

Attitude Towards ICT: Role Of Gender, Socio-Economic Status And Academic Performance

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Abstract

The tremendous breakthroughs in technology are revolutionizing traditional teaching approaches and ushering in a new era of education. The current investigation was done to check the attitude of students towards ICT with respect to their gender, socio-economic status (SES) and academic performance. Attitude towards ICT has been taken as dependent variable while Gender “(Male & Female)”, SES “(High & Low)” and Academic Performance “(High & Low)” have taken as independent variables. In the current investigation “Descriptive survey method” was employed. “Multi-stage random sampling technique” was used to choose the sample of 800 sr. sec. school students studying in XI and XII standard in various schools of North West B-II schools of Delhi were taken. Attitude towards ICT Scale Developed by the Investigator herself. “Socio-Economic Status Scale (SESS) (Kalia & Sahu, 2012)” was applied to gather the data. In order to calculate the academic performance scores, the researcher had to rely on the school's examination record for the students' prior test scores, specifically their 10th grade results. Three Way ANOVA using a 2×2×2 factorial design was used to examine the collected data. Result of the study revealed that the interaction effect of gender, socio-economic status (SES) & academic performance on attitude of sr. sec. school students towards ICT was found to be significant. This study would benefit students' overall development in addition to improving the usage of ICT in the classroom.

Keywords: Academic Performance, Attitude towards ICT (Information and Communication Technology), Gender, Socio-economic Status.

INTRODUCTION

In today's fast-paced, dynamic world, the role of ICT in education has become increasingly significant. The amazing advances in technology are transforming traditional teaching methods and ushering in a new era of education. ICT is changing the face of education by creating immersive virtual reality experiences and interactive internet platforms that make learning more accessible, interesting, and customized than in the past. The use of ICT tools and resources in the teaching-learning process is referred to as ICT in education. ICT has proven to be an effective instrument for changing how teachers and students are taught. To improve and assist educational activities, a variety of digital technologies are employed, including computers, tablets, smartphones, interactive whiteboards, instructional software, online platforms, and internet access. Students utilize ICT as a tool to choose learning topics, work through problems, and provide antonym explanations during the learning process. One's positive or negative assessment of a specific topic is referred to as their attitude. "Attitude toward ICT" refers to a person's opinions, feelings, and convictions regarding ICT. In both their personal and professional lives, it encompasses an individual's willingness to accept, use, and embrace technology. "Students who learn using ICT are better able to use instruction and data from a variety of sources and critically evaluate the caliber of learning resources. Create an innovative learning environment ICT helps students gain new knowledge in their subject areas" (Chai, Koh, & Tsai 2010).

The incorporation of ICT has been a prominent issue in educational research since the early 1990s. The adoption of ICT in vocational education, along with primary & secondary schooling, is increasing swiftly across the globe, yet its distribution remains uneven among different nations (OECD, 2015). Educational institutions are exploring innovative methods to embed ICT competencies into their policies & curricula to enhance the teaching-learning experience in line with "twenty-first-century skills" (Anderson, 2008). Hu, et al. (2018) demonstrated that students' use of ICT for educational purposes correlated positively with their performance, while the use of ICT for entertainment resulted in a negative correlation. Since student demographics are rapidly shifting, ICT has a significant impact on many spheres of society, including political, economic, and social ones, where education is a key tenet. ICT is defined by UNESCO as an engineering and technological field that handles information using managerial and scientific methods (Ratheeswari, 2018). Attitudes are beliefs, ideas, and thoughts that direct behavior of students, affect the learning process and also affect academic performance of students. Lennon, et.al. (2003) described ICT as "the interest, attitude, and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate, and evaluate information; construct new knowledge; and

communicate with others in order to participate effectively in society”.

