

Attitude of Students towards Information Technology and Science Education

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ABSTRACT

Information technology (ICT) has connected the world including students throughout world and it has become the central drive for the evolution of a modern society. The Information and communication technology has witnessed a fast growth and has changed traditional form of libraries to digital form. At present throughout world, the most popular source of information is the internet and e-resources. In the present study, conducted in Kashmir valley of J&K State, quantitative approach with survey design was used. The survey included 400 students selected at random from different educational institutions of the Kashmir valley. To examine attitude of students towards Information Technology and science education, a well-designed questionnaire was used for the collection of data and the data collected was analyzed using SPSS software. The results of the study, revealed that number of internet users increase continuously. Statistically, nonsignificant difference was observed between male and female respondents towards the use of e-resources for learning and entertainment purpose. The study further, revealed that students both males and females were of the opinion that knowledge of IT is very important for science education. Finally, problems faced by students related to use of e-resources were discussed.

Keywords: *Information technology; Attitude, Science Education, Internet; software*

INTRODUCTION

Information Technology (IT) refers to the hardware and software used in computerized information systems and at present has been a major force in shaping the society (Bawaneh, 2011; Safdar et al., 2012). It is clear that the revolution of information technology during the last three decades has changed the face of the world and had led to the development in all fields (Bilal et al., 2016). Technology is pervasive, and it is

invading every corner of the earth, albeit some areas more slowly than others(**Kompf, 2005**). Nothing is static in this world, everything changes almost after every second of the day, so should be teaching and learning. Gone are the days when teaching and learning is only based on chalk and books packed somewhere called library. Today everything has gone computerized to retrieve, store and transmit information. Countries of the world such as UK, Austria, Finland, Sweden and Denmark, teachers and students have a generally positive attitude towards e-learning and relatively advanced IT competences (**EU, 2005**). Importance of IT in our society is enormous as it is not restricted by boundary, language and culture. However, Jammu and Kashmir State is of an underdeveloped in the field of technology use and it might be due to the risks and high costs. It is important to note that absence of scientific knowledge and IT in any educational system makes such educational system as old as centuries behind the present age. There is a need for educators to understand students' attitudes toward the use of different types of technology as well as how these attitudes are related to their learning style. Furthermore, students' performance is one of the key contributing factors determining the student's success in various subjects and areas (**Shukakidze, 2013**). Generous investments were supported by the strongly held premise that technology can help students learn more efficiently and effectively, and as a result increase student academic performance (**Lei, 2010**). In fact, technology becoming a more prevalent part of the education culture with each passing year, the integration of technology into education systems is forcing colleges and universities to make dramatic changes, by increasing the quality, diversity and availability of information, and altering the teacher-student relationship (**Inoue, 2007**). It is reported that technology impacts students' daily lives and certainly plays an important part in developing students' positive and negative attitudes (**Volk, Yip, & Lo, 2003**). The lack of Information technology facilities has led most of the students to become unfamiliar with using them and to have low behavioral attitudes towards using computers. Hence, there is a need to look at students' attitudes toward information technology and science education whether negatively or positively. Attitude in this study refers to three components, such as affection, behavior, and cognition. Affection refers to feelings of an individual associated with an attitude object, cognition

refers to individual beliefs or attributes associated with an attitude object, and behavior refers to past behavior or behavioral intentions relevant to an attitude object (**Huskinson and Haddock, 2006**). There is a vast literature available on the topic students attitude towards Information technology (e.g., **Tingoy and Gulluoglu, 2011; Wong and Hanafi 2007; Muslim 2010; Shunnaq and Domi 2010; Al-Harby, 2012; Yalman & Tunga, 2014; Subramani, 2012; Abedalaziz, Jamaluddin, and Leng 2013; Lei 2010**). **Aljabri (2012)** reported that students use all the applications in the same way and there is more use of social networking programs such as Google translator, YouTube, Facebook, MSN, e-mail and mobile, but no significant correlation between the level of use of application software and students' academic performance were found. Many studies have been conducted indicating the students' attitudes towards IT and the influences on academic performance and the results obtained were mixed. There is no doubt that IT tools facilitate communication among students, between students and instructors, even beyond the classroom experience to distant students and instructors. In view of the literature discussed above and knowing the importance of IT in every field, we chose this area for study in Kashmir valley with the following objectives:

- i. There is no significant difference in Academic performance of students and time spend on e-resources
- ii. There is no significant difference in attitude towards information technology between Science and Art subject students
- iii. There is no significant difference in attitude of students towards science education and information technology
- iv. There is no association between study habits of students and subjects chosen for the study.

