Examining University Students' Attitude towards e-Learning and Their Academic Achievement during COVID-19

G. S. Prakasha, R. Sangeetha, S. M. Almeida, and A. Chellasamy

***Abstract*—Higher education around the world has moved to online teaching due to COVID-19 pandemic. Students in higher education are compelled to attend online classes and adopt e-learning mode. There is not much evidence on training the students to adopt e-learning and remote learning. However, do they have a positive attitude towards e-learning and has it affected their academic performance? Present study administered an e-learning attitude scale to 840 students of a reputed University to examine whether they have positive or avoidance attitude to e-learning and also analysed e-learning attitude across students demographic characteristics. Study revealed a slight positive correlation between e-learning attitude and academic achievement of postgraduate students and not for undergraduate students. Girls' excelled in their achievement and have a more positive e-learning attitude than boys have. Boys showed avoidance e-learning attitude. However, Socio Economic Status (SES) did not affect students' e-learning attitude but influenced their academic achievement. Study concludes that stakeholders must create more opportunities to develop a positive attitude towards e-learning as future education is likely to be technology integrated.**

***Index Terms*—Academic achievement, attitude, e-learning, university.**

I. Introduction

The pandemic COVID-19 transformed all industries, especially educational institutions; to shift from face to face campus based class environments to remote and online learning. As a solution to COVID-19 and for learning continuity, Universities and institutions across the globe have adopted online learning [1]. Nevertheless, distance learning or online learning has been proactive since the introduction of the internet into the field of computers. The advent of the internet has transformed various fields like learning into e-learning, education into online education, commerce into e-commerce, business into e-business and so on and so forth. However, one cannot deny the fact that the success of any information system is because of the attitude, approach and adoption of the system by the stakeholders [2]. It's a global shock that the pandemic Covid 19 has brought in by "campus off" but "learning on " mode to the education sectors [3]. Nevertheless, students' attitude and emotions towards the sudden closure of schools and educational institution is a matter of concern. Hence, Mirahmadizadeh *et al*. (2020) explored the motivation and attitude of students towards e-learning and found that students show enthusiasm towards e-learning despite the fact that e-learning is an imposed situation due to the outbreak of coronavirus [4]. Chiu (2021) investigated the effect of perceived psychological needs in self-determination theory (SDT) on student engagement among grade 8 and 9 students [5]. The study revealed that digital support strategies are the significant factor in satisfying students' need. However, the pandemic demanded a shift in education from brick and mortar to online, one cannot deny the challenges it posed towards the institution, faculty, and students. This online education may increase the digital divide among students and generational divide among faculty where older generations prefer traditional teaching and younger generations being tech savvy [6]. Universities managed hasty shift by giving technical training to its faculty and students [7]. Study conducted by professors from Kenya during pre Covid time revealed that investment in e-learning infrastructure, e-learning content development, capacity building, attitude change by both professors and students along with e-learning awareness program are pre requisite to make the e-learning successful [8]. The report by Morrison and Carroll of Center for Strategic and International Studies (CSIS) states, "Pandemics change history by transforming populations, states, societies, economies, norms, and government structure. Likewise COVID 19 marks the start of an era of continuous rapid change". They presented that there will be a revolution in various spheres of the economy namely population, resources, technology, information, economics, security as well as governance. Students' attitude towards e-learning depends on how they are engaged in the session considering three elements proposed in self-determination theory namely autonomy, competence, and relatedness. Hermawan (2021) mentioned that though institutions and other stakeholders in the education sector accepted the shift towards e-learning [9]. It requires improvements in infrastructure, comfort level of faculty, and absorption of knowledge by students. Having identified the challenges in online education it is important to know the effective ways in which the classes handled. Pandey *et al*. (2021) scrutinized the various online platforms, study materials, techniques, as well as technologies available for effective teaching [10]. They have also explored the various online modes to conduct online examination avoiding cheating by the students. The scrutiny revealed that students prefer content that is more of multimedia. Having discussed the status of online teaching in Higher education around the

Manuscript received January 21, 2022; revised May 5, 2022.

G. S. Prakasha is with the School of Education, Christ University, Central campus, Bangalore, India (e-mail: prakasha.gs@christuniversity.in).

R. Sangeetha and S. M. Almeida are with the Christ University, Central campus, Bangalore, India (e-mail: sangeetha.r@christuniversity.in, shaeril.michael.almeida@christuniversity.in).