The term "information and communication technology" (ICT) is made up of three words: information, communication & technology. **Information means** the nature of information includes things like what information is, how it is controlled, and its value. **Communication refers** to the exchange of electronic data, typically across a distance. **Technology refers** to “the creation, modification, use, and knowledge of tools, machines, techniques, crafts, systems, and organizational methods”. Socio-economic status is “A notion that is typically represented by the education level, job type, and earnings of parents”. Sirin (2005) considered SES to be “an individual's or a family's ranking on a hierarchy according to access to or control over some combination of valued commodities such as wealth, power, and social status”. Gender can have a significant impact on attitudes towards ICT and how it is used, with some studies finding that men have more positive attitudes than women. Gender can impact attitudes towards ICT, with men generally having more positive attitudes than women. Learning is becoming more dynamic and interesting thanks to ICT tools and resources. Virtual reality experiences, instructional videos, simulations, and multimedia presentations can all help make learning more engaging and memorable by bringing abstract ideas to life.

Students can actively engage in the learning process through interactive whiteboards, educational software, and online platforms, which encourage creativity, critical thinking, and problem-solving. The way students perceive their autonomy in using ICT is closely linked to their academic success. Women generally exhibit less positive attitudes toward technology (Sáinz & López-Sáez, 2010; Tondeur, 2016b). Numerous disparities that exist between women & men regarding access, participation, utilization, & control over ICT-related resources, goods, & services (Anguita & Alario, 2006). A positive attitude towards ICT is associated with higher academic performance. Students with a positive attitude towards ICT are more likely to: Engage with online course materials, Participate in online discussions and activities, Seek out additional resources, and Develop digital literacy skills. ICT can improve academic performance by: Enhancing retention capability, Improving understanding, Providing a better learning process, and Improving attitudes towards learning. ICT can also help students develop digital literacy skills, which are important for success in the modern workforce.

In the current digital era, where technology is being incorporated into education more and more, it is imperative to investigate students' attitudes toward ICT. In order to create and execute

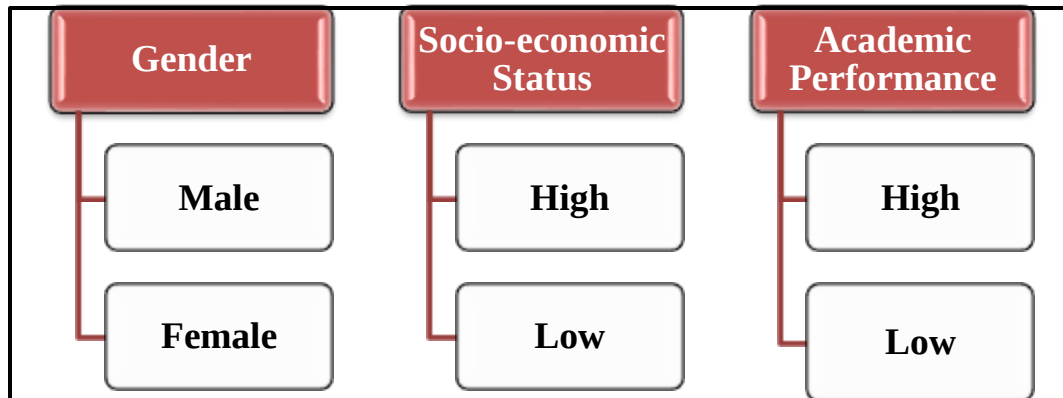
technology-enhanced learning initiatives that suit students' preferences and objectives, educators must have a thorough understanding of their attitudes toward ICT. Students' learning experiences and academic progress may be improved by having a good attitude toward ICT. On the other hand, a negative outlook could make it more difficult for them to succeed academically. In order to find potential obstacles and chances for improving their digital literacy and encouraging a favorable attitude toward technology in education, it is necessary to look into students' attitudes toward ICT. Education is no longer restricted to classrooms these days because distant learners can fulfill their aspirations of readily connecting with one another through the use of computer technology. Learning should be engaging and interactive if a teacher uses audio-visual methods to convey their material. Computer-assisted instruction also adds a playful element to education. ICTs in secondary education have a significant impact on every aspect of the educational process, from investment to the application of technologies to address the important concerns of quality, innovation, pedagogy, equity, management, and efficiency. Research on students' attitudes toward information and communication technology is scarce. Thus, the researchers decided to study this topic.