MATERIAL AND METHODS

In the present study conducted at Kashmir valley of J&K State, we use quantitative approach with survey design. The survey included 400 students, studying in various higher educational institutions of Kashmir valley and using e-resources. To collect information, a questionnaire was prepared keeping in view the literature available on the

topic (Christensen & Knezek, 1998; Mustafa, 2005; Rob, Mary, & Grainne, 2012; Wong & Hanafi, 2007). The questionnaire developed for the present study was pre-tested and validated by specialists and experts using appropriate statistical techniques. Each participant selected at random was asked to fill out a questionnaire which asked questions about their residence, source used for learning IT and academic performance. The students who participated in this study were given a verbal explanation regarding the purpose of the study and were assured that confidentiality would be carried out throughout this study. The data collected were tabulated and analyzed with the help of standard statistical tools like graphical presentations, descriptive statistics, chi-square test and t-test using SPSS software.

Research Hypotheses

Hypothesis 1: There will be no significance difference in academic performance between Science and Arts stream students. In order to test the Hypothesis 1, Students t-test (with usual notations) was used and is given by

$$t = \frac{\bar{x} - \bar{y}}{\sqrt{s^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}} \quad \text{where } s^2 = \frac{[\sum (x_i - \bar{x})^2 + \sum (y_i - \bar{y})^2]}{n_1 + n_2 - 2}$$

Hypothesis 2: There is no association between study habits and subjects chosen for the study.

To check the association between subjects and study habits, we use chisquare test given as

$$X^2 = \sum_{i=1}^2 \frac{(o_i - e_i)^2}{e_i}$$

where $X^2 \sim \chi_1^2$, o_i and e_i are observed and expected frequencies. We reject H_0 if p-value is less than specified level of significance.

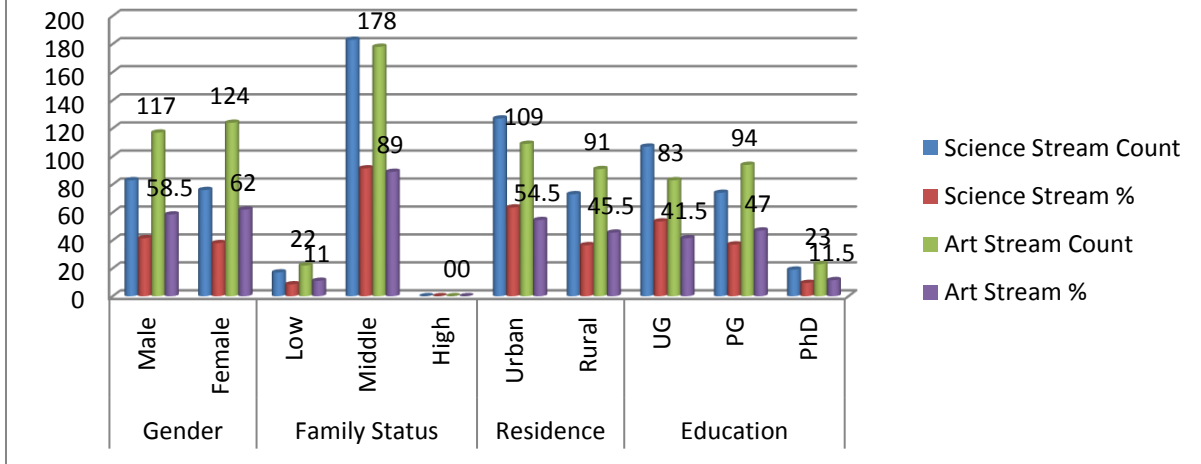
RESULTS AND DISCUSSION

The data presented in Table 1 shows the distribution of study population as per the characteristics Gender, Family status and habitat. It is observed that majority of the respondents were female, from middle class families and were from urban areas. Statistically, non-significant difference was observed between the students of Science and Art stream ($p>0.05$).

