve learning outcomes, increase accessibility, and personalize instruction.

INTRODUCTION

The technological innovation has been very rapid during the last few decades. The 19th century was characterized by the Industrial Revolution, which intensified the human productive power, the 20th century introduced the machine and the birth of computer technology transformed the patterns of human life. Now, information is in access of a common man due to computer and internet technologies. ICT refers to the technological tools and resources that are used to manage, store, process or share information. It has revolutionized the whole world and the education sector has not been unaffected by its influence. ICT has gifted it with unique and modern tools, which has in turn, upgraded the whole education sector. Educational institutions must move along with these technology driven changes in order to equip their learners with modern tools to survive in an "information saturated environment". It has the ability to improve education quality, expand learning opportunities and make education accessible. As the success of an individual has become dependent upon his digital educational tools skills, we can say that the progress of a whole nation has become directly proportional to the usage level of digital educational tools.

Canevez (2021) believes that, in a very short time, ICT has become one of the basic building blocks of modern society. Now, many countries regard the ICT understanding and utilization as a part of their core education.

This research would attempt to highlight the usage level educational digital tools by teachers and students in their learning process. This research is important as this is going to be the first research about the usage level of educational tools in higher Secondary Schools of Gilgit Baltistan in order to improve the integration of ICT tools in learning process. This research is unique in that it provides statistics on the basis of subject and gender. This research would be helpful for the future researchers of this field.

Although most of the schools claim to have provided the students with educational digital tools, yet it is unknown how much resource and facilities are utilized in schools and how much do they assist the school management to provide their students with ICT based learning. Hence, it is important to analyze the utilization level of ICTs among teachers and students to facilitate innovation in education. This study may help the people of Gilgit Baltistan by opening a way towards the ICT based teaching which would in turn be a move towards a new era of technology. A gap always exists between the rural and urban societies. Gilgit Baltistan is still, a remote area where the adoption and utilization of ICT is not yet common. Many researches have already been done to explore the utilization of ICT in different places but none of them is applicable to be implemented in Gilgit Baltistan.

Research Questions

What are the teachers and students' usage levels of educational digital tools in their classroom?

Are there any variances in teachers' level of educational digital tools usage on different school type basis?

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Are there any variances in students' level of educational digital tools on the basis of subjects and school type?

LITERATURE REVIEW

Due to globalization, the need of ICT has intensified. 21st century is the era of information and the use of ICT has become a must, to adapt with the environment. All the human endeavors have been reformed. As the world has shrunk, the flow of information has become easy due to which the education sector has revolutionized. Al-Abdullah and Hassan (2023) states that, "the 21st century jobs will require information processing skills." So, the significance of ICT utilization can't be denied. This is because ICT can help students to develop their skills, boost up their motivation and widen their knowledge and information (Lo, 2024).

Haddad (2002) throws light upon the effectiveness of ICT in education. According to him, ICT escalates the learner motivation by simplifying the attainment of fundamental skills and by improving teacher training. Saud (2023) also asserts that the "use of ICTs in Education yields far better results as compared to conventional methods of teaching-learning." So, the reliability of ICT and its far reaching effects are beyond doubt.

To improve the standard of education, interaction should be ensured between the teacher and the student. ICT acts as a bridge to connect the various components of education sector hence, providing better chances of learning. According to Pozas and Letzel (2023), ICT provides better opportunities for the academic and non-academic staff to communicate with one another more efficiently to enhance the learning process. Ibrahim *et al.* (2018) also agree with Haddad and give reference to (Rana & Rana, 2020) in their research to state that the utilization of ICT in education improves "the quality of teaching and learning, the research productivity of teachers and students, and the management and effectiveness of institutions".

