Navigating the Challenges of ICT and Psychological Revamping on Education amidst COVID -19 in India

Hemangi Narayan Narvekar[1]*, Aurobind Ganesh[2]

[1]Clinical Psychologist & PhD (Psychology) Scholar, CHRIST University, Bengaluru, INDIA

[2]Department of Child and Adolescent Psychiatry, NIMHANS, Bangalore, INDIA

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Abstract:

Worldwide educational institutions are putting their best efforts to continue the academic year in COVID – 19 lockdowns through the adoption of ICT. The e-learning being the only medium of instruction and not a supplementary mode of education have created novel concerns in pedagogical field which the present study attempts to look at holistically. The study explored the student's motivation to use ICT as well as the challenges they face in the process of digital learning. The study involved a sample of students from different streams of education who were approached with the questionnaire developed based on Technology Acceptance Model. Results indicated that age and education have a significant association with ease in using ICT. Internet expertise influenced the likelihood of continuing ICT and preference for online classes. A usage gap was observed where ease with using ICT tools had a negative correlation with the likelihood of using ICT for learning. The swift inadvertent move to ICT education is resulting in poor user experience because of barriers such as poor internet connectivity, communication issues, physical infrastructure and language incompetence which is unconducive to learning. Consequently, there is a dire need for advancement in ICT education concerning technological as well as psychological support to help facilitate a smooth process of ICT education during the pandemic.

Key words: digital learning; education; ict; internet expertise; motivation

Introduction:

The world is facing the problem of the novel Corona Virus and in this view, all the educational institutions are closed to break the spread chain of the disease encouraging a complete lockdown. Students across the countries are losing valuable time in terms of their education and learning. It has been impacting the completion of syllabus, academic as well as other competitive and entrance examinations, admission processes, placements and internships. But most importantly it has led to disruption in maintaining the flow of study among students (Burgess & Sievertsen, 2020). Considering the pandemic and social distancing, educational institutes are compelled to utilize Information and Communication Technology (ICT) for ensuring the continuous development of students.

Although ICT has become integral in teaching-learning interaction, not until this pandemic, it gained such prominence. Replacing chalkboards and whiteboards, using a student's smartphone or computer for learning has been the recent change. This swap to digital can be termed as a unique experiment since without the pandemic it would not have been possible to force the educational bodies to transform from physical to virtual education in such a short time. School uniforms are no more compulsory but smartphones are if one has to attend the class. The schools are adapting rapidly communication software like computers, internet and multimedia to transmit, store, share or exchange learning material. Through numerous online learning opportunities which gained popularity in recent times, students are making good use of this lockdown period for skill enhancement (Rana, 2020).

Most of the studies focused on the challenges that students come across when taking online lessons during the lockdown. The common problems found were unstable internet connectivity (Gunawan et al., 2020), lack of digital training (Owusu-Fordjour et al., 2020), technical issues and financial support among others (Almaiah et al., 2020).

However, it is important to note that the success of ICT learning is not based on the physical infrastructure alone but is reliant on the willingness and acceptance of ICT by students as well (Shawai and Almaiah, 2018). Technology Acceptance Model, one of the most widely used model, explains this phenomenon. The attributes which influence acceptance of technology are mainly its perceived usefulness, perceived ease of use, attitude towards it and behavioural intention to use (Davis, 1989). Thus it is important to understand these constructs when commenting about the experience of digital learning.

Though research on factors contributing to successful ICT education is apparent, there is a dearth of studies conducted during the pandemic when ICT is the only medium of instruction for pupils. Priyadarshini & Bhaumik (2020) investigated e- readiness of students and found that most of the students are finding online learning ineffective compared to regular classroom teaching. Various educational institutions are seen implementing customized ICT learning by acknowledging different learning behaviours of the students (Almarzooq et al., 2020 & Tran et al., 2020).

Majority of these studies were conducted during the early period of crisis wherein the learning was temporarily stopped. Researchers discussed the possible effects of continued lockdown on education and problems that might be arising in the process of implementation of online learning but have not studied it empirically. The studies on the views of students undergoing online learning during the pandemic are not fully studied and are still in its infancy stage in developing countries like India. Thus the research gap in terms of assessing the readiness of students for e-learning as well as evaluating the efficiency of the implementation of ICT for education during the COVID-19 contributes to our present research.