Table 1: Characteristics of the studied population

Characteristics		Science Stream		Art Stream		Chisquare	p-value
		Count	%	Count	%		
Gender	Male	83	41.5	117	58.5	0.512	>0.05
	Female	76	38	124	62		
Family Status	Low	17	8.5	22	11	0.710	>0.05
	Middle	183	91.5	178	89		
	High	0	0	0	0		
Residence	Urban	127	63.5	109	54.5	3.348	>0.05
	Rural	73	36.5	91	45.5		
Education	UG	107	53.5	83	41.5	5.793	>0.05
	PG	74	37	94	47		
	PhD	19	9.5	23	11.5		

Figure 1: Distribution of the studied Sample



The data presented in Table 2, shows that 29.5% science students use Desktop, Laptop and Mobile, 40.5% students Laptop and Mobile, 18.5% students use only Mobile and 11.5% students use Mobile and Tablet for using e-resources. Further, it is noticed that among Arts students 31.5% students use Desktop, Laptop and Mobile, 25% students use Mobile only, 33.5% students use Laptop and Mobile, 9.5% students use Mobile and Tablet for using e-resources. Statistically, non-significant difference was observed between the students of science and art stream ($p > 0.05$). The reason may be the nearly the equal awareness of students and the same facilities available at home or in the Universities. In case of variable time spend in using e-resources there is a significant difference among the Science students and Art students ($p < 0.05$) and nonsignificant difference ($p > 0.05$) in case of preference given to T.V. watching.

Table 2: Use of Information Technology resources by Science and Art Students

Characteristics		Science Students		Art Students		Chi-square	p-value
		No.	%	No.	%		
Gadget(s) available for e-	Desktop+Laptop+Mobile	59	29.5	63	31.5	4.063	>0.05
	Laptop+Mobile	81	40.5	67	33.5		

resources	Mobile+Tablet	23	11.5	19	9.5		
	Mobile	37	18.5	51	25.5		
	e-Book Reader	0	0	0	0		
Time Spend in using for e-resources	Daily	107	53.5	73	36.5	12.923	<0.05
	2-3 times a week	27	13.5	38	19		
	Once a week	34	17	39	19.5		
	1-2 times a month	13	6.5	17	8.5		
	Depends on Need/Mood	19	9.5	33	16.5		
T.V. Channels watching (first preference)	News	17	8.5	23	11.5	6.343	>0.05
	Science	31	15.5	25	12.5		
	Movie	79	39.5	89	44.5		
	Islamic	24	12	29	14.5		
	Sports	43	21.5	27	13.5		
	Any other	6	3	7	3.5		

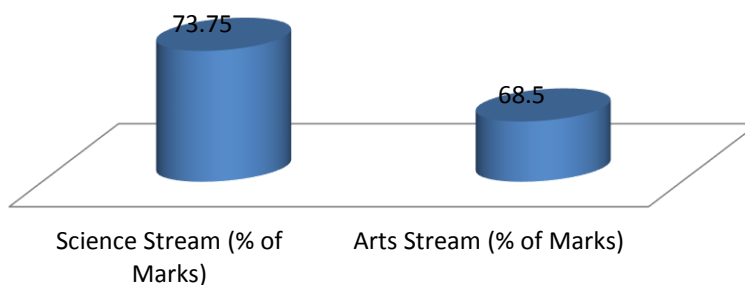
The data presented in Table 3 reveals that in case of attitude towards information technology, there is a significant difference in case of item (i) and (iii) ($p < 0.05$) and non-significant difference in case of item (ii) ($p > 0.05$). In case of Intentional Behaviour towards Information Technology, there is a significant difference in case of items (i), (iv), (v) and (vi) ($p < 0.05$). Further, in case of Cognition towards Information Technology, there is a significant difference in case of item (ii) ($p < 0.05$) and non-significant difference in case of item (i) and (iii) ($p > 0.05$).