OBJECTIVE: “To find out the interaction effect of gender, socio-economic status and academic performance on attitude towards ICT of senior secondary school students.”

H₀₁ “There is no significant interaction effect of gender, socio-economic status and academic performance on attitude of senior secondary school students towards ICT .”

DESIGN AND METHODOLOGY

“In the present study, descriptive survey method was used. The 2×2×2 factorial randomized group design was used to analyze the data. All the independent variables i.e. Gender (Male & Female), Socio-economic status (High & Low) and Academic Performance (High & Low) were varied at the two levels as given below”.



SAMPLE

“In the present study, multi-stage random sampling technique was used to select the sample of 800 senior secondary school students studying in North West B-II schools of Delhi.”

TOOLS USED

- **Socio –Economic Status Scale (SESS)** (Kalia & Sahu, 2012).
- **Scale for attitude towards ICT:** This scale is developed and standardised by the researcher herself.
- **Academic Performance:** For the Academic performance measure, the researcher had to depend upon the school examination record of the respective school of their previous test scores i.e. 10th.

STATISTICAL TECHNIQUES

“The Three-Way Analysis of Variance (ANOVA) with 2×2×2 Factorial Design was computed using SPSS 20 version to study the interaction effects of the independent variables i.e. Gender, Socio-economic status and Academic Performance on Attitude of senior secondary school students towards ICT. Wherever F-value was found significant, ‘t’-test was employed for further investigation”.

DATA ANALYSIS & INTERPRETATION

“To study the interaction effect of gender, socio-economic status & academic performance on attitude of senior secondary school students towards ICT, data were subjected to ANOVA (2x2x2) factorial study with a randomized group design. In this section, the independent variables i.e. Gender, Socio-economic status and Academic performance were coded as A, B, C respectively and were varied into two ways as: Male (A₁) & Female (A₂); High SES (B₁) & Low SES (B₂); High (C₁) & Low (C₂). The summary of ANOVA (2x2x2) has been presented in the Table-1 which is analyzed in the interaction effects of independent variables i.e. gender, socio-economic status and academic performance on attitude of senior secondary school students towards ICT.”

Table-1 “Summary of Three Way ANOVA (2×2×2 Factorial Design) for attitude of senior secondary school students towards ICT with respect to their Gender, Socio-economic Status and Academic Performance”

Dependent Variable: Attitude towards ICT					
Source of Variance	Type III Sum of Squares	df	Mean Squares	F-ratios	Sig.
Corrected Model	239811.568	7	34258.795	24.117	.000
Intercept	3370065.699	1	3370065.699	2372.438	.000
Interaction of Gender x Socio-economic Status x Academic performance (AxBxC)	41607.607	1	41607.607	29.291	.000
Error	769915.103	542	1420.508		
Total	4472521.000	550			
Corrected Total	1009726.671	549			

“An assessment of the Table-1 indicates that the F-ratio (29.291) for the interaction between gender, socio-economic status & academic performance with respect to attitude of senior secondary school student towards ICT is significant at 0.01 level which leads to the inference that gender, socio-economic status and academic performance collectively have a significant effect on attitude of senior secondary school student towards usage of ICT tools. Therefore, H_{01} stands rejected. Therefore, it can be concluded that there is significant interaction effect of gender, socio-economic status and academic performance on attitude of senior secondary school student towards usage of ICT tools. It is further subjected to t-test computation to find out the significant difference between mean scores of attitude towards usage of ICT tools of different groups for Gender, Socio-economic status and Academic performance. The results have been shown in the Table-2. The mean scores for attitude of senior secondary school student towards usage of ICT tools of different groups for Gender, Socio-economic status and Academic performance have been also presented in the form of Fig. 1”.