In developing countries, the utilization of ICTs is not satisfactory as they have to face various challenges. As they don't have access to the modern gadgets, they don't have enough utilization of ICT tools due to which their chances of development get even lower. So, a better utilization of ICT must be ensured to cope with the modern challenges. The teachers should be well trained to handle the use of ICTs. To improve the quality of education and "the management and effectiveness of institutions," ICT usage in education needs to be ensured (Qaddumi *et al.*, 2021). Research conducted by The Ministry of Education in Malaysia says that the use of ICT in all institutions is necessary to increase income and, hence, the development of Malaysia. So, it can be said that the whole economy of a country is in direct relation with the use of ICT. The utilization of ICT needs to be extended further to promote the educational advancements to bring developments on huge levels. Lawrence and Tar (2018) conducted a research in Malaysia to find out the extent of utilization of ICT in the higher secondary schools. They recorded a lower use of graphical visualizing tools. A huge majority of the teachers agreed that the utilization of ICT would improve their learning environment. So, they suggested that, "school administrators should initiate industry-teachers partnerships to deliver ICT training programs that are appropriate to teachers' needs." Another research in (Dwiono *et al.*, 2018) found that "email was yet to be recognized as a tool for collaboration among students and teachers." So, the utilization of ICT also includes the online resources.

Lubis *et al.* (2018) suggests that the teacher educators should try to provide the pre service teachers with the chances to learn how to design "learning environments that integrate technology" to enhance the learning process. Likewise, Clifford believes that teacher education should focus the attention of teachers on the better utilization of digital technologies for learning, to improve the learning process and "to bring those technologies into classrooms in increasingly meaningful, effective, innovative and just ways". Teachers have to face challenges while using ICT as they are used to the conventional methods. The utilization of ICT can be successful only when the teachers are motivated to do so. Mailizar (2018) tried to measure the teacher' readiness for use of ICT in Benin, Mali and Ghana to find out how much the teachers are involved in the process of using and integrating ICT in education. Similar researches should be conducted in other regions to highlight the extent of need of ICT utilization. UNESCO (2002) stated that teacher education institutions are facing a challenge of training a new generation of teachers to use the new ICT tools effectively. (Alt, 2018)stressed upon the "need of trained ICT workforce". They have made a reference towards (Mahdum *et al.*, 2019), who has highlighted "a widening digital divide" among people. He believes that the economic and social position of people, their groups and the whole countries can be influenced by the level of effective utilization of ICTs. Norris in 2001 had perceived ICT literacy as a factor to divide the people between those who are "educated in informatics" and those who can't use ICT based tools.

Researches and strategies have been designed to improve the utilization of ICT to enhance the education and hence the other sectors like "human resources and training, policy environment, financing and ICT investment, curriculum development." Now, there is a need to implement these policies. Utilization of ICT requires the instructors to be a bit tactical to make effective use of it. Learning can be enhanced if teachers generate engaging activities for the learners, using ICT resources. Innovative use of these resources would help the students in acquiring the required skills.

MATERIALS AND METHODS

The research questionnaire explored the usage level of educational digital tools by asking questions regarding the use of "Microsoft word, power point, excel internet and using modern applications, service for Collaborative/

individual Learning" were used in this study. Total of 16 items of five sections were used, each section detail is given below. The value of Cronbach's Alpha was at least .6 therefore questioners were reliable.

Table 1: An overview of the questionnaire instrument's sections

Sections	Dimensions	No of items	Scale	Reliability values
Teachers	Usage level of educational tools/ packages	14	((NCA) = 1, somewhat confident (SWC) =2, Not sure (NS) =3, Confident(C) =4, Very confident (VC) =5	.803
Students	Usage level of educational tools/ packages	14	((NCA) = 1, somewhat confident (SWC) =2, Not sure (NS) =3, Confident(C) =4, Very confident (VC) =5	.835

A targeted region was Gilgit Baltistan Pakistan the targeted sample for this research was, the teachers and students in higher secondary schools in Gilgit Baltistan. We chose specific institutions with ICT facilities using purposive sampling. We randomly selected 20 students and 10 core subject teachers from the pre-selected institutions. Random stratified sampling techniques were used for the students, and cluster sampling techniques were used for the teacher. A questionnaire was designed for both students and teachers the data collection, exploration, and analysis were performed using SPPS 16.0.

