

# Students' Perception on Impact of Utilization of Information Communication Technology (ICT) to Improve their Academic Performance: an Analytical Study

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**Abstract**— Information Communication Technology (ICT) is playing vital role in almost all the spheres of life and for the transparency and faster development of the nation. ICT is being utilized in the field of Teaching-Learning widely as one of the most important tool. Smart classroom based Teaching-Learning are now a days very common in the educational institutions which improves quality of education as well as quality of results. This paper explores utilization of ICT in the higher education and analyze the impact of utilization of ICT in learning process on students' perceptible. A questionnaire is developed for the purpose and data are collected from various higher educational institutions. Study is based on three different groups to see how these groups are different in terms of utilization of ICT in learning process. Three established hypothesis are based on Gender (Male and Female), Nature of institution (University and College) and Level of class (PG and UG). The hypothesis are tested using t-test and the results are found as per the expectation.

**Keywords**— Information Communication Technology (ICT), Significant Difference, t-test Introduction

## I. INTRODUCTION AND LITERATURE REVIEW

The word is growing with very fast rate and ICT is playing very important role in this development . The field of education is also affected with the utilization of ICT. Modern ICT is basically use of computers and computer related devices or equipments to present and communicate the information. The term, Information and Communication Technology (ICT), refers to forms of technology that are used to transmit, store, create, share or exchange information. ICT is interchangeably used with Information Technology (IT) and may combine other communication equipments like telecommunication ,Internet and others. It helps peoples to access educational classes regardless of geographical distance or obstacles [1].In the field of education also ICT is playing very important role for both students as well as for teachers, it has added new novelties and changed the meaning and methods of Teaching-Learning, students can use ICT for the learning process which gives them clear understanding about the topics with the help of audio and video while on the other hand teachers can use ICT as teaching add to enhance their

quality teaching with the help of internet ,both can access the digital contents available on the web. Many studies in this direction have carried out by the researchers to analyze the impact of ICT in Teaching-Learning. The study is done in their respective area and institutions. S. Bidarian and et al. [2] have studied about application of ICT in Teaching-Learning process and presented a model for this. The model is resulted from continuous study of obtained findings and benefiting of new technology of ICT.

Utilization of ICT in Teaching-Learning process may be affected by many factors ,teachers and students may not utilize ICT in Teaching-Learning process due to lack of knowledge and lack of motivation although they may be having sufficient ICT related infrastructure at their working place. In this context a study is done by authors [3] for payam noor university of mazandaran from teachers and students' point of view and presented various barriers like financial ,technical ,human ,cultural and others on utilization of ICT as a tool of Teaching-Learning. B.Klimova [4] studied about ICT versus traditional way of teaching and found that ICT based teaching provides better way of understanding the topics. Other authors [5] devoted their research on use of ICT in Teaching-Learning at school level, the study is based on Maths teaching, after the analysis they concluded that technologies make learning environment alive and more attractive. S. E. Aduwa-Ogiegbaen et. al [6] have reported about hurdles on utilization of ICT in Nigerian secondary schools and found that Nigerian schools are facing problems due to lack of trained human resources ,lack of ICT based infrastructure and funding from government. Many other authors [5][7][8] have studied about use of ICT in Teaching-Learning process. A. Sari and et al. [1] have concentrated their research on impact of ICT application through learning process in higher education. The study is carried for one of the American university. Literature proves the utilization of ICT in Teaching-Learning process by both teachers as well as of students it has already been proved that ICT plays vital role in education system and may improve quality of teaching ,level of understanding , ease of access of study materials ,Fast communication of information and finally improves the academic performance of the students.

This paper briefly explores about the utilization of ICT in the students' perspective i.e for learning process and aims to analyze the effectiveness of it in terms of academic performance of the students. It is tried to explain how the three target groups are different on their opinion about utilization of ICT in learning process. The targets groups are as (1) Male Vs Female (2) University students Vs College students and (3) PG Vs UG students . In order to analyze the results three hypothesis are established and results are drawn. Apart from this , the availability of infrastructure at the institute where student are studying and the experiences of the students on utilization of ICT have also analyzed. The results are presented in form of bar chart.