A. Chellasamy is with the Christ University, BGR campus, Bangalore, India (e-mail: aarthy.c@christuniversity.in).

doi: 10.18178/ijiet.2022.12.10.1720

world due to COVID-19 pandemic and students' adoption towards e-learning, there is a need to explore whether students have a positive attitude towards e-learning and has it affected their academic performance? Accordingly, the study attempted to explore the students' attitude towards online education and their academic performance.

II. Review of Literature

A. E-Learning Background

Technological advancement has brought in many transformations to various industries especially the education sector. One among them is the online education or e-learning which is mostly used to make the education boundless. E-learning gives opportunity for students irrespective of geographic boundaries [11] by providing a varied scope of learning through computer based, web based, virtual, and digital collaboration [12]. E Learning consists of working online or offline, in a synchronous or an asynchronous mode [13]. E-Learning 1.0 was the initial phase where online learning mainly consisted of more of a traditional and mono directional way of learning. Here course instructions were developed and made available. E-learning 2.0 depicted a more liberated online classroom with a wide usage of social tools like wiki, podcast, and blogs. This was more of a collaborative way of learning and involved creation of more dynamic content. The current education system is using E-Learning 3.0, where there is a wide usage of cloud computing, massive data storage capacity, very high screen resolutions, 3D touch interface, and AI. E-Learning 3.0 is on the concept of anytime, anywhere, and anyhow. Personalization is also a key factor here. A study conducted in UK focused on the challenges and factors that need focus to make a student not only as globally connected but also as a global citizen with a holistic development [14]. One cannot deny the merits of e-learning such as wider access, speedy communication, and academic collaboration [15]. A method of e-learning which is gaining popularity now is linking the massive open online courses with social media tools when the population is huge [16]. Tracking of the effectiveness of the massive open online courses becomes easy by analysing the tweets and comments made by the students. Social media mining and e-learning when used effectively can help the course designer in tracking the success or failure of the MOOC and also it can help in catching the public sentiments and influencers record in the MOOC learning. This can enable the betterment of the overall program.

Adaptive Educational Hypermedia (AEH) is an important term associated with e-learning, AEH means a practice to provide the online learners with different learning strategies and resources which suit an individual learning style. Every individual has a unique learning style and the same comes into picture with e-learning also [17]. Özyurt and Özyurt (2015) conducted a systematic literature review on adaptive educational hypermedia and learning styles of online learners and concluded that AEH has impacted and also does not show much variation when it comes to academic achievements, learning outputs, and satisfaction levels of the online learners [18]. Therefore, the bottom line is that adaptive educational hypermedia plays an important role at times in e-learning but at the same time does not contribute much. In the present study, while students attempt to learn online whether AEH supports their individual learning and thereby influences their academic achievement.

B. Covid-19 and the Demand for e-Learning

Covid-19 pandemic led to suspension of campus classes by academic institutes across the globe where 1.2 billion children in 186 countries [19] affected and institutes were in immediate transition to online teaching and learning to implement the required social distancing protocol. Crisis makes society to refresh itself in whatever way it could be and the higher educational institutes follow a new normal mechanism by digitally transforming its education and training [20]. Researchers from Hungary [21] have highlighted that the digital transformation in the education sector during COVID situation has brought in a new perspective about online education. Students had accepted the online mode of teaching though few had technical issues, which is the biggest challenge in the mode of e-learning [22]. A key factor which contributes to the success of e-learning is e-learning readiness. Without being ready even the best e-learning program can be a mere waste. Rohayani (2015) found that the readiness factors which are associated with e-learning are knowledge, skills, experience, attitude, technology, human resources, financial capability, organizational policy, and organizational and psychological barriers [23]. The cost, effort, and time spent on e-learning can only be successful if the readiness of the teacher and the student is present at a higher grade. In addition, it should be noted here that the readiness varies from institution to institution. Therefore, the assessment of current situation of the institution is necessary. Mafenya (2013) in his study says that e-readiness plays a very important role as it permits the policy makers to make appropriate policy and development plans with reference to e-learning [24]. ZHU *et al*. (2013) have confirmed in their study that flexibility, convenience, and easy access to the course are the success factors of e-learning which set a positive attitude towards online education [25].

