A Study Of Students' Attitude Towards ICT At Secondary School Level

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ARTICLE INFO	ABSTRACT
	The rise of online modes of content delivery, termed e-learning, has increased student convenience and provided geographically remote students with more options for secondary education. However, its efficacy relies upon student access to suitable technology and the internet, and the quality of the online course material. With the COVID-19 outbreak, education providers worldwide were forced to turn to e-learning to retain their student base and allow them to continue learning through the pandemic. However, in geographically remote, developing nations, many students may not have access to suitable technology or internet connections. Hence it is important to understand the potential of e-learning to maintain equitable access to education in such situations. This study found the majority (88%) of students at secondary level owned at least one ICT device and had access to the internet. Similarly, most students had adequate to strong ICT skills and a positive attitude toward e-learning. **Keywords:** Learning through ICT, Online education, Secondary Students, Preparedness, NEP 2020

Introduction:

The use of ICT (Information and Communication Technologies) to deliver educational content and learning support now forms a widespread and accepted norm of many institutes in the education sector across the world (Latchem, 2017; Sharma et al., 2020; Wu, 2016). It's growing leverage in developing countries is assisting in bringing the quality, sustainability, accessibility and delivery of education on par with those of the developing countries. The ICT based innovations and tools from the education institutes in the developing countries have shown promising and significantly positive results (Reddy et al., 2016, 2020c; Sharma & Reddy, 2015; Sharma et al., 2019a, 2020, 2018b). Indeed, ICT is now an integral part of most institutes rather than supporting tools (Bhuasiri et al., 2012; Irfan et al., 2018). the use of ICT is of particular importance for reaching students in geographically remote locations and improving the equity.

Moreover, there are increasing volumes of high-quality resources, including OERs (open educational resources), available for students undertaking e-learning, even if their host institution does not necessarily provide these resources. Other ventures such as MOOCs (massive open online courses) and diagnostic tools, such as