## II. METHODOLOGY

The method of questionnaire was employed in this study

### A. Instrument (Questionnaire)

Questionnaire was developed by the group of professor of computer science and education it is also compared with other Questionnaire available in the literature , in the Questionnaire all necessary questions are incorporated so that it can reflect the objective of the research in well manner. The Questionnaire consists four different parts as explained in more detail as below:

Part 1: This part consists demographic detail of the students like name ,gender, type of students and level of class etc. ,so that the objective can be studied into three different groups i.e. for Male and Female ,For university and College students and for PG and UG level students.

Part 2: This part of the question reflects about availability of ICT related infrastructure not only at the institutions where students are studying but also at their home for round the clock access of ICT for learning. This part ensures about availability of ICT related tools like laptop,desktop ,LCD projector ,Internet Wi-Fi ,institutional web site etc. There are 10 questions in all in this part with only two options "Yes" and "No".

Part 3: Question in this part are related to utilization of ICT tools ,various questions of this part ensures about effective utilization of ICT tool by the students. There are two parts in this ,first part consists questions related to learning activities with three different options: Always, Often and Never while another part consists questions related to confidence level of the students to utilize software ,E-mail, exploring web site ,cloud storage etc. with three options namely full confidence ,less confidence and no confidence.

Part 4: The main objective of the proposed research work is to analyze students perspective on utilization of ICT to improve academic performance of the students, are carried out with the help of 35 questions in this part. These questions collects the data which clearly reflect the opinion of the students whether ICT can help in improving the academic performance or not. The students gives the answers of these questions based on their experiences in this field with three options: Always, Occasionally and Never.

### B. Data Sample

The total number of questionnaires distributed among the target students was 150, proper care was taken while collecting sample so that objective of the research may not be biased due to lack of data related to a particular group and the data will be of balanced in nature. Response rate was 100% among them 76 students were Male while 74 were Female , 74 students were from University while 76 students were from College and 77 students were of PG classes while 73 students were of UG classes. The respondents are from colleges both from private and government as well as from university.

### C. Data Analysis and Method

To analyze the data statistical method, t-test is mainly used, in order to calculate t-test mean and standard deviation are calculated with the help of standard formulae.

## III RESULT ANALYSIS

Collected data are entered into the Excel sheet with the help of decided indicators. As stated part 2 explains about availability of ICT related infrastructure at the institution as well as at the home and is presented question wise in Table I, say for example 100 % respondent agreed about the availability of Desktop/Laptop (Q. No 1) at their institution while 73.33% respondent are having Desktop/Laptop at their home (Q. No 2) similarly other data are shown question wise in Table II one important reflection about the availability of LCD projector at institution is responded with 100 % response, it means all the institutions are having LCD projector.

### A. UTILIZATION OF ICT

The data related to part 3 of questionnaire are analyzed and presented in form of Figures. Figure I shows comparative bar chart related to the question "Exploring you tube for learning the topics" in between Male and Female students, from this Figure it is clear that there is no major difference on utilization (Always) of you tube for learning in between Male and Female students ( 39.47% for Male and for 37.84% Female),similarly 39.47% Male often use you tube while 43.24% Female often use you tube and 21.05% Male and 18.92% Female never use you tube for accessing learning material. If we will compare the same question for other group (University and college students- See Figure II), trends are almost similar, also there is no significant difference on utilization of you tube in between PG and UG students (See Figure III). Hence we can conclude that on utilization of you tube for accessing learning material ,there is no major differences in case of all the above three groups. If we will observe question No. 12 related to "Exploring and searching web site to get learning materials" presented in graphical form in Figure IV, V and VI ,there is marginal difference in between Male and Female students while there is no difference in case of University and College students and PG and UG students. It means Male students are more confident to explore web site to get learning material as compare to Female students but this is not true for other two target groups.

Table I: Data related to part 2 of questionnaire answered as Yes or N.

Q. No	No. of Yes	% of Yes	No. of No	% of No
1	150	100	0	0
2	110	73.33	40	26.67
3	125	83.33	25	16.67
4	125	83.33	25	16.67
5	102	68	48	32
6	150	100	0	0
7	100	66.66	50	33.34
8	100	66.66	50	33.34
9	90	60	60	40
10	60	40	90	60

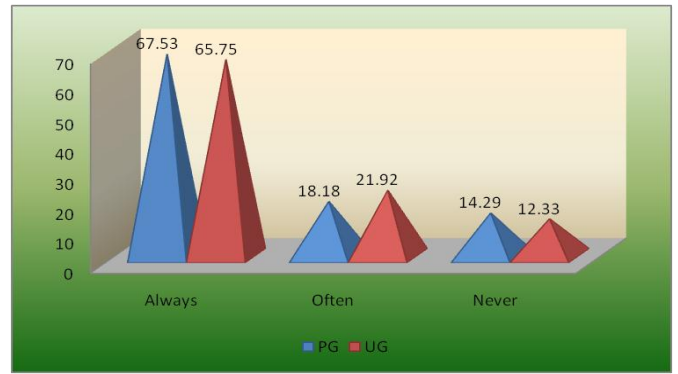


Figure III: Comparative bar chart for question “ Exploring you tube for learning the topics” under part 3 of questionnaire for PG Vs UG College students.