Table-2 “t’-values for Mean Scores of attitude of senior secondary school student towards ICT for Different Groups of Gender, Socio-economic status and Academic performance (A×B×C)”

Sr. No.	Groups	N		Mean		S.D.		t’-values
1	A ₁ B ₁ C ₁ vs A ₂ B ₂ C ₂	56	58	69.08	80.62	38.38	36.33	1.64(NS)
2	A ₁ B ₁ C ₂ vs A ₂ B ₂ C ₁	58	55	73.20	86.16	39.85	38.28	1.76(NS)
3	A ₁ B ₂ C ₂ vs A ₂ B ₁ C ₁	88	78	48.34	122.34	33.38	38.40	13.19**
4	A ₁ B ₂ C ₁ vs A ₂ B ₁ C ₂	75	82	77.46	79.31	36.86	40.49	0.299(NS)
5	A ₁ B ₁ C ₁ vs A ₁ B ₁ C ₂	56	58	69.08	73.20	38.38	39.85	0.563(NS)
6	A ₁ B ₁ C ₁ vs A ₁ B ₂ C ₁	56	75	69.08	77.46	38.38	36.86	1.25(NS)
7	A ₁ B ₁ C ₁ vs A ₁ B ₂ C ₂	56	88	69.08	48.34	38.38	33.38	3.32**
8	A ₁ B ₁ C ₂ vs A ₁ B ₂ C ₁	58	75	73.20	77.46	39.85	36.86	0.632(NS)
9	A ₁ B ₁ C ₂ vs A ₁ B ₂ C ₂	58	88	73.20	48.34	39.85	33.38	3.93**
10	A ₂ B ₂ C ₂ vs A ₂ B ₂ C ₁	58	55	80.62	86.16	36.33	38.28	0.789(NS)
11	A ₂ B ₂ C ₂ vs A ₂ B ₁ C ₂	58	82	80.62	79.31	36.33	40.49	0.200(NS)
12	A ₂ B ₂ C ₂ vs A ₂ B ₁ C ₁	58	78	80.62	122.34	36.33	38.40	6.40**
13	A ₂ B ₂ C ₁ vs A ₂ B ₁ C ₂	55	82	86.16	79.31	38.28	40.49	1.00 (NS)
14	A ₂ B ₂ C ₁ vs A ₂ B ₁ C ₁	55	78	86.16	122.34	38.28	38.40	5.36**

15	A₁B₁C₁ vs A₂B₁C₁	56	78	69.08	122.34	38.38	38.40	7.92**
16	A₁B₁C₁ vs A₂B₁C₂	56	82	69.08	79.31	38.38	40.49	1.50 (NS)
17	A₁B₁C₁ vs A₂B₂C₁	56	55	69.08	86.16	38.38	38.28	2.34*
18	A₁B₁C₂ vs A₂B₁C₁	58	78	73.20	122.34	39.85	38.40	7.23**
19	A₁B₁C₂ vs A₂B₁C₂	58	82	73.20	79.31	39.85	40.49	0.888(NS)
20	A₁B₁C₂ vs A₂B₂C₂	58	58	73.20	80.62	39.85	36.33	1.04 (NS)
21	A₁B₂C₁ vs A₁B₂C₂	75	88	77.46	48.34	36.86	33.38	5.25**
22	A₁B₂C₁ vs A₂B₁C₁	75	78	77.46	122.34	36.86	38.40	7.38**
23	A₁B₂C₁ vs A₂B₂C₁	75	55	77.46	86.16	36.86	38.28	1.30 (NS)
24	A₁B₂C₁ vs A₂B₂C₂	75	58	77.46	80.62	36.86	36.33	0.494 (NS)
25	A₁B₂C₂ vs A₂B₁C₂	88	82	48.34	79.31	33.38	40.49	5.42**
26	A₁B₂C₂ vs A₂B₂C₁	88	55	48.34	86.16	33.38	38.28	6.04**
27	A₁B₂C₂ vs A₂B₂C₂	88	58	48.34	80.62	33.38	36.33	5.14**
28	A₂B₁C₁ vs A₂B₁C₂	78	82	122.34	79.31	38.40	40.49	6.90**

