

## TRANSFORMING EDUCATION IN REMOTE REGIONS: EVALUATION OF IMPLEMENTING ICT KNOWLEDGE IN HIGHER SECONDARY SCHOOLS OF GILGIT BALTISTAN

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### ABSTRACT

The main objective of this study is to evaluate the ICT knowledge of both teachers and students in the context of teaching and learning in higher secondary schools in Gilgit-Baltistan (GB). A total of 200 students and 100 teachers from various governments, private, and NGO higher secondary schools in Gilgit Baltistan were randomly selected for the study. A questionnaire was designed using the LIKERT scale and distributed to both teachers and students. The data was statistically analyzed, revealing that on average, 58.46% of teachers and 49.04% of students felt very confident about their ICT knowledge, while 20.59% of teachers and 27.46% of students felt confident. Additionally, 8.52% of teachers and 8.35% of students were not sure, 8.52% of teachers and 8.51% of students were somewhat confident, and 2.9% of teachers and 5.81% of students were not confident at all. The analysis indicated that the overall ICT knowledge was considerably high. However, the lowest level of ICT knowledge among teachers and students was observed in the teaching and learning process. Furthermore, a T-test was conducted to identify the variances in ICT knowledge between teachers and students. The study emphasizes the significance of ICT in teaching and learning, highlighting its role in enhancing the learning experience through the integration of digital tools, multimedia, and interactive content, which can effectively engage students.

**Keywords:** ICT, Teachers, students, knowledge of ICT, higher secondary schools.

### INTRODUCTION

With the growing demand of ICT, its implementation has become a significant issue. To promote the integration of ICT in the education sector, its implementation needs to be evaluated in order to bring educational reforms in the region of Gilgit Baltistan. Rossi, Lipsey & Freeman, (2004) stress upon the need of evaluation of ICT at classroom, school and national level for the improvement of teaching and learning of science. They believe that the poor implementation would lead to difficulties about the effectiveness of ICT. ICT has influenced every aspect of our life. Data collection, organization, interpretation and processing have become quite easy and every corner of the Earth has come nearer. Murray (2003), suggested that, "the 21st century jobs will require information processing skills." Therefore,

development of ICT is indispensable. As every field of life has become associated with ICT, its implementation needs to be ensured to bring improvements in every sector.

The statement of (Lawrence and Tar 2018)deserves attention in this regard. "ICT-Based Education has improved the motivation and success of students." So, the significance of implementation of ICT can't be denied. (Lázaro Cantabrana, Usart Rodríguez et al. 2019) also give huge importance to research in this field to improve teacher training and elaborate ICT literacy education. The research of (Alkamel and Chouthaiwale 2018) about the Malaysian science teachers show that ICT is common there but they came up with an innovative idea. They stressed upon the training of using ICT in "constructivist ways" to enhance the learning

process. It means that only the presence and access isn't necessary but the tactical use is also necessary otherwise it can have negative impacts too. Dependence on ICT can stop the process of cognitive improvement. Their recommendation that, "The computer should be seen as a tool for learning, rather than teaching machines" deserves appraisal. An evaluation of the implementation of ICT is obligatory according to all researchers because without evaluation, the implementation would end up in a disaster, as it is the only way to find the loopholes of the process of implementation to run the system successfully.

(Barroso-Osuna, Gutiérrez-Castillo et al. 2019) also conducted a similar research in Malaysia. Their findings also stressed upon the implementation of ICT. They also agreed that implementation of ICT is necessary to improve the standards of teaching. 85% of the teachers favoured the use of ICT to integrate more computer applications into their teaching. Majority of the teachers stated that they possess insufficient knowledge of ICT integration into teaching and proposed seminars and trainings for the proper implementation of ICT. This evaluation highlights the need of proper ICT integration and suggests new ways to enhance the implementation of ICT.

(Cabero-Almenara, Arancibia et al. 2019) showed similar concerns and stated that "school educational environment must provide enough opportunities to build up ICT literacy" (Gupta and Yadav 2022). Now, to keep a check and balance over the implementation of this ICT literacy, we need to maintain a proper system of evaluation. This evaluation of implementation of ICT would obviously ensure a better integration of ICT.