Nevertheless, digital learning carries with it the stigma of being not effective than traditional face-to-face learning which resists the smooth facilitation of the change occurred as a result of COVID-19 in the education sector. The present paper thus intends to provide an image of the status of ICT learning during COVID – 19 pandemic giving insight to some real-life concerns in education. The paper aims to answer two research problems. What is the motivation of the students to take ICT education during a pandemic? And what are the barriers students are facing in ICT education? The present research by evaluating together both the motivation and barriers will present data to understand how realistic it is to suddenly transfer teaching and learning online and whether e-learning will become the new normal far earliest and to a far greater extent than previously predicted necessitating major advances in the field.

Material and Methods
Procedure

In this study, the cross-sectional design was adopted to collect and analyze the data. The researchers developed the survey form and concluded it before disseminating to the targeted group of respondents. The questionnaire intended explicitly to address research objectives concerning the willingness of the students to use ICT. All participants were educated on the reason for the study and were informed that their participation was intentional and anonymity maintained. They had the rights to decide on the participation or withdraw from the research at any time. The data were collected within a week through distribution done using various communication models and were further analyzed for results.

Sample

The sample target was all the students in India who were using ICT for education. The study used a combination of both convenient and snowball sampling technique to obtain the required sample. The sample consisted of 204 students across different streams of education who were taking regular academic classes online. The majority of the respondents were between 21 to 30 years of age across different streams of education.

Instrument

A self-developed questionnaire of 16 items was used to explore the motivation to use ICT in learning. Section A of the questionnaire was about the demographic background of the respondents that include age, gender, place, the stream of education, etc. Section B of the questionnaire focused on the perceived ease and intention to use ICT. The items were designed and developed by the researchers based on the Technology Acceptance Model (TAM) to provide the answers required for research inquiries.

Data Analysis

The responses given were collected, classified, tabulated, analyzed and interpreted through percentage mapping and graphs. Chi-square Test of Association and Spearman Rank Correlation was used to analyze the significant relationship between various test variables using Statistical Package for Social Sciences (SPSS) version 20.

Results & Discussions

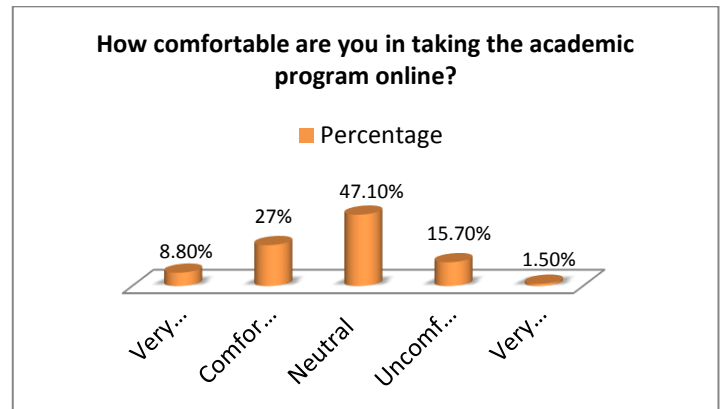| Demographic Variables		Respondents' percentage (%)
Age	Below 20 years	31.86
	21 - 30 years	67.15
	31 - 40 years	0.98
Gender	Male	41.17
	Female	58.82
Place	Rural	38.23
	Urban	61.76
Education	Secondary	1.96
	Higher Secondary	17.15
	Graduation	42.64
	Post-graduation	36.76
	Doctoral Degree	1.47

Stream of Education	Engineering	13.72
	Medical	16.66
	Arts	25.98
	Science	31.37
	Commerce	8.82
	Vocational Training	0.98
	Other	2.45
Total		204

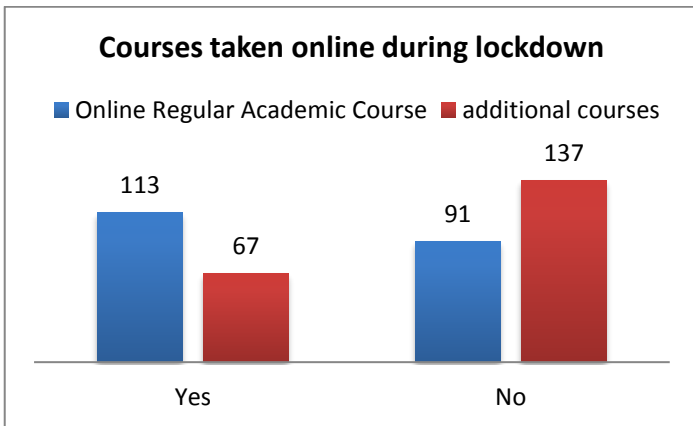**Table 1:** Showing the sample's demographic characteristic