C. Technology Acceptance Model (TAM) Effect on e-Learning

Odeshi and Egbe (2014) studied the relationship between attitude and e-learning using the TAM model, which indicated that perceived ease of use has a positive attitude among students in accepting e-learning and students find it easy in accessing information and enhancing learning [26]. Another study conducted by Ullah *et al*. (2017) to examine the attitudes of undergraduate students towards technology acceptance model specific to online learning in Peshawar, India [27]. It was found that students' interest in computers as well as the usefulness of computers to students has not significantly contributed to ease in using those technologies for online learning. Ho *et al*. (2020) used the technology acceptance model to investigate the major factors that affect students' acceptance of e-learning during the Covid-19 period [28]. Study found that, computer self-efficacy has a positive influence on perceived ease of use. System Interactivity also has a positive relationship with perceived ease of use.

However, study traced that perceived ease of use does not have a significant impact on the students' attitude. Interestingly social factors have a direct effect on the students' attitude. Singh *et al*. (2020) explored the adoption, intention, and effectiveness of digital collaboration platform facilitated by the higher educational institutions situated at Maharashtra, India using TAM [29]. Based on their scrutiny it was found that interactivity, cost-effectiveness, and the core TAM constructs form a positive attitude towards the usage of digital collaboration platform and intention to adopt e-learning in the near future. In the present study, as we intend to understand the students attitude towards e-learning, as per TAM, students attitude towards e-learning does depends on perceived usefulness of the technology tools used and perceived ease of use.

D. Attitude of the Students towards e-Learning

Covid 19 transformed the education sector by making the entire process technology driven. This definitely opened up various avenues to the students to explore their learning opportunities from professors and institutions across the globe. Hence, researchers explore the existing literature to understand the teachers as well as students' attitude to accept and adapt the same. Attitude is a feeling or way of thinking that affects a person's behaviour. Khan *et al*. (2020) mentioned in their research that students of the National Capital Territory of India have a very positive approach towards e-learning [30]. Sustainability in e-learning can be achieved through the support system provided by the institution as well as through effective delivery. Researchers from Pakistan joined with a researcher from Malaysia to understand the factors that affect the students' satisfaction and brand image of the universities in a digital learning environment. Findings reveal that Information and Communication Technology (ICT), e-service quality, and e-information quality are having a positive impact on students' e-learning. This has facilitated the development of a better brand image of universities through e-word of mouth by the satisfied e-learning student [31]. Unger and Meiran (2020) researched the attitude of students towards online learning during the first few weeks of online learning implementation [32]. In this survey, students expressed their anxiety towards online learning, disappointment about missing graduation ceremony, and felt the differences in standards of learning between campus learning and online learning. However, students expressed improvement in their learning and adaptability during follow up. Kar *et al*. (2014) studied the attitude of university students towards e-learning specific to West Bengal covering four universities namely Sidho-Kanho-Bishra University, Jadavpur University, Visva-Bharati, and Gourbanga University [33]. They have identified that students have a high attitude towards e learning also there is no difference between the samples in terms of demographic profile. While investigating the attitude of the students towards e- learning adoption it is important to understand the intention to adopt along with the effectiveness of digital collaboration platforms for online learning in India.

E. E–Learning Attitude of Students Based on Gender and Age

A study in Sweden on students' perceptions of e-learning in university education revealed that, male students, students with computer science background, and students having positive attitude towards e-learning did not like e-learning on campus [34].

Dečman (2015) conducted a research in light of unified theory of acceptance and use of technology keeping in mind the previous education and gender differences [35]. The performance expectancy and social influence play a very important role in the intention to the usage of technology and young people are more comfortable to use the technology, which adds to their performance. This study found that previous education and gender has no significant influence on the e-learning of a student.