UNESCO(2004) defined ICT as , "the technology used to communicate, create, manage and distribute the information." The modern technologies also include the online resources which have created an environment of global learning. (Obe 2018) makes a reference to Noni in her research, who stated that, mastering the ICT means the ability to understand and use ICT in general, including the computer and understanding the information. She also states a previous research of (Haleem, Javaid et al. 2022), who tells that Indonesia has provided 116 cities with the facility of ICT, due to which the number of internet users has increased and speeded up. An increase in number of internet users hints towards

the overall progress of the country this evaluation of implementation of ICT done by (Perifanou, Economides et al. 2021) reveals the progress of ICT integration and also highlights the points to be worked upon. There is a dire need of such researches in other regions too.

(Pettersson 2018). explored the intention behind implementation of ICT in developing countries. They prepared a framework for the improvement of ICTs in rural areas. They stated that the reason behind the failure of most of the ICT for development projects is actually the lack of a framework. This framework can be helpful in evaluation of the implementation of ICT in certain regions. This framework included the perspectives of various organizations and funding bodies in this regard. A similar framework was prepared by (Retnawati, Djidu et al. 2018) provided the tools of assessment for the successful implementation of ICT pilot projects. He focused upon the monitoring and evaluation mechanisms of ICT pilot projects. Without proper evaluation, the ICT tools might cease to function properly. (Regmi and Jones 2020) discusses the factors of failure of ICT as, "inappropriate software, inappropriate hardware, and inappropriate design". He also states that the unsuitable frameworks prove to be more arduous than other methods. So, for a useful evaluation of ICT integration, we need to choose and implement a suitable framework to judge the usage of ICT, to spot the areas which require attention.

It is also being observed that in some countries of the world, ICT projects have been implemented but they didn't prove to be successful due to loopholes in policies and practices. It has been possible to reveal the escapes, just because of the evaluation strategies. Ashraf, M., Swatman, P. Hanisch, J. have highlighted a few of them. They believe that while implementing ICT, its impacts should also be realized. They also devised a framework to explore the impact of ICT on development at Micro level. This literature review portrays a general overview of the present situation of ICT implementation in some developing countries. (Joshi, Vinay et al. 2021), states that above all problems, the developing countries consider ICT as a "catalyst for change" as it would enable them to cope up with the challenges of 21<sup>st</sup> century. So, the implementation of ICT requires proper evaluation at all levels to keep an eye over the progress of ICT

and to monitor the developments in the education sector.

**1.1 Research Questions:**

1. How confident are students about ICT knowledge in effective learning?
2. How confident are teachers about ICT knowledge in effective teaching and learning?
3. Are there any differences in teachers and students ICT knowledge with regards gender?

**2. Research Methodology:**

Approach of this research is quantitative for finding the answers of the problem by exploring

literature as a secondary data and primary data from questionnaires of the respondents of this study. Data is collected through distribution of the questionnaires to the teachers and students of both district Hunza and Gilgit in three sectors (private, NGO and government). Population for the research was, teachers and students of Gilgit Baltistan. Stratified sampling technique for students and cluster sampling for teachers was used in this research. SPSS 16.0 was a tool used for data analysis and it can perform a variety of descriptive and exploratory data analysis.

Sample	Distributed Questionnaires	Returned Questionnaires	Returned Questionnaires %
Teacher	200	196	98%
students	100	77	77%

As evident from the table, a total of 300 questionnaires were distributed among the selected sample. The students were given a total of 200 questionnaires, out of which 196(98%) were returned. teachers were being given a total of hundred questionnaires, among which 77% were being filled and the remaining questionnaires did not receive any response. Approximately all of the teachers showed their response.