RESULTS

Table 2: Usage level of educational digital packages/tools among students

Items	Mean	Standard Deviation	Level
Write text, text color	4.0918	1.05817	High
Cut, copy past, font size, font style	4.3469	0.94573	High
Insert table, insert page number etc	3.949	1.16242	High
Save ,save as, open, delete and locate existing files in a drive	4.3316	1.01639	High
Creating a new slide, text, picture, sound etc.	3.6633	1.31222	High
Insert digital photograph	3.4082	1.34612	Moderate
Slide animation etc.	3.5306	1.36027	High
Easily find web site by research	2.0153	1.25872	Low
Download any kind of material and software	2.9082	1.31724	Moderate
Search required resources for my assignments	1.9592	1.27234	Low
Send an email, attach documents in email	3.4388	1.38909	Moderate
Video tutorials	2.9031	1.52443	Moderate
Video conferencing app	2.6684	1.34249	Moderate
Educational games	2.8929	1.36767	Moderate
Simulators	2.2755	1.08869	Moderate
Blog chatting ,wikiis, Facebook, twitter	3.3112	1.39966	High
Listening audiovisual cassettes	2.4949	1.3756	Moderate
Open resources for learning	2.75	1.35259	Moderate
Mean of Mean/SD	3.16327	0.9876	Moderate

Mean scale: 4.5> high level 3.51-4.50=high 2.51-3.50=Moderate 1.51-2.50= low 1.00-1.50=very low

An analysis of the data collected regarding the educational digital tools usage level among students reveals that most of the learners are well acquainted with the fundamental uses of digital tools. However, it can also be extracted from the facts that the usage level of video tutoring, video conference app, educational games and simulator is moderate among them.

The basic tools, e.g: Write text, text color mean and standard deviation: (4.0918,1.05817), Cut, copy past, font size, font style mean (4.3469), standard deviation (0.94573) Save, save as, open, delete and locate existing files in any drive (3.949), standard deviation (1.16242), Creating a new slide, text, picture, sound, etc. Mean (4.3316), standard deviation (1.01639) Slide animation, etc. means (3.5306) and standard deviation (1.36027), which indicates high-level usage level while advancing tools e.g: send an email, attaching documents in email mean and standard deviation (3.4388, 1.38909), video

tutorials (2.9031, 1.52443), videoconferencing app (2.6684,1.34249), educational tools (2.892, 1.36767) and simulator, etc. (2.2755, 1.08869) which indicates advance tools have moderate level usage among students the overall result shows that the average mean of usage level is (3.163272) and the standard deviation is (0.9876).

Table 3: Usage level of educational technology packages/tools among teachers in teaching process

Educational technology Tools/Packages	Mean	Standard Deviation	Level
Write text, text color	4.3117	1.12694	High
Cut, copy past, font size, font style	4.5195	0.92637	High
Save ,save as, open, existing files in any drive	4.5974	0.86237	High
A new slide, text, picture, sound	4.1429	1.27439	High
Insert digital photograph	4.1039	1.32372	High
Slide animation etc.	4.1818	1.23253	High
Easily find the website by researching	4.4675	0.94011	High
Download any kind of material and software	4.5325	0.80434	High
Send an email, attached documents in email	4.5065	0.92656	High
Video tutorials	2.1299	1.28094	Low
Video conferencing app	1.8571	1.37376	Very low
Educational games	3.7403	1.39927	Moderate
Grading software	2.4675	0.91168	Low
Blog chatting ,wikiis, Facebook, twitter	4	1.29777	High
Listening audiovisual cassettes	2.2597	0.97876	Low
Open resources for learning	4.2597	1.10504	High

Mean scale: 4.5> high level 3.51-4.50=high 2.51-3.50=Moderate 1.51-2.50= low 1.00-1.50=very low

An analysis of the data collected regarding the digital educational tools usage level among teachers reveals that most of the learners are well acquainted with the fundamental uses of digital tools. However, it can also be extracted from the facts that the usage level of video tutoring, video conference app, educational games and simulator is moderate among them.

The basic tools e.g: Write text, text color mean and standard deviation: (4.3117,1.12694), Cut, copy past, font size, font style mean (4.5195), standard deviation (0.92637) Save, save as, open, delete and locate existing files in any drive (4.5974), standard deviation (0.86237), Creating a new slide, text, picture, sound, etc mean (4.1429), standard deviation (1.32372) Slide animation, etc. means (4.1818) and standard deviation (1.23253), which indicates high-level usage level while advancing tools e.g: send an email, attach documents in email mean and standard deviation (3.4388, 1.38909), video tutorials (2.9031, 1.52443), videoconferencing app (2.6684, 1.34249), educational tools (2.892, 1.36767) and simulator, etc (2.2755, 1.08869) which indicates advance tools have moderate level usage among teachers also, the overall result shows that the average mean of usage level is (3.163272) and the standard deviation is (0.9876).