Table 3: Attitude, Behaviour and Cognition of students towards Information Technology

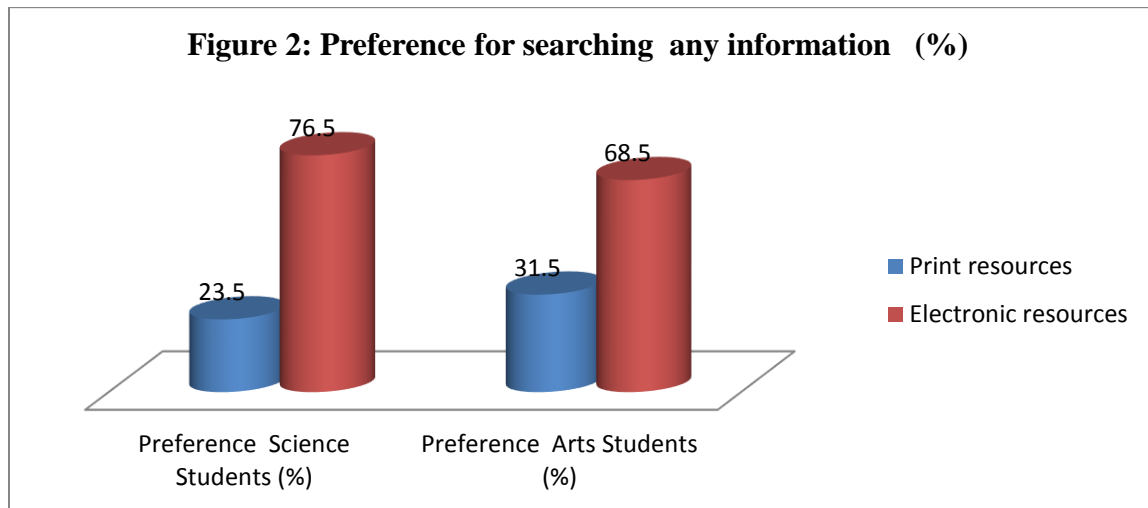
Dimensions	Science Students (n=200)			Art Students (n=200)		Chi-square	p-value
	Items	Yes	No	Yes	No		
Attitude toward Information Technology	i). I believe that IT gives me opportunities to learn many new things	195	5	183	17	6.923	<0.05
	ii). I use internet more for pleasure than for doing my assignments	123	77	141	59	3.610	>0.05
	iii) Learning the internet is enjoyable	194	6	184	16	4.810	<0.05
Intentional Behaviour toward Information Technology	i). The use of the internet is important for students to access more information	195	5	182	18	7.797	<0.05
	ii). Every student should be able to know how to use internet	200	0	200	0	NA	NA
	iii). I like to setup my email account myself	200	0	200	0	NA	NA
	iv). The internet makes me feel happy	189	11	172	28	8.211	<0.01
	v). IT makes me more effective	187	13	171	29	6.810	<0.05

	learner						
	vi). I use IT to communicate and share information with my colleagues	186	14	157	43	17.206	<0.01
Cognition towards Information Technology	i). IT allows me to have all the information I need for my studies	81	11 9	73	127	0.676	>0.05
	ii). I believe that IT makes the study activities more interesting	181	19	163	37	6.728	<0.05
	iii) IT gives me control over things I want to do in my studies	139	61	117	83	5.251	<0.05
	iv). I learn more from IT than I do from books	34	16 6	23	177	2.746	>0.05