The sample predominantly consisted of students aged between 21 to 30 years (67.15%), more females (58.82%) and from urban parts of the country (61.76%). 42.64% of students were undergoing their graduation followed by 36.76% pursuing their post-graduation. Most of the students belonged to science (n = 64), arts (n = 53) and medical stream (n = 34).

Figure 1: showing the frequency of online courses taken by students during COVID – 19 Lockdown

Figure 1 depicts that around 55.39% of the sample is engaged in regular online academic courses at present and 32.84% of them are taking additional online courses as well.

ICT tools	Frequency
Zoom	37.25%
Google Classroom	25%
Skype	2.45%
Google Hangouts Meet	1.96%
Coursera	1.96%
Cisco Webex	1.96%
Unacademy	1.47%
Google Duo, Vedantu, Whatsapp, Byjus, SWAYAM, Kahoot, etc	0.49%
Nil	28.92%

Table 2: showing various ICT educational tools used by the sample

The table shows that most of the students are using Zoom (37.25%) and Google Classroom (25%) among other ICT tools for educational purpose. However, it can be seen that around 28.92%
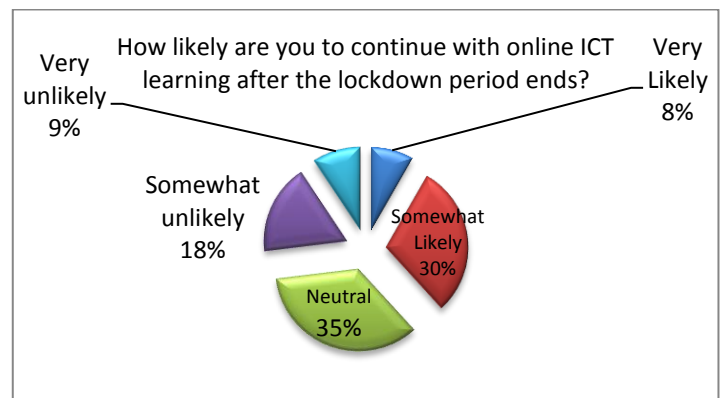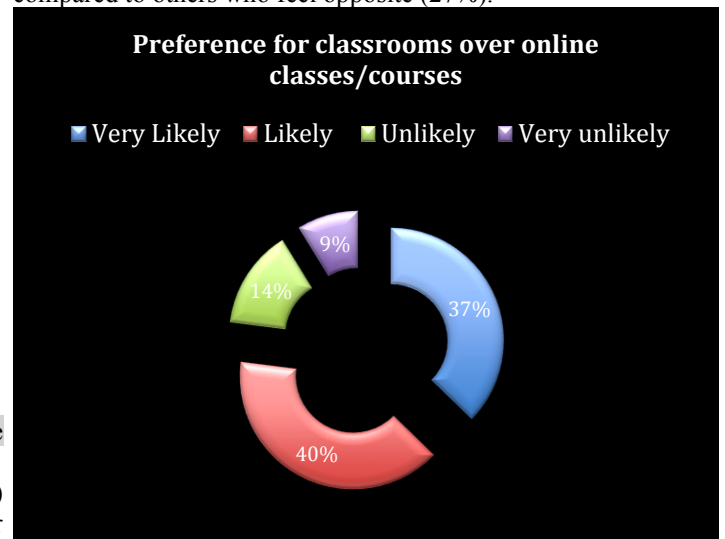
of the sample haven't used any kind of tools so far.

Figure 2: showing the percentage of students comfortable in taking academic programs online

While the majority of the students have indicated being neutral in terms of taking academic classes online, a fair amount of students have reported being comfortable (27%) and very comfortable (8.8%) with it as compared to the other group who is uncomfortable.