*** Significant at 0.01 level * Significant at 0.05 level NS= Not Significant"

A₁ = Gender; B₁ = High Socio-economic status;
C₁ = High Academic performance
A₂ = Gender; B₂ = Low Socio-economic status;
C₂ = Low Academic performance

“Table-2 indicates that t-values 1.64, 1.76, 0.299, 0.563, 1.25, 0.632, 0.789, 0.200, 1.00, 1.50, 0.888, 1.04, 1.30 and 0.494 for the groups $A_1B_1C_1$ vs $A_2B_2C_2$; $A_1B_1C_2$ vs $A_2B_2C_1$; $A_1B_2C_1$ vs $A_2B_1C_2$; $A_1B_1C_1$ vs $A_1B_1C_2$; $A_1B_1C_1$ vs $A_1B_2C_1$; $A_1B_1C_2$ vs $A_1B_2C_1$; $A_2B_2C_2$ vs $A_2B_2C_1$; $A_2B_2C_2$ vs $A_2B_1C_2$; $A_2B_2C_1$ vs $A_2B_1C_2$; $A_1B_1C_1$ vs $A_2B_1C_2$; $A_1B_1C_2$ vs $A_2B_1C_2$; $A_1B_1C_2$ vs $A_2B_2C_2$; $A_1B_2C_1$ vs $A_2B_2C_1$; $A_1B_2C_1$ vs $A_2B_2C_2$ respectively are not significant at 0.05 level leading to the inference which means that these groups did not differ significantly with each other in relation to their academic performance.”

Table-2 demonstrates that t-value (13.19) for male pupils having low socio-economic status along with lower academic performance ($A_1B_2C_2$) and female students having high socio-economic status along with higher academic performance ($A_2B_1C_1$) is significant at 0.01 level. Observation of average scores indicated that male students having low socio-economic status along with lower academic performance (48.34) have unfavourable attitude towards ICT than female students having high socio-economic status along with higher academic performance (122.34). The t-value (3.32) for male students having high socio-economic status along with higher academic performance ($A_1B_1C_1$) and male students having low socio-economic status along with lower academic performance ($A_1B_2C_2$) is significant at 0.01 level. Average scores cleared that male students having high socio-economic status along with higher academic performance (69.08) have favourable attitude towards ICT as compare to male students having low socio-economic status along with lower academic performance (48.34). Similarly, the t-value (3.93) for male students having high socio-economic status along with lower academic performance ($A_1B_1C_2$) and male students having low socio-economic status along with lower academic performance ($A_1B_2C_2$) is significant at 0.01 level. Average scores inferred that male students having high socio-economic status along with lower academic performance (73.20) possess favourable attitude towards ICT than male students having low socio-economic status along with lower academic performance (48.34).

The t-value (6.40) for female pupils having low SES along with lower academic performance ($A_2B_2C_2$) and female pupils having high SES along with higher academic performance ($A_2B_1C_1$) is significant at 0.01 level. Average scores demonstrated that female students having low SES along with lower academic performance (80.62) have unfavourable attitude towards ICT than female students having high SES along with higher academic performance (122.34). The t-value (5.36) for female students having low SES along with higher academic performance ($A_2B_2C_1$) and female students having high SES along with higher academic performance ($A_2B_1C_1$) is significant at 0.01 level. Average scores highlighted that

female students having low SES along with higher academic performance (86.16) have unfavourable attitude towards than female students having high SES along with higher academic performance (122.34). Again, the t-value (7.92) for male students having high SES along with higher academic performance ($A_1B_1C_1$) and female students having high SES along with higher academic performance ($A_2B_1C_1$) is significant at 0.01 level. Average scores inferred that male pupils having high SES along with higher academic performance (69.08) shows unfavourable attitude towards ICT as compare to female students having high SES along with higher academic performance (122.34).