F. Effectiveness of the e-Learning

Romania based researchers Coman *et al*. (2020) explored the effectiveness of the mode in which universities in their area reacted to the pandemic by adopting online teaching and learning [36]. A study conducted in Nepal explored the various factors that contribute to improving the effectiveness of the online mode of classes. They found that three factors namely infrastructure, student, and teacher specific factors or perception play a major role in the effectiveness of online modes of teaching and learning [37]. Alam et al. (2021) attempted to develop a model with bi-dimensional features. The first one is to evaluate the success of the e-learning service and the second aspect assesses the impact of e-learning services on learning and academic performance of students. Mukhametshin *et al*. (2021) examined the various aspects of the remote leaning system as an effective tool to manage the current demand posed by the pandemic towards educational institutions [38]. The results indicated the negative impressions of the students due to unstable internet connection along with the difficulty faced by the students while preparing for the assignment given by the teachers without much explanation. Alqahtani and Rajkhan (2020) identified the critical success factors for e-learning during the pandemic [39]. They found that management of technology, management support, and increased awareness among students about e-learning platforms along with high-level information technology implementation by the institutions and instructors were found to be critical factors contributing to the success of e learning adoption. Nichols (2020) in his research presented the perception of online students towards the support services provided by the institution to enhance learning experiences [40]. The respondents mentioned that along with library services, technical support, and writing service institutions should also have to take effort to supplement advising, orientation, peer to peer, and faculty discussion to facilitate better learning experiences. Personalized e-learning is an experience where the students are provided with a special experience of e-learning which is tailor made according to the individual students need and style of learning [41]. On one hand the faculty who are very sound technically can do the personalization of the e-learning very easily but on the other hand the faculty who are not strong technically will find it difficult to Personalize e-learning for the students. The faculty who are trained can provide a better and a customized e-learning experience to

the learners. Hence, the educational institutions should take up the task of training the faculty.

G. Context of the Present Study

Having discussed the existing researches on e-learning, need, technology aspects, readiness and attitude of the students and supportive measures by the institutions it was identified that the attitude of the students play a major role in bringing success to the online education. Hence, the present study is intended to understand the students' attitude towards e-learning and its effect on their academic achievement during pandemic. Researchers conducted present study in a reputed Indian University, which hosts 20,000 plus students from diverse cultural backgrounds across the country. Due to the pandemic, universities switched to online instruction and professors to work from home. University professors knew very little about their freshers' because of online instructional mode. University organised quality improvement programme for professors on online teaching skills. Universities are in a position to explain to the students and staff that this e-learning environment is an emergency care due to COVID, which may give better perception and picture about the e-learning environment to all the stakeholders, which elevates their confidence level [42]. However, there was no student training about adapting to online learning. Students successfully completed their first semester but professors had their own apprehension about students' attitude towards e-learning. Since the student strength is huge in the University considered for the study, the researchers felt to carry out the study for the benefit of staff, management, and students.

Technology acceptance model (TAM) theory guided the present study. In the study, both teachers and students have their own idea about perceived usefulness of any technology platforms and tools used while teaching and learning within their course. They also had their own ideas in their perceived ease-of-use [43]. Thus, present study intended to study its effect in terms of attitude, academic performance, and other demographic variables. The Adaptive educational hypermedia (AEH) systems are a learning model with adaptive and personalized feature [44]. In the present study, AEH system takes care of the way teachers and students uses the online-tools to teaching and learning respectively. Thus, affecting the attitude and academic performance, which present study, wants to understand.

III. Methods

General attitude scale towards e-learning constructed by Haznedar and Baran (2012) is used for the present study [45]. A pilot study on a sample of 100 students established the reliability of the scale. Study found Cronbach alpha value of 0.698 indicating high reliability of the scale [46]. Table I below presents the results obtained by Cronbach alpha internal consistency test.

TABLE I. Scale Reliability

Cronbach's Alpha	N of Items
0.698	20

Study employed simple random sampling method, circulated a general attitude scale towards e-learning (Haznedar & Baran, 2012) along with demographic details on a google form to 1000 students studying in a reputed university in India and received 840 responses. Among them 379 are boys and 461 are girls. Out of 840 participants, 759 are pursuing various undergraduate programmes and 81 are pursuing postgraduate programmes. The demographic data included age, gender, education level, socio economic status (SES), and academic achievement. Researchers categorised SES based on the family income and included the participants' percentage in the end semester examination as academic achievement. Researchers collected these demographic details as per the research questions raised in the present study. The researchers cleaned the data obtained and then fed it into SPSS version 24 to analyse the data [47]. The general e-learning attitude scale has two parts, tendency to e-learning and avoidance to e-learning (refer Table II) with a 5 point Likert scale varying from strongly disagree to strongly agree.