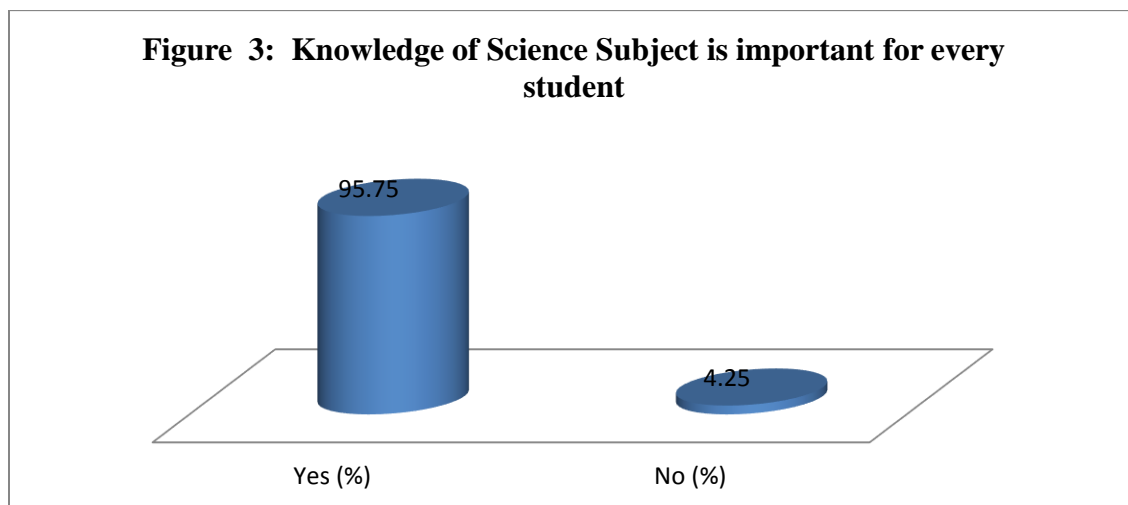
Figure 1: Academic Preference of Students Streamwise



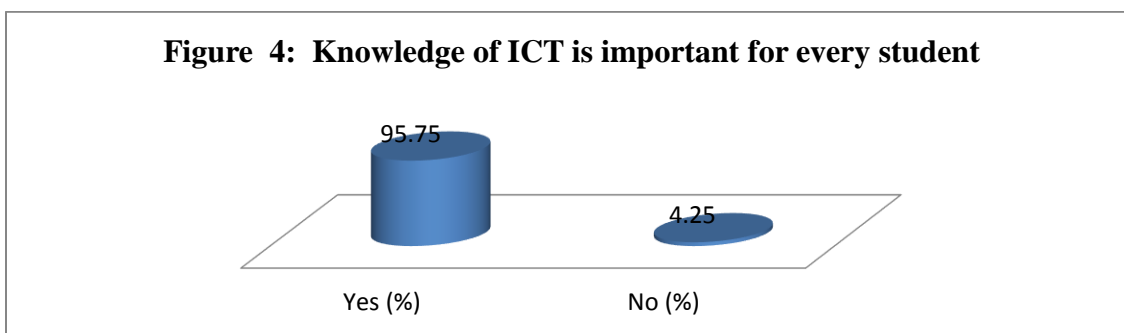
The data presented in Figure 1, shows the average distribution of marks scored by science and Arts stream students. Science students got 73.5% marks and Arts students got 68.5% marks on average.



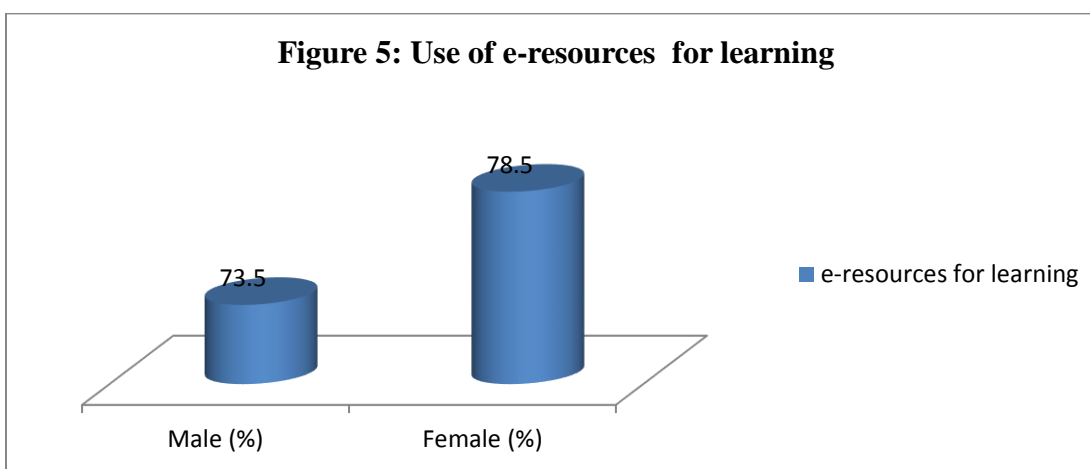
The data shown in Figure 2, reveals that 76.5% Science students and 68.5% Arts students gave first preference to electronic resources and statistically a significant difference in the responses is observed between the students of two subjects ($p < 0.05$).