**2.1 Research Procedure:**

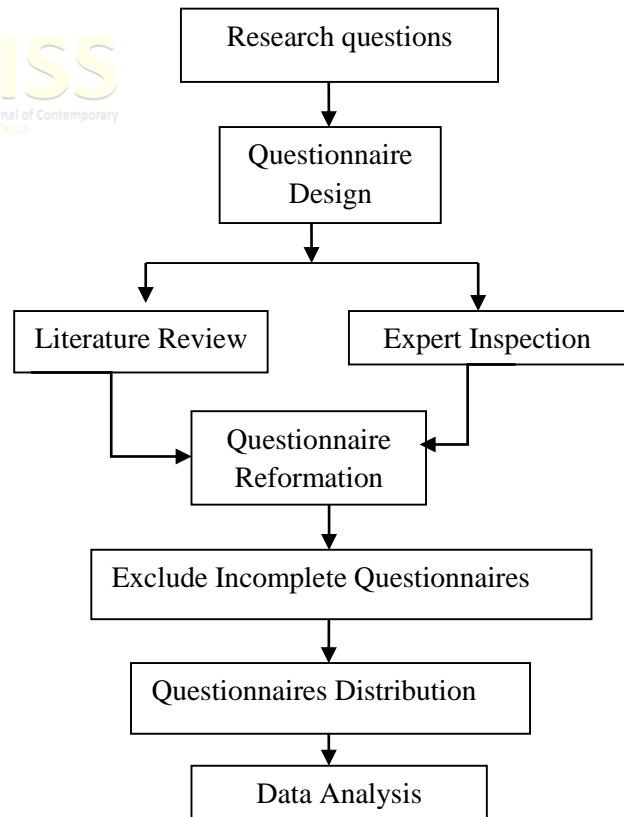


Figure 1 details the research procedure, from questionnaire development to distribution and analysis. Research questions and literature guide

questionnaire design. The finalized questionnaire is sent to the field, incomplete responses are excluded, and valid data is analyzed, contributing to the overall research implementation

**4. Results and Analysis:**

**Figure2: The number of participants on the basis of gender:**

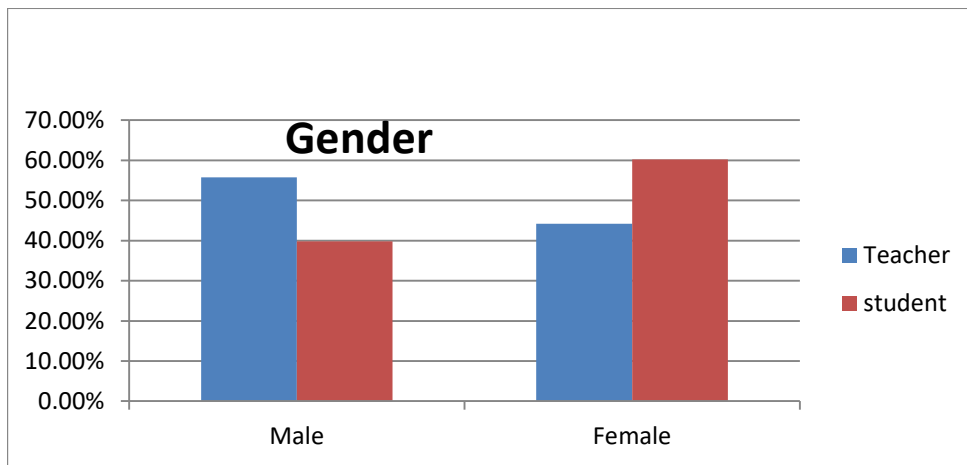


Figure 1 explains the number of participants based on gender. There were more male teachers (55.8%) than female teachers (44.2%) who participated in the survey. As for students, there were more female participants (60.2%) than male participants (39.8%)

**Table: 1 Analyzing ICT knowledge among students (N=196)**

Items	Mean	Standard Deviation	Mode	Percentage				
				Not confident at all 1	Somewhat confident 2	Not sure 3	Confident 4	Very confident 5
I can define the computer	4.2041	0.75731	4		5.6%	3.6%	55.6%	35.2%
I know all parts of computer	3.5306	1.15651	4	3.6%	20.4%	18.4%	34.7%	23%
I can switch on, restart and shut down the computer	4.6684	0.71412	5	1%	2.6%	0.5%	20.4%	75.5%
I can open a programme in computer	4.4796	0.84404	5	1%	4.6%	3.1%	28.1%	63.3%