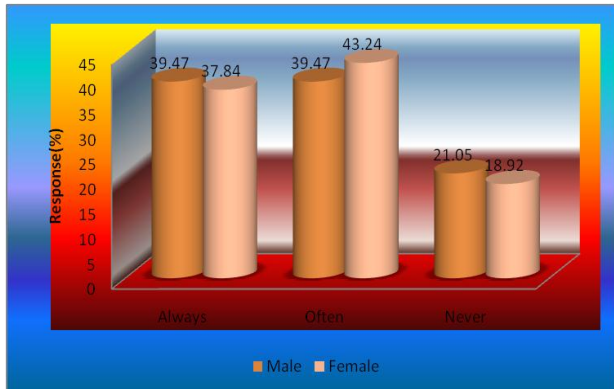


Figure I: Comparative bar chart for question “ Exploring you tube for learning the topics” under part 3 of questionnaire for Male Vs Female .

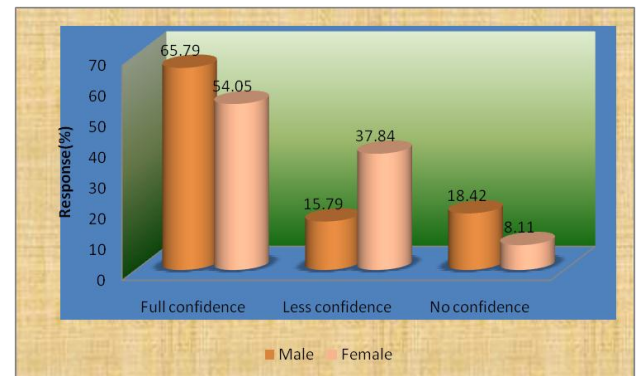


Figure IV: Comparative bar chart for question “ Exploring and searching web site to get learning material” under part 3 of questionnaire for Male Vs Female

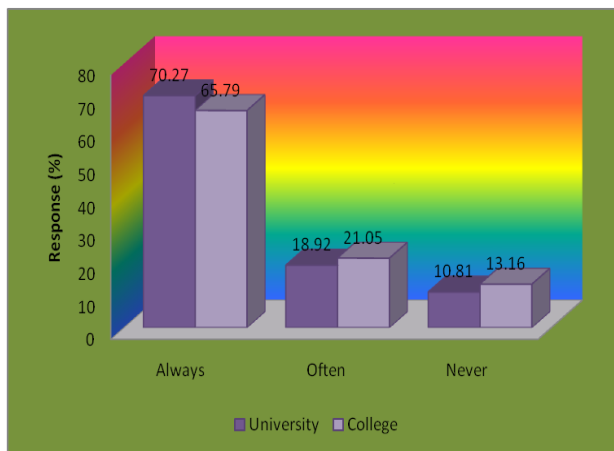


Figure II: Comparative bar chart for question “ Exploring you tube for learning the topics” under part 3 of questionnaire for University Vs College students.

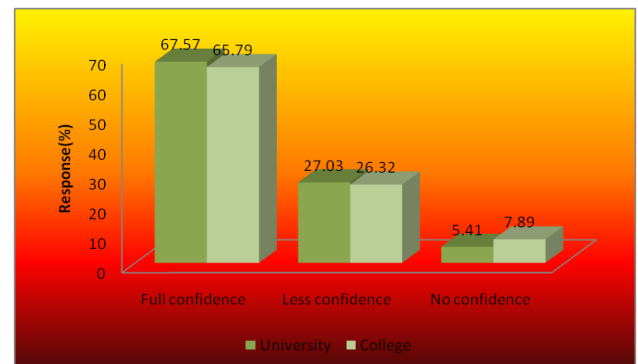


Figure V: Comparative bar chart for question “ Exploring and searching web site to get learning material” under part 3 of questionnaire for University Vs College students.