The t-value (2.34) for male students having high SES along with higher academic performance ($A_1B_1C_1$) and female students having low SES along with higher academic performance ($A_2B_2C_1$) is significant at 0.05 level. Average scores inferred that female students having low SES along with higher academic performance (86.16) have favourable attitude towards ICT than male students having high socio-economic status along with higher academic performance (69.08). The t-value (7.23) for male students having high SES along with lower academic performance ($A_1B_1C_2$) and female students having high SES along with higher academic performance ($A_2B_1C_1$) is significant at 0.01 level. Average scores highlighted that male students having high socio-economic status along with lower academic performance (73.20) contains unfavourable attitude towards ICT as compare to female students having high socio-economic status along with higher academic performance (122.34). The t-value (5.25) for male students having low socio-economic status along with higher academic performance ($A_1B_2C_1$) and male students having low socio-economic status along with lower academic performance ($A_1B_2C_2$) is significant at 0.01 level. Average scores demonstrated that male students having low socio-economic status along with higher academic performance (77.46) have favourable attitude towards ICT than male students having low socio-economic status along with lower academic performance (48.34).

The t-value (7.38) for male students having low SES along with higher academic performance ($A_1B_2C_1$) and female students having high SES along with higher academic performance ($A_2B_1C_1$) is significant at 0.01 level. Average scores cleared that female pupils having high SES along with higher academic performance (122.34) have favourable attitude towards ICT than male students having low socio-economic status along with higher academic performance (77.46). The t-value (5.42) for male students having low socio-economic status along with lower academic performance ($A_1B_2C_2$) and female students having high socio-economic status along with lower academic performance ($A_2B_1C_2$) is significant at 0.01 level. Average scores highlighted that male

students having low socio-economic status along with lower academic performance (48.34) contains unfavourable attitude towards ICT than female students having high socio-economic status along with lower academic performance (79.31).

The t-value (6.04) for male students having low socio-economic status along with lower academic performance ($A_1B_2C_2$) and female students having low socio-economic status along with higher academic performance ($A_2B_2C_1$) is significant at 0.01 level. Average scores cleared that male students having low socio-economic status along with lower academic performance (48.34) have unfavourable attitude towards ICT than female students having low socio-economic status along with higher academic performance (86.16). Again, the t-value (5.14) for male students having low socio-economic status along with lower academic performance ($A_1B_2C_2$) and female students having low socio-economic status along with lower academic performance ($A_2B_2C_2$) is significant at 0.01 level. While comparing average scores, it can be demonstrated that female pupils having low socio-economic status along with lower academic performance (80.62) contains favourable attitude towards ICT as compare to male students having low socio-economic status along with lower academic performance (48.34). Lastly, the t-value (6.90) for female pupils having high SES along with higher academic performance ($A_2B_1C_1$) and female students having high SES along with lower academic performance ($A_2B_1C_2$) is significant at 0.01 level. Average scores cleared that female pupils having high socio-economic status along with higher academic performance (122.34) possess favourable attitude towards ICT than female students having high SES along with lower academic performance ($A_2B_1C_2$).