I can open multiple programmes in computer	4.2245	1.06728	5	2.6%	8.2%	8.2%	26.5%	54.6%
I can create a folder and save my files in it	4.5051	0.82585	5	0.5%	4.6%	4.6%	24.5%	65.8%
I can define hardware and software	4.2959	0.98927	5	2%	6.1%	7.7%	28.6%	55.6%
Operating system in PC	3.3878	1.44742	5	15.8%	14.3%	15.8%	15.8%	30.6%
Application software	3.5663	1.47133	5	15.8%	10.2%	13.3%	23%	37.8%
<b>Cumulative</b>	<b>4.0958</b>	<b>1.03034</b>	<b>4.77</b>	<b>5.81%</b>	<b>8.51%</b>	<b>8.35%</b>	<b>27.46%</b>	<b>49.04%</b>

Above table (1) shows the level of awareness of ICT and basic knowledge of computer. Install and uninstall application knowledge was high, with an overall arithmetic mean of 4.0958 and standard deviation of 1.03034. So the standard deviation is relatively high, it indicates the higher deviation among the study samples. The results also showed a strong ICT knowledge in the students as most of them agreed with the statement, "I can switch on, restart and start down the computer" where the mean was 4.6684 and the standard deviation 0.71412. The mode was 4, which means the highest response rate that was "confident", with a percentage response rate of 75.5%. The statement,

"I can create a folder and save my files in folder" recorded second highest percentage of agreements, where the mean was 4.5051 with a standard deviation of 0.975. The lowest percentage was recorded in response to the questions about "Operating system in PC" e.g. operating system installation in PC, where the mean was 3.3878 with standard deviation of 1.44742, showing a greater deviation among student's responses at this level. The mode was 2, and the highest recorded response was "somewhat confident", with a percentage response rate of 30.6%, which indicates the lack of advanced knowledge regarding ICT.

**Figure1: Cumulative analysis of student ICT knowledge in learning**

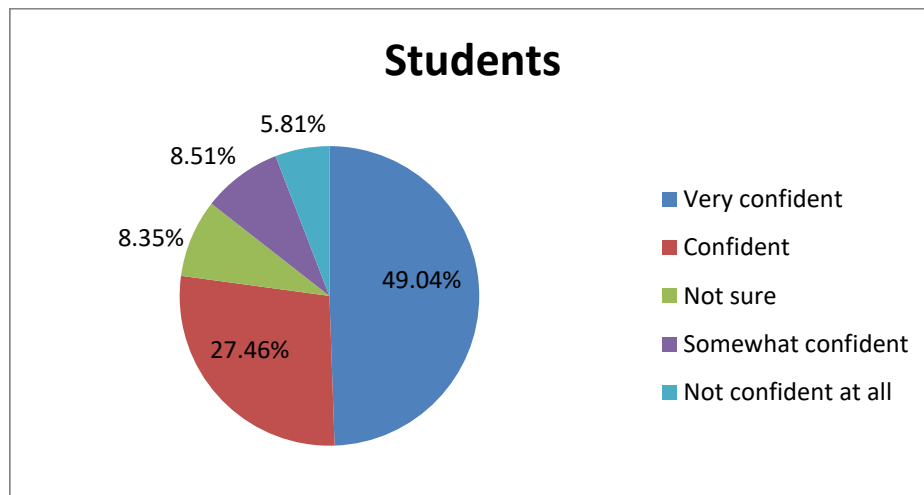


Figure 1 the analysis shows that most students (49.04%) are very confident and (27.46%) are confident in their ICT knowledge during the learning process. This indicates a high level of ICT knowledge among the majority of students. However, a small percentage of students (8.35%)

are unsure about their ICT knowledge. Additionally, minorities of students (5.81%) are not confident at all, and (8.51%) are somewhat confident, suggesting that they still lack sufficient ICT knowledge during the learning process.