Fig 3: shows participants' responses to the question of how likely they will continue ICT learning after the lockdown period

As can be seen from the pie chart, overall there were 38% of students who said they are likely to continue ICT learning as compared to others who feel opposite (27%).

Fig 4: showing the preference for classrooms over online

classes/courses

Figure 4 shows a major portion of sample preferring regular classrooms (77%) over online classes (23%).

	1	2	3	4	5	6	7	8	9	10
1. Age	-									
2. Gender	0.33	-								
3. Place	4.82	0.001	-							
4. Education	102.42**	7.29	7.40	-						
5. Duration of using Internet	16.96*	9.48*	4.31	23.25	-					
6. Internet Expertise	11.92*	2.55	1.76	11.45	15.11	-				
7. Undergoing online academic classes	2.52	0.52	1.20	2.89	2.31	4.69	-			
8. Undergoing additional online courses	3.68	0.01	2.97	3.97	6.22	5.67	2.14	-		
9. Ease in using ICT	4.65	7.16	4.61	24.31*	14.64	26.66**	5.26	14.88**	-	
10. Likelihood of continuing ICT	6.15	7.97	6.67	6.05	17.14	17.87*	7.50	24.86**	86.49**	-
11. Preference of Regular/Online Classrooms	3.01	6.96	4.61	12.102	7.62	12.90*	7.63*	3.44	23.25**	13.69
*. Value is significant at the 0.05 level (2-tailed). **. Value is significant at the 0.01 level (2-tailed).										

Table 3: Chi-square Values for variables of the study

Table 3 shows chi-square values for the study variables. It can be seen that age was found to have a significant association with education ($\chi2 = 102.42$), duration of using the internet ($\chi2 = 16.96$) and internet expertise ($\chi2 = 11.92$). There was also an association between gender and duration of using the internet ($\chi2 = 9.48$). Education and ease in using ICT also showed a significant association ($\chi2 = 24.31$). Also, internet expertise showed a significant association with ease in using ICT ($\chi2 = 26.66$), the likelihood of continuing ICT ($\chi2 = 17.87$) as well as the preference of regular/online classrooms ($\chi2 = 12.90$). Experience with regular academic courses showed an association with preference over regular/online classrooms ($\chi2 = 7.63$). Involvement with additional courses also had an association with both ease ($\chi2 = 14.88$) and the likelihood of continuing ICT ($\chi2 = 24.86$).

	1	2	3	4	5	6	7	8
1. Age	-							
2. Education	0.671**	-						
3. Duration of using Internet	0.248**	0.172*	-					
4. Internet Expertise	0.197**	0.076	0.232**	-				
5. Undergoing online academic classes	-0.016	-0.033	-0.019	0.115	-			
6. Undergoing additional online courses	-0.119	-0.061	0.143*	0.045	0.103	-		
7. Ease in using ICT	-0.087	-0.114	-0.033	-0.050	0.036	0.039	-	
8. Likelihood of continuing ICT	0.009	-0.011	0.172*	0.164*	0.091	0.275**	-0.024	-
9. Preference of Regular/Online Classrooms	-0.004	-0.077	-0.017	0.181**	0.158*	0.052	-0.039	0.110

Table 4: Spearman Correlation Matrix for the study variables

Table 4 shows correlation coefficients for all the variables explored in the study. There was a significant positive correlation of age with education ($r_s = 0.671$), duration of using internet ($r_s = 0.248$) and internet expertise ($r_s = 0.197$). The education and duration of using the internet had a significant low positive correlation ($r_s = 0.172$). There is also a significant but weak positive correlation

between internet expertise and the likelihood of continuing ICT ($r_s = 0.164$) and preference of regular/online classrooms ($r_s = 0.181$). Additionally, there was a significant positive correlation of the likelihood of continuing ICT with engagement in additional online courses ($r_s = 0.275$). Also, there was a significant positive correlation obtained between those who preferred regular classroom and those who undergoing their regular online academic courses ($r_s = 0.158$).