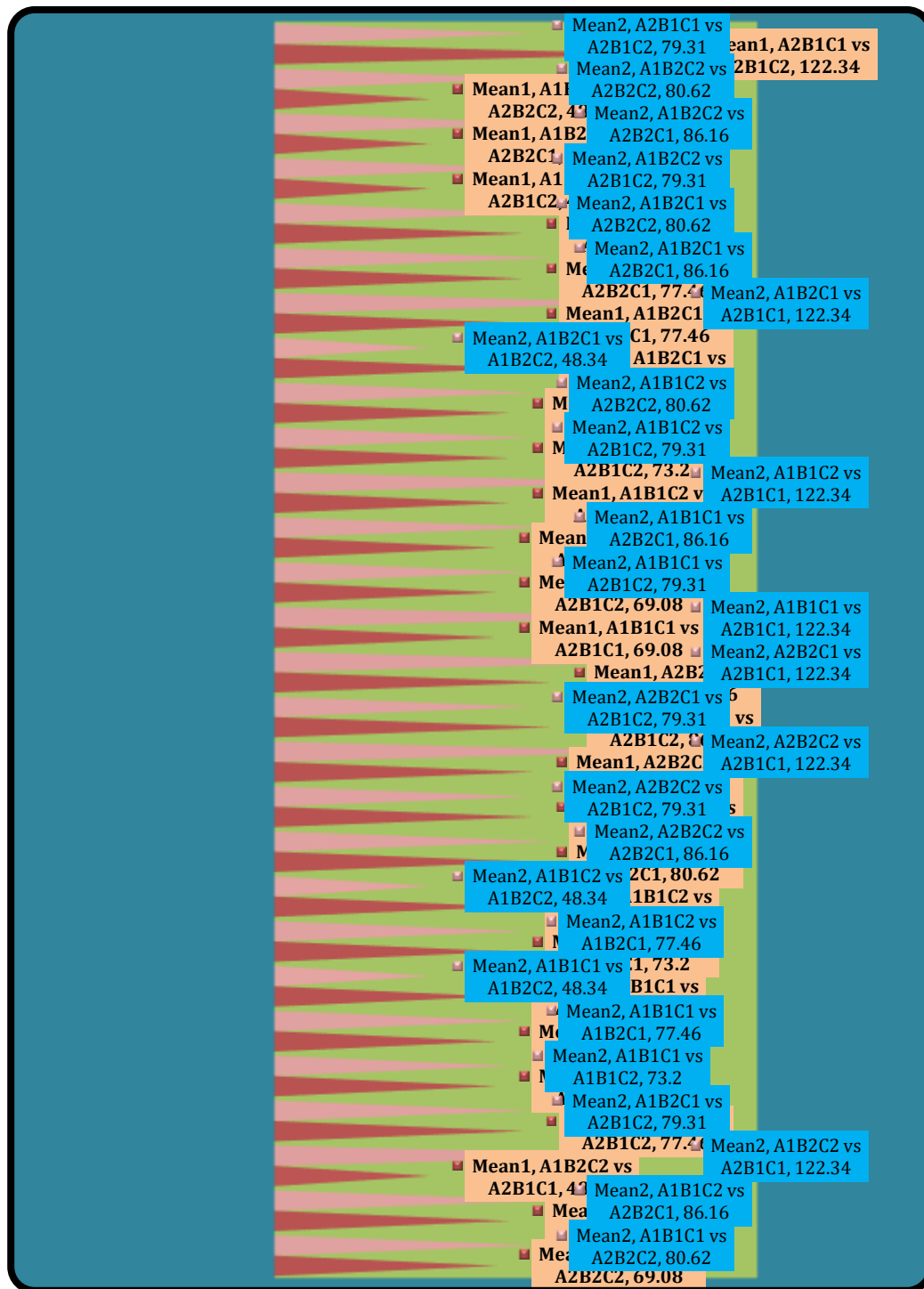


Fig. 1: Mean Scores for Interaction Effect of Gender, Socio-economic status and Academic performance (AxBxC) on Attitude towards ICT of Sr. Sec. School Students

CONCLUSION

ICT in education refers to its capacity to improve students' educational experiences. Teachers may design dynamic and captivating classes that hold students' interest and encourage active engagement by integrating technology into the classroom. Students and teachers can collaborate and communicate more easily thanks to ICT. ICT-enabled education will ultimately lead to education's constitutionalization. Teachers should update their lesson plans or create technology-appropriate lesson plans and attempt to incorporate technology into the curriculum in order to improve the quality and quantity of secondary education. ICT plays a critical role in expanding the student body in higher secondary education. Proficiency in digital literacy is crucial for pupils' future success in an increasingly digital environment. By giving students the chance to use digital tools, assess online content critically & engage in responsible digital citizenship, ICT in the classroom aids in the development of these abilities. ICT is transforming education through empowering educators and learners, fostering global connectivity, and reimagining the concept of learning. It is necessary to address issues like the digital divide and infrastructure constraints. ICT integration in higher secondary education changes how teachers and students learn, advances higher setup skills like time and location association, and makes complex real-world problems easier to understand.

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