Table 4: Usage level of digital educational packages/tools among students by school type

	Sector	N	Mean	Std. Deviation	Std. Error
Digital_tools_usage_mean	Private	125	3.2805	.93913	.12331
	Government	100	2.8453	.45508	.13721
	NGO based	75	3.6590	.35630	.12597
	Total	**300**	**3.2616**	**.87269**	**.09945**

Table 4 shows the main variances among usage levels of educational digital packages/tools. Here, we applied a one-way ANOVA test. The results were displayed against each school. We also attempted to find differences and similarities by using the compare-mean method. The average mean of private schools is 3.28051, which showed much higher results than the private and government sector results shown in the table. So, the NGO-based colleges seemed to be more advanced than the private and government sectors. The average mean of private schools is 3.28051 which indicates the usage level of educational digital tools has moderate usage level in their learning, while the average mean of government schools is 2.845333 which indicates the usage level is low and the average usage level of NGO-based schools is 3.6590 indicates again moderate level usage level in digital technology.

Table 5:

		Sum of Squares	df	Mean Square	F	Sig.
Digital tools_usage_level	Between Groups	7.662	5	1.532	2.167	.004
	Within Groups	50.219	71	.707		
	Total	**57.881**	**76**			

Significance of the test is also determined. If results are less than .05 values then we consider the test significant. The result p value = 0.004 (less than 0.05 and therefore significant).

Table 6: Usage level of digital educational packages/tools among teachers by gender

	Gender of teacher	N	Mean	Std. Deviation	Std. Error Mean
Digital_tools_mean	Male	43	3.1352	1.03725	.15818
	Female	34	2.4062	.58514	.10035

Tabe 6 shows the average mean value of both male and female the average mean value of male is 3.1352 which indicate the average level of digital educational usage level among male teachers, while the average mean of female is 2.4062 which indicate low level of digital educational tools usage among students during teaching and learning process.

Table 7: Average mean value of both male and female

		Levene's Test for Equality of Variances		T- test for equality mean				
		F	Sig	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
ICT_usage_mean	Equal variances assumed	4.280	.071	-1.235	75	.221	-.20254	.16402
	Equal variances not assumed			-1.237	74.956	.207	-.20254	.15199

A T-test is significant if the results show the values greater than .05. In our case the p-value is greater than p> .05 thus the test is significant.

CONCLUSION

ICT has become the trend of the 21st century. It spread like a bush on fire and left a special imprint on the education sector by introducing new tools and technologies, which has made its use indispensable. The education sector is trying to improve its utilization of ICT to ensure a better educational environment. The utilization of ICT in education is still in the early stages of its development in Gilgit Baltistan. Most of the teachers either lack the resources or are unable to find effective ways to use ICT inside the classrooms as they are deprived of proper training and skills. So, they are not confident about ICT use. The level of the educator's exposure to ICT resources is minimal. ICT utilization requires special attention to improve the region's educational development. In order to fit into the new technology-driven era, the schools of Gilgit Baltistan, as a matter of necessity, must develop a culture that places a high premium on ICT utilization.

Recommendations

The study reveals the extent of utilization of digital educational tools in the Higher Secondary schools of Gilgit Baltistan. The Higher Secondary Schools of Gilgit Baltistan can improve the educational outcomes by adopting the following recommendations about the utilization of digital educational tools in the region:

➢ Tutors should help the teachers in handling the ICT equipment's to enhance its utilization in the region to provide them with better opportunities of learning digital educational tools skills.

➢ The use of common digital educational devices should be ensured by the authorities. These devices include computers, projectors, tablets, tablets and other online devices.

➢ A professional certificate of digital educational tools skills should be made compulsory in the educational institutions to promote the utilization of digital educational tools in the region.

➢ Authorities should try to fulfill the digital educational tools requirements so that the users should not state financial crisis as a barrier in this regard.

➢ The curriculum should be designed in a way to ensure the maximum use of digital educational tools. Policy and planning.

➢ The government should try to make policies for the successful utilization of digital educational tools in the educational institutions.

➢ Online resources should also be recognized as important tools of ICT and the educational institutions should also be facilitated with the internet facility. Also,

the use of simulators, gaming software and online learning tools should be ensured.

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