TABLE II: General Attitude Scale towards e-Learning (GASTE)

Tendency to e-learning
I follow the developments related to e-learning
E-learning facilitates learning
E-learning should be more widespread
E-learning is fun
I am pleased with studying at my own pace through E-learning
E-learning attracts my attention
E-learning promotes success
E-learning increases the productivity of the learner
E-learning increases the motivation to learn
I would like to learn in an e-learning environment
Avoidance to e-learning
E-learning course does not fit my way of working
Lack of face-to-face interaction in E-learning bothers me
I do not like learning in e-learning environments
I do not think e-learning will be useful
Assessment in E-learning cannot be done properly
I think I will encounter a lot of questions when I take courses through e-learning
I do not think I can get enough teacher support in e-learning
E-learning is unnecessary
E-learning prevents socialization
The idea of getting education through E-learning makes me feel bad

TABLE III: Independent Sample t-Test between General e-Learning Attitude and Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Difference	
									Lower	Upper
General e-learning attitude	Equal variances assumed	1.802	.180	-2.008	838	.045	-1.313	.654	-2.597	-.029
	Equal variances not assumed			-1.981	756.6	.048	-1.313	.663	-2.614	-.012

IV. Results

The study employed Pearson correlation test to find the relationship between general attitude towards e-learning and academic achievement of the UG and PG students. The correlation test revealed no correlation ($r \approx 0$) between academic achievement and attitude towards e-learning among UG students. In case of PG students, study observed a positive r-value ($r = 0.159$, $p > 0.5$) between academic achievement and attitude towards e-learning and is not statistically significant. However, Pearson correlation between tendency towards e-learning and academic achievement of the PG students showed a weak positive correlation ($r = 0.243$, $p = 0.029$).

Every year girls represent 70% of the student population in the University. Therefore testing against gender gains importance in the present context. Study employed an independent sample t-test to find the difference in attitude towards e-learning among boys and girls. Table III below presents the result of the t-test.

From Table III, it is clear that there is a statistically significant difference between the boys and girls general e-learning attitude t (838) = -2.008, $p < 0.05$. Girls' (M = 66.46, SD = 8.83) general e-learning attitude is higher than the boys' are (M = 65.14, SD = 10.11).

In order to understand the tendency to e-learning among boys and girls, researchers conducted another independent sample t-test and the Table IV below presents its result.

TABLE IV: Independent Sample t-Test between Tendency towards e-Learning and Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Difference	
									Lower	Upper
Tendency towards e-learning	Equal variances assumed	14.530	.000	-4.947	838	.000	-3.251	.657	-4.541	-1.961
	Equal variances not assumed			-4.870	744.435	.000	-3.251	.668	-4.562	-1.941

From Table IV, it is clear that there is a statistically significant difference between the boys and girls tendency to e-learning t (744) = -4.870, $p < 0.05$. Girls' (M = 33.56, SD = 8.75) tendency to e-learning is higher than the boys are (M = 33.56, SD = 10.29).

Similarly, in order to understand the avoidance of e-learning among boys and girls, researchers conducted yet another independent sample t-test and the Table V below presents its result.

From Table V, it is clear that, there is a statistically significant difference between the boys and girls avoidance to e-learning t (755) = 3.289, $p < 0.05$. Girls' (M = 32.90, SD = 7.83) avoidance to e-learning is lower than the boys are (M = 34.84, SD = 9.00).

In India, usually girls perform better than boys do in their academic achievement at primary, secondary, and tertiary level. In the present study, girls have a tendency towards e-learning when instruction was online during a pandemic. Therefore measuring their academic achievement gains importance. Hence, study employed an independent sample t-test to find the difference in academic achievement among boys and girls. Table VI below presents the result of the t-test.

From Table VI, it is clear that there is a statistically significant difference between the boys and girls academic achievement t (837) = -4.074, $p < 0.05$. Girls' (M = 73.61, SD = 9.17) academic achievement is higher than the boys are (M = 70.91, SD = 10.03).

University has students from various socio economic backgrounds being located in a developing country like India. Though instructions went online due to the pandemic, not all students could afford personal computers and some will use their smartphones to attend online classes. Being first years, they lack andragogic acquaintance with University education and had varied attitudes towards e-learning. Therefore, the present study investigated the effect of their socio economic background on academic achievement and on their attitude towards e-learning through one way ANOVA. Table VII below presents the results of the ANOVA test.

Table VII reveals that, there is a significant effect of SES on students' academic achievement F (2, 836) = 11.338, $p < 0.05$ and SES has not shown any significant effect on their attitude towards e-learning F (2, 837) = 0.590, $p > 0.05$. Researchers conducted Tukey post-hoc test to understand the interaction effect of levels of SES on academic achievement refer Table VIII below for its result.