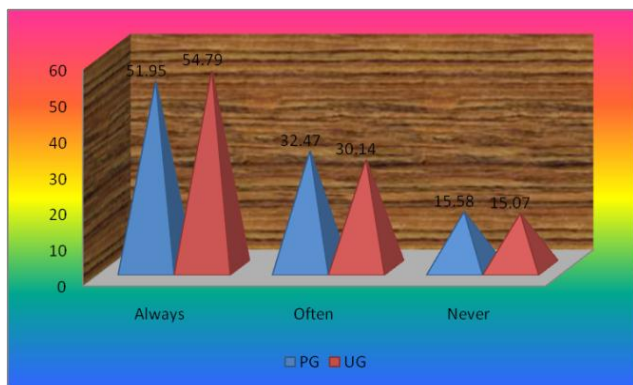


Figure VI: Comparative bar chart for question “ Exploring and searching web site to get learning material” under part 3 of questionnaire for PG Vs UG .

**B. RESEARCH HYPOTHESIS**

In order to achieve research objective three hypothesis are established for comparing the opinion of three different groups on effective utilization of ICT in learning for the academic improvement of the students. The hypothesis are as follows:

Null Hypothesis -1 (HO1):There will be no significant difference in between Male and Female students on their perspective on effective utilization of ICT in learning process to improve academic performance of students.

Null Hypothesis -2 (HO2):There will be no significant difference in between University and College students on their perspective on effective utilization of ICT in learning process to improve academic performance of students.

Null Hypothesis -3 (HO3):There will be no significant difference in between PG and UG students on their perspective on effective utilization of ICT in learning process to improve academic performance of students.

Collected data are stored in Excel software and weights were assigned and Mean, standard deviation and t-value are calculated.

HO1 (Male Vs Female):The first hypothesis is related to Male and Female to analyze how these two groups differ in their opinion on utilization of ICT in learning process to improve academic performance of students. As shown in Table II ,calculated mean for Male and Female are respectively 75.17 and 70.81 respectively while standard deviation are 17.28 and 15.79 for Male and Female respectively ,based on these value calculated t-value is 1.61 as shown in Table II. A comparative Mean and standard deviation are also shown in Figure VII. Also the value for degree of freedom (df) is calculated as 148 ,based on this df we found t-value (When observed from the t-table) as 1.645 at significant level 0.05 and 2.326 at significant level 0.01. Since these values are higher than the calculated t-value (1.61) ,hence null hypothesis is accepted, on the other words we can say that no significance difference exists on students’ perspective on utilization of ICT in learning process to improve academic performance of students i.e both male and female students are having same opinion on this issue.

Table II: Data related to Null Hypothesis -1 to find out significant difference in between Male and Female students.

Gender	Sample size	Mean	Standard Deviation	dF	t-Value	Remark
M	76	75.17	17.28	148	1.61	Hypothesis accepted at both the levels: 0.05 and 0.01
F	74	70.81	15.79			

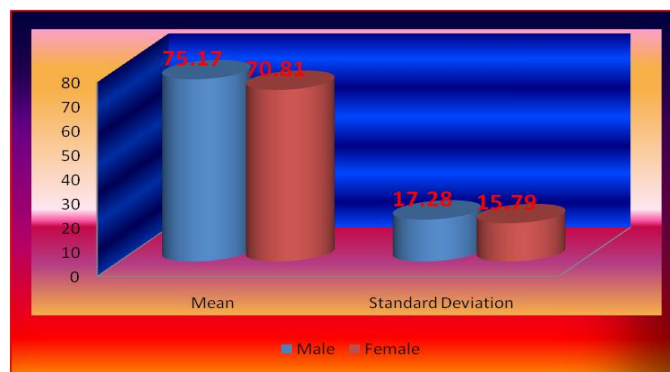


Figure VII: A comparative bar chart showing mean and standard deviation for Male and Female students

HO2 (University Vs College):The second hypothesis is related to do analysis in between University and College students to know how these two groups differ in their opinion on utilization of ICT in learning process to improve academic performance of students. Table III and Figure VIII show the data calculated for this purpose i.e mean for University and College are respectively 71.09 and 65.85 while standard deviation are 18.82 and 17.51 for University and College students respectively , t-value is then calculated as 1.76.This t-value is compared with table’s t-value for df=148 (1.645 at significant level 0.05 and 2.326 at significant level 0.01).Calculated t-value is higher than table’s t-value at 0.05 significant level while it is less at significant level 0.01. hence null hypothesis is rejected at 0.05 significant level while it is accepted at 0.01 significant level .The following conclusion can be made from the above discussion .At 0.05 significant level significance difference exist i.e. there is difference in between University and College students’ perspective about the utilization of ICT in leaning process to improve academic performance of students while this significance difference does not exist at 0.01 significance level ,it means both University and College students are having same opinion on this issue for this significant level.