The data presented in Figure 3 shows the 95.75% respondents are of the opinion that knowledge of science subject is important for every student.



The data presented in Figure 4, shows the 95.75% respondents are of the opinion that knowledge of ICT is important for every student.



The data presented in Figure 5, shows the 73.5% male and 78.5% female respondents told that they are using e-resources for learning and purpose.

Table 4 : Study habits of Science and Arts Stream Students

Study habits	Time spend (Hrs.)	Number of respondents(Science stream)	Number of respondents(Arts stream)	Chi-square	P-value
Time spend in reading/internet(daily)	< 1 hr	42	56	3.363	>0.05
	Up to 2 hr.	227	231		
	>2 hrs	131	113		
Time spend in watching T.V.	< 1 Hr	39	28	44.234	<0.01
	Up to 2 hr	213	88		

(daily)	Up to 3 hr	113	143		
	>3 hrs	35	41		

The data presented in the Table 4, shows that statistically there is a non-significant difference in the habit of reading/internet between arts and science stream students($p > 0.05$) However, there is a significant difference in the habit of time spending in watching T.V.($p < 0.01$).

CONCLUSION

Education system should focus on the student behaviour, ensuring development and acquisition of high-quality knowledge, skills and competencies appropriate to life in the 21st century. The thrust of quality education by all standards of understandabilities should be on the wider use of modern information technology.

The findings of our study, showed that participants from science and arts stream showed positive attitudes toward the use of Information Technology. It could be attributed to the home computer ownership among students, which may have contributed their Information Technology attitudes in a positive direction. This results of our study are in agreement with the earlier studies (Al-Harby (2012) and Yalman and Tunga (2014)). The study showed slightly significant difference between Arts and Science students in their attitude towards Information Technology, in favor of Science students. This finding is consistent with the previous literature (Subramani, 2012) and inconsistent with (Abdelaziz, Jamaluddin, & Leng, 2013). The study also found no significant difference between Art and Science students in terms of their affection towards IT and Science education. The Science students appeared to be more confident in using computers and participating in the activities related to Information Technology, their academic performance was good as compared to Art students ($p < 0.05$). This finding was in agreement with the studies Taylor and Duran (2006); Schroeder et al. (2007); Juma and Ahmed (2012); Skryabin, Zhang, Liu, and Zhang (2015); Akpınar et al. (2009). It could be concluded that students have used ICT more for communications and entertainment itself, not to fulfil the aim of the learning process, they are busier with the social network such as Facebook, YouTube, and others, instead of using the Internet to do research (rarely), downloading electronic resources, and launching into e-mail communications;

whereas university which does not offer Internet connection to them and they are usually self-sponsored. The result indicated little evidence that students with high affection towards ICT tend to score higher grades in their exams. Therefore, the findings of this current study hold some implications for policy makers to pay attention to the students and facilitate certain conditions in order to encourage students to use IT in their learning by enhancing their affection and beliefs towards using IT.

Limitations of the Study

In this study, the sample size is very less so for future study needs more samples. Gender-wise comparison based on large sample should be made.

Recommendations

The following recommendations have been made based on the results and conclusions of this study.

- i. Further studies using the quantitative and qualitative approaches to find out the relationship between students' attitude towards ICT with their academic performance are necessitated to draw several implications.
- ii. The students' motivation issue was not addressed in this study; it would be beneficial to investigate students' motivation in their learning through interview or survey. Student motivation would provide another data source to support the improvement of their academic performance.
- iii. Government should support teachers and make it mandatory for all teachers to attend seminar, workshop, conference and refresher course in computer.
- iv. IT centre should be established in every institute and funds be made available to purchase computers and other IT equipment.
- v. This study has investigated the differences between the field of study (Arts and Science) in terms of attitude towards IT, future research may focus on the other factors like gender as well as computer and Internet experience.

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