TABLE V: Independent Sample t-Test between Avoidance to e-Learning and Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Difference	
									Lower	Upper
Avoidance attitude	Equal variances assumed	9.589	.002	3.334	838	.001	1.938	.581	.797	3.080
	Equal variances not assumed			3.289	754.617	.001	1.938	.589	.781	3.095

TABLE VI: INDEPENDENT SAMPLE T-TEST BETWEEN ACADEMIC ACHIEVEMENT AND GENDER

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Difference	
									Lower	Upper
AA	Equal variances assumed	0.860	0.354	-4.074	837	0.000	-2.704	0.664	-4.008	-1.401
	Equal variances not assumed			-4.039	775.162	0.000	-2.704	0.670	-4.019	-1.390

TABLE VII: ANOVA FOR ACADEMIC ACHIEVEMENT AND E-LEARNING ATTITUDE ACROSS SES

		Sum of Squares	df	Mean Square	F	Sig.
AA	Between Groups	2064.578	2	1032.289	11.338	.000
	Within Groups	76113.733	836	91.045		
	Total	78178.311	838			
General e-learning attitude	Between Groups	105.512	2	52.756	.590	.554
	Within Groups	74817.744	837	89.388		
	Total	74923.256	839			

TABLE VIII: TUKEY POST-HOC TEST FOR ACADEMIC ACHIEVEMENT AND SES

Dependent Variable	(I) SES	(J) SES	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
AA	Low SES	Average SES	-3.157*	.846	.001	-5.14	-1.17
		High SES	-3.533*	.970	.001	-5.81	-1.25
	Average SES	Low SES	3.157*	.846	.001	1.17	5.14
		High SES	-.376	1.153	.943	-3.08	2.33
	High SES	Low SES	3.533*	.970	.001	1.25	5.81
		Average SES	.376	1.153	.943	-2.33	3.08

*. The mean difference is significant at the 0.05 level.

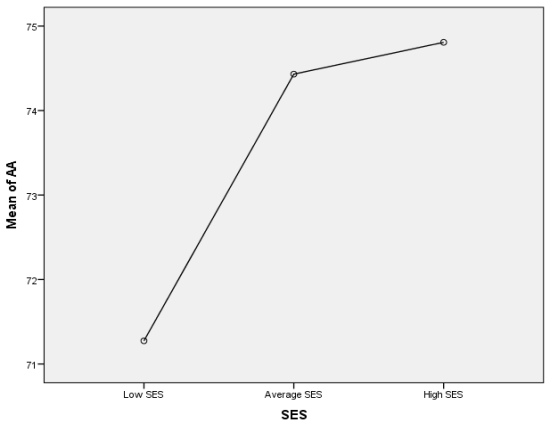

Fig. 1. ANOVA Means plots between academic achievement and SES.

From the results of Table VIII above, Tukey post hoc test revealed that the academic achievement was statistically significantly lowest in students coming from low-SES (M = 71.27, $p < 0.05$) when compared with students from average and high SES. Academic achievement of students from high-SES are statistically significantly higher (M = 74.81, $p < 0.05$) when compared with low SES students. The academic achievement of students coming from average SES are statistically significantly higher than the students from low SES do (74.43, $p < 0.05$). Fig. 1 below presents the means plots of the analysis of variance.

V. DISCUSSION

Remote teaching and learning has become the new normal in higher education during pandemic. Universities and colleges across the globe have invested in online teaching platforms such as Webex, Google meet, Microsoft-teams, Big-blue button, Zoom, etc. Institutions conducted training programmes for their teaching staff to adapt these technologies in no time. However, there is not much evidence of students training to adapt to online learning and the functional knowledge on learning tools. Universities can give training to students with the help of intelligent systems, which can recommend curated courses to students to adapt to the e-learning environment thereby enriching the academic experience [48]. To overcome challenges always having plan B ready or keeping recorded lectures well in advance will avoid last minute hassle [49]. Teachers integrated random teaching learning tools found on the internet to make their classes effective and meaningful. Students admitted during the academic year 2020-21 to various UG and PG programmes of the university in their first year have not seen the campus since they started their classes through e-learning mode. Selected University represents the students across the country with varied culture, language, and socio economic background. Researchers conducted the study after their first semester results and keeping in mind their attitude towards online and e-learning during the semester.