Problems	Rural	Urban	Total (From sample)
Poor Internet Connectivity	37.69%	62.30%	63.72%
Communication Issues	16.66%	83.33%	5.88%
Poor Physical Infrastructure	54.54%	45.45%	5.39%
Language Concerns	44.44%	55.55%	4.41%
Data pack exhaustion	33.33%	66.66%	1.47%
Lack of experience in using ICT	0	100%	1.47%
Boring	50%	50%	0.98%
Physical Troubles	0	100%	0.98%
No problems	41.17%	58.82%	16.66%

Table 5: showing the list of problems sample mentioned in using ICT

Table 5 displays poor internet connectivity as a major problem in using ICT in both rural and urban areas. The second topmost being communication issues followed by poor physical infrastructure.

Discussions

The present study attempted to explore the interest and motivation of students to use ICT tools for their education during COVID – 19 pandemic. It was seen that majority of the sample was engaged in taking online academic classes offered by their educational institutes during this time. ZOOM and Google Classroom were the most frequently used tool for learning and teaching. The main finding of the study suggests that with a decrease in age and education, there is an increase of ease in using ICT. The younger generation would be certainly more comfortable with the digital world as they are rightly called 'digital natives' (Prensky, 2001). Older the generation, the more sceptical they are about the benefits of technology. The use of new technological devices becomes more difficult mainly due to attitudinal and functional obstacles (Neves et al, 2013). The younger students, because of their higher digital literacy, express more ease in using ICT tools for academic purposes. Also, the significant result stating lower the education, higher the ease in using ICT can be driven by the considerably lower average age of the participants. Hargittai (2003) also supported that having a more significant level of conventional literacy influences the prospect of having proficiency in digital skills necessary for online learning.

Supporting the previous notion of digital literacy, another significant finding of the research states that the more students consider themselves having internet expertise, the more is their likelihood of continuing ICT and more they prefer online classrooms over regular classrooms. Also with ease in using ICT, the likelihood of engaging in online additional courses increases apart from the regular ones. Those involved in additional courses reported continuing ICT even after the lockdown ends. Student's acquaintance with various ICT skills such as word processors, presentation software, email and web browsers helps facilitate a rich experience of learning. Those with the necessary skills will certainly have more acceptance to the sudden shift that occurred in education because of the lockdown (Zameni & Kardan; 2010).

Those students who are presently undergoing their regular academic classes online showed a preference for digital classrooms instead of regular traditional classrooms. This is because of the various advantages a digital classroom offers to the students over the traditional classroom. It provides students with a comfortable learning environment which is also less intimidating, helps in the increase of information flow and most importantly allows them to learn at their own pace. Besides, online learning is cost-effective, convenient and flexible and also allows learning of useful digital skills needed in this digital world to survive.

Another significant observation was that those who were at ease in using ICT are unlikely to continue ICT after the lockdown and also prefer traditional classrooms. There might be various possibilities for this result one being more comfortability with the traditional education system as it's been a way of learning since the start of their education experience. Also, virtual learning requires significantly more motivation and attention (Quesada-Pallarès et al, 2019; Hartnett, 2016; Giesbers, 2013). Students find it difficult to focus on a video screen with various distractions at their place. Normative beliefs about education can make them think e-learning experience being a meagre substitute for the real classroom. Compared to face-to-face learning, online learning brings forth substantial deficits in the online mode such as dearth of human connect, lack of opportunities of collaborative learning, teacher supervision and the most evident being lack of opportunities for practical knowledge in intricate subjects such as science, mathematics, and medicine which also might be the reason for resisting the change to digital education.

Above findings can also be explained in terms of the usage gap as mentioned by Dijk & Hacker (2000) wherein those people who are familiar with ICT and can profit from its applications for education, are the ones who use ICT frequently for entertainment purposes. Kvavik (2005) likewise asserted that elevated levels of access and utilization of technological devices, alongside the students' technical expertise won't certainly make them prefer technology for learning activities. Byungura et al. (2018) in his study found that even though smartphones are the most owned, accessed, and used by students, they seldom or not once have used them for education. This explains why a student who have access to ICT tools and command the digital skills necessary to use them but may not feel the need, obligation, or effort to use them for learning.

Besides, self - motivation and self – discipline are two major requirements for online learning. If students are not motivated enough to learn by their own they might not benefit from the digitalization of learning (Sahib, 2020). Patterns of internet consumptions tend to also vary greatly as a function of personality. For example, Extraversion, Neuroticism and Openness are positively linked to online educational activities than other online activities such as leisure, shopping, etc. (Mark & Ganzach, 2014). The role of personality in motivation to use ICT can be explored in related future studies.