**Table 2: Analyzing ICT knowledge among teachers (N=196)**

Items	Mean	Standard Deviation	Mode	Percentage				
				Not confident at all 1	Somewhat confident 2	Not sure 3	Confident 4	Very confident 5
I can define the computer	4.0779	1.06086	5	2.6%	9.1%	9.1%	36.4%	42.9%
I know all parts of computer	3.5195	1.23129	5	3.9%	22.1%	20.8%	24.7%	28.6%
I can switch on, restart and shut down the computer	4.7403	0.54778	5	1%	1.3%	1.3%	19.5%	77.9%
I can open a program in computer	4.6234	0.70783	5	1.5%	2.6%	5.2%	19.5%	72.7%
I can open multiple programmes in computer	4.4805	0.91206	5	2.6%	2.6%	5.2%	23.4%	66.2%
I can create a folder and save my files in folder	4.5974	0.83129	5	1.3%	2.6%	6.5	14.3	75.3
I can define hardware and software	4.4545	0.95346	5	1.5%	7.8%	9.1%	13%	70.1%
Operating system in PC	3.7922	1.31126	5	6.5%	15.6%	11.7%	24.7%	41.6%
Application software	3.961	1.24014	5	5.2%	13%	7.8%	28.6%	45.5%
<b>Total</b>	<b>4.2496</b>	<b>0.97738</b>	-	<b>2.9%</b>	<b>8.52%</b>	<b>8.52%</b>	<b>20.59%</b>	<b>58.46%</b>

Table 2 indicates that the knowledge of ICT and basic computer skills such as "installing and uninstalling applications" is high, with an overall arithmetic mean of 4.2496 and a standard deviation of 0.97738. The low standard deviation suggests

that there is little variation among the study sample. The results also show a good level of ICT awareness among the teachers, as indicated by their positive response to statements such as "I can switch on, restart and shut down the computer,"

which had a mean of 4.7403 and a standard deviation of 0.54778. The mode of 5 suggests that the highest response rate was "very confident," with a percentage response rate of 77.9%. Another statement, "I can open a computer program," received the second highest response, with a mean of 4.6234 and a standard deviation of 0.70783. Again, the mode was 5, indicating a high level of confidence among the teachers, with a percentage

response rate of 72.7%. However, the lowest level of agreement was found among the teachers regarding the statement "I know all parts of a computer," with a mean of 3.5195 and a standard deviation of 1.23129. The mode was 5, but the percentage response rate was lower at 28.6%, indicating less confidence in their knowledge of all parts of a computer

**Figure3: cumulative Analysis of ICT knowledge among teacher**

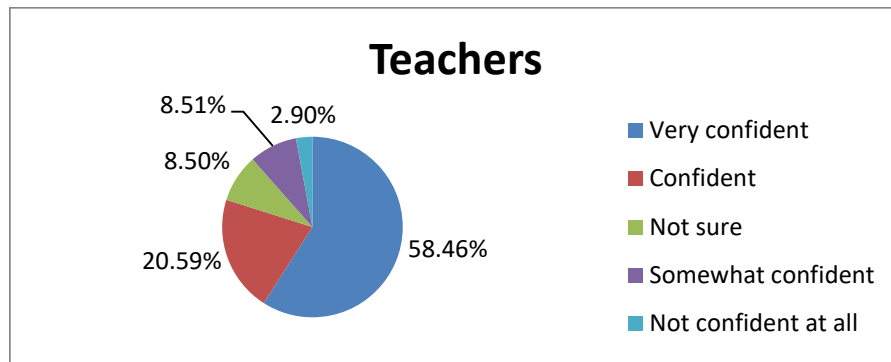


Figure 4 the analysis shows that most teachers (58.59%) are very confident and (20.59%) are confident in their ICT knowledge during the learning process. This indicates a high level of ICT knowledge among the majority of teachers. However, a small percentage of students (8.52%)

are unsure about their ICT knowledge. Additionally, minorities of students (2.90%) are not confident at all, and (8.52%) are somewhat confident, suggesting that they still lack sufficient ICT knowledge during the teaching and learning process.