It was found that PG students have a weak positive correlation between their academic achievement and tendency towards e-learning. Whereas no such relationship was found with undergraduate students. UG students are yet in their transition state from pre-university college to University education and never exposed to remote learning

prior to pandemic. PG students out of their maturity, undergraduate experience, and responsibility have shown a positive attitude towards e-learning and thus their academic achievement has been better.

In India, girls usually outperform boys in all levels of education. Its bearing comes from the traditional Indian culture. Culturally girls stay at home most of the time when compared with boys. Lockdowns and remote learning due to pandemic would have influenced their attitude to e-learning and their achievement. In the present study, girls have shown a positive attitude towards e-learning and excelled in their academic achievement than boys. In Indian context, boys in their early adulthood usually like spending their time outdoor and the pandemic has crippled their movement. Nevertheless, remote learning has been a tough experience for them. However, results show that boys are used to video gaming and possess a tech-savvy attitude; their attitude towards remote learning is not positive. The present study revealed an avoidance to e-learning from boys and similar results were observed in the studies of Kayalar [50] and Palloff and Pratt [51].

India being a developing country, people have varied socio economic status. Being a reputed university with huge student strength certainly had students with varied socio economic backgrounds. However, accurate identification of their background has not been possible due to remote learning. The study revealed that students from low socio economic status have lower academic achievement and students with average and higher socio economic status have higher academic achievement. In India, usually people from low socio economic status cannot afford personal computer systems to support their children's education. During covid-19 pandemic, they borrowed smart phones from their parents to access online instructions. Nevertheless, their lack of knowledge on e-learning and lack of digital infrastructure affected their academic performance. Especially when it comes to educational investment, a typical Indian family invests on boy child education than the girl child. Though girls from all economic strata have shown a positive attitude towards e-learning their academic achievement varied based on the SES and other cultural factors.

VI. Conclusion

The present study achieved the intended outcome of the research. It suggests that, all the stakeholders may create more opportunities to develop a positive attitude towards e-learning since future education is more technology based. Students' readiness and characteristics matters for online learning [52]. Unavailability of internet facilities along with students' inhibition towards online learning are the major hurdle for an online learning environment. Hence, policy makers should take initiatives like organizing workshops and seminars for both students and teachers to make the learning environment conducive to the stakeholders (Ullah et al., 2017). Study conducted by Jensen (2015) suggests that faculty must use constructive approach and active learning method for proper student engagement [53]. Faculty may remove barriers related to the usage of technology from the minds of the students' and that will create a positive attitude towards usage of technology. Researchers measured SES in terms of family income and academic achievement in terms of percentage obtained by the students in their semester examination only due to ongoing pandemic situations and thus, these formed the limitations of the present study. There is a need to investigate the available digital infrastructure to the children in Indian families. Government, non-governmental organizations, educational institutions must take measures to support students' needs during situations like this rather than blindly insisting on remote or e-learning. Future researchers can explore student training to adapt to e-learning and remote learning. India being densely populated with youths there is a need to understand the reasons for boys' avoidance attitude to e-learning. It is high time that India must get over with stereotypic attitudes towards girls' education.

Conflict of Interest

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript and approved the same for publication.

Author Contributions

G S Prakasha did data analysis, discussion, and references. R Sangeetha did review of literature and citations, S M Almeida worked on introduction and theoretical framework. A Chellasamy did collect the data and worked on the research gap. However, towards the end all have verified the final manuscript for its clarity.

Acknowledgements

We express our sincere gratitude to the University for allowing us to conduct this study. Our sincere thanks to all the participants for their cooperation during data collection.

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G. S. Prakasha is an assistant professor at School of Education, Christ University, Bangalore, India. He has 20 years of teaching and research experience in the field of Education. His research areas of interest lie in teacher education, teaching-learning pedagogies, assessment and evaluation, educational technology, and higher education.

R. Sangeetha currently working as an associate professor of management, in CHRIST (Deemed to be University), Bengaluru, India. Her research interests and publications are in the fields of banking, stock market and econometrics.

Shaeril Michael Almeida is an associate professor at CHRIST University Bangalore. She has completed her Ph.D. in general management and has a keen interest in research and writing, apart from teaching. Her areas of teaching are motor insurance, strategic management and policy making, and cost accounting.

A. Chellasamy is an engineer turned academician with 7 years of teaching experience in management studies. Her research area includes technology in marketing, consumer behaviour and technology in management. She has published more than 60 papers in internationally reputed journals.