Table III: Data related to Null Hypothesis -2 to find out significant difference in between College and University students

Institute Level	Sample size	Mean	Standard Deviation	dF	t-Value	Remark
University	74	71.09	18.82	148	1.76	Hypothesis rejected at 0.05 level but accepted at 0.01 level
College	76	65.85	17.51			

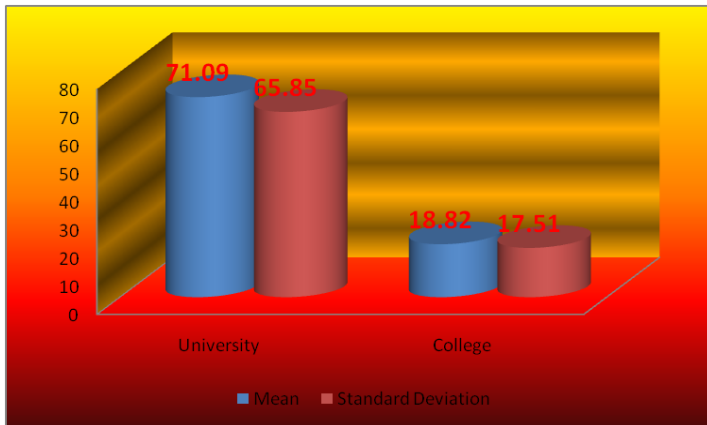


Figure VIII: A comparative bar chart showing mean and standard deviation for University and College students.

HO3 (PG Vs UG): This hypothesis is established to see the significant difference of students' perspective on effective utilization of ICT as learning to improve academic performance of students in between PG and UG students. Data are shown in Table IV and Figure IX, calculated mean for PG and UG are respectively 73.42 and 63.17 while standard deviation are 17.52 and 17.72 for PG and UG students respectively, based on these value calculated t-value is 3.55 which is higher than table's t-value at both the significant levels, hence null hypothesis is rejected, on the other words we can say that significance difference exists on students' perspective on utilization of ICT in learning process to improve academic performance of students in between PG and UG students i.e both PG and UG students are having different opinion on this issue.

Table V: Data related to Null Hypothesis -3 to find out significant difference in between PG and UG students.

Class level	Sample size	Mean	Standard Deviation	dF	t-Value	Remark
PG	77	73.42	17.52	148	3.55	Hypothesis rejected at both the levels :0.05 and 0.01
UG	73	63.17	17.72			

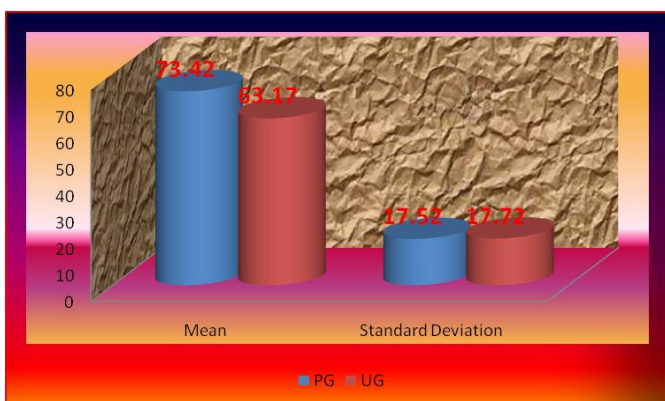


Figure IX: A comparative bar chart showing mean and standard deviation for PG and UG students

### III CONCLUSION AND FURTHER RESEARCH

In the field of education ICT has great importance in both teaching and learning process and it may improve the academic performance of the students. The present paper analyzed this facts with the help of self developed questionnaire and studied the objective for three different groups. It is concluded that although there are sufficient infrastructure available for utilization of ICT, students are not utilizing it in proper way to fulfill their academic need also there perception on utilization of ICT for their academic improvement are different in case of different target groups. In future this study may be extended for more diversified group of students and also the academic performance of students may be analyzed in real sense.

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