**Table: 3 Mean scores of students ICT knowledge with regards gender**

Item	Gender	Mean	Std
<b>Basic Computer skills knowledge</b>			
I can define the computer	Male	3.2308	1.01831
	Female	3.0763	0.9073
I know all part of computer	Male	4.2179	0.71437
	Female	4.1949	0.78728
I can switch on, restart and start down the computer	Male	3.5897	1.14456
	Female	3.4915	1.16755
I can open a program in computer	Male	4.7179	0.66249
	Female	4.6356	0.74725
I can open multiple programme in computer	Male	4.5641	0.71332
	Female	4.4237	0.919
I can create a folder and save my files in folder	Male	4.4103	0.98608
	Female	4.1017	1.10469
<b>Software Installation and uninstallation knowledge</b>			
Operating in PC (Window)	Male	4.0256	1.26875

	Female	2.9661	1.40775
Application software, (MS office, games)	Male	4.359	1.01897
Anti-Virus	Female	3.0424	1.49297

Table 3 shows the overall results, with N number of cases for each instance of gender. The results show that there is no significant difference in the knowledge of ICT, between males and females. However, the ICT knowledge of software installation knowledge in PC e.g. “operating system in PC” and “application software, (MS

office, games) anti-virus was somehow lagging in females. About the statement, “I can open a program in computer”, the mean of male’s response was 4.7179 and the mean among females was 4.6356, so males showed a better positive response. It reveals that males possessed high ICT knowledge than females.

**Table: 4 Mean scores of teachers ICT knowledge with regards gender**

Item	Gender	Mean	Std
<b>Basic Computer skills knowledge</b>			
I can define the computer	Male	3.8605	1.24559
	Female	4.3529	0.69117
I know all parts of computer	Male	3.3721	1.25401
	Female	3.7059	1.19416
I can switch on, restart and shut down the computer	Male	4.6744	0.64442
	Female	4.8235	0.38695
I can open a program in computer	Male	4.5581	0.73363
	Female	4.7059	0.67552
I can open multiple programmes in computer	Male	4.3488	1.04389
	Female	4.6471	0.69117
I can create a folder and save my files in folder	Male	4.5581	0.88108
	Female	4.6471	0.77391
<b>Software Installation and uninstallation knowledge</b>			
Operating in PC (Window)	Male	3.7442	1.38173
	Female	3.8529	1.23417
Application software, (MS office, games)	Male	4	1.25357
	Female	3.9118	1.23993

Table 4 above shows the overall results, with N number of cases for each instance of teachers. The results show that there seems no specific variation among both the genders. But the Basic Computer skills knowledge in PC e.g. “I know all parts of computer” is lesser in males as compared to the females. In the response of the statement “I can switch on, restart and start down the computer”, the mean of females’ was 4.8235 and the mean of responses among the males was 4.6477. So, the female seemed to have better ICT knowledge than male.

**4.Recommendations:**

- A regular assessment of the use of ICT should be ensured in the institutions. A coordinator should be appointed for this purpose.
- A strategic plan should be prepared for the proper and timely evaluation of ICT implementation in schools.
- Sufficient financial resources should be ensured to fulfill the requirements of ICT implementation.
- Power supply and back up functions should be improved to keep the system running.
- Proper computer lab, projector and internet should be must in every school.



- ICT education for teachers should be must. Proper trainings should be arranged for their professional development by enhancing their ICT skills.
- Instructors of all the subjects should be facilitated with laptops and online resources to facilitate their access to the relevant content.

### **5. Conclusion:**

ICT has improved the competitive advantage of institutions therefore the evaluation of implementation of ICT has become a matter of consideration. Implementation without evaluation would soon lose its significance. This study evaluated the extent of implementation of ICT in the region and revealed that the ICT implementation in the education sector needs further improvement as the level of ICT integration is very low. People possess the basic knowledge of ICT, but they lack the necessary information about dealing with online resources and other advanced equipments. The recommendations hinted towards the need of allocation of funds to enhance the teacher training and improve the ICT tools.

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