While exploring the issues in using ICT, most of them reported

poor internet connectivity and communication issues as the biggest hurdle. Without a proper internet connection, online video sessions, e-resources and e-libraries are difficult to access. Current digital education is not at par with students from different subjects, who require a one-to-one interaction which happens only in the classroom. Barriers due to social cleavages like English language proficiency, or expertise in dominant regional languages makes it burdensome for some students to access information and learn through the internet. Because of all these issues its more likely for students to prefer traditional classrooms over ICT for education even in the face of having the basic ICT skills too. Nagar (2020) also concluded that students prefer more of hybrid learning as compared to restricting themselves only to digital education. Most students prefer technology to a moderate degree and more as a supplement to traditional classrooms (Kennedy et al., 2008). Even though attitudes towards ICT use and its experience is different for different students, adapting to technology is the need of the hour no one can deny and hence measures for enhancing student's experience is a requisite.

Practical Implications of the study

This research can be considered as an added value to the existing literature by exploring the motivation of students to adapt to ICT and challenges associated with it during the pandemic. It demonstrates the attitudes of the present students towards e-learning. It conveys the need for the older generation to train themselves in technology while also identifying how even with the presence of digital skills students may not be motivated to study online. The research thus offers practical insights to the educational institutes, policymakers, academicians, researchers and other stakeholders across the different developing countries who are in the process of implementing ICT by considering the imperative awareness that comes from this research that no one component in itself is sufficient to produce a decent learning experience. It is a combination of all the necessary factors which will contribute to a good e-learning experience.

The government and other policymakers should help provide access to the internet and other ICT facilities to students which will rule out barriers of connectivity in the educational process. One also needs to understand the role of teachers in the learning process and make sure that teachers are equipped with the vital ICT skills, support, and positive outlook concerning incorporating ICT in their teaching practices. The teachers need to support the utility of ICT by exhibiting positive behaviours to sustain the interests and involvement of the students' in online learning. These might include interacting with learners online, offering valuable and productive feedback, helping settle technical problems of using ICT tools, improving students' autonomy, sharing quality and engaging contents to name a few.

Additionally, self-direction, self-motivation and discipline are the three essential requirements for online learning which should be facilitated. Understanding one's learning style, keeping the end goal in mind, planning a schedule will assist in a smoother process of online learning. Also having a plan B when technology fails like up-to-date software and having a backup device for joining the online class in cases of virus attacks or power failure is beneficial. Making connections with other peers and rewarding oneself time to time will help retain an interest in learning. Together these

components will increase the likelihood of outstanding experience of ICT in education. The health of the students is as important as their education and the right usage of ICT can take care of both. There is every need to adopt technology as nobody knows how long the lockdown will continue. Moreover, the pandemic should be seen as an opportunity for preparing us in times of other such crisis in the near future. The advancement in ICT education should be the global concern and of foremost importance.

Conclusion

ICT has renovated the educational landscape across the globe due to COVID-19 restraints. The present study provided the current status of ICT use which revealed that internet expertise is a good predictor for preference in engaging in ICT learning. Age and education also have a significant influence on digital learning. However, having digital competency alone doesn't develop interest and inclination for online learning. The student's, as well as teachers' readiness and preparation for the change, learners motivation, confidence, personality, family involvement, also plays the important role which the future studies should aim to look at. The barriers students reported such as poor internet connectivity, communication issues, physical infrastructure and language incompetence should be the target to help them with a smooth learning process. Students having all the required resources will study with more interest compared to those with scattered resources. Thus the interplay of both a good attitude and technological infrastructure is essential for better learning experience virtually. Creating this awareness to educational institutions and policymakers will benefit them in designing universal effective e-practices considering various attributes of ICT learning which will prove to be a milestone to the educational experience in the near future.

Suggestions for future Studies

- Other forms of objective assessment may be useful to assess learners' motivation using a range of methods, participants, and courses.
- Future work should further investigate the role of personality characteristics, attitudes, user's experience, social influence, family involvement, etc. in understanding the motivation to use ICT.
- The studies can also investigate the challenges of educating children with disabilities digitally who are excluded from the current sample of the study because of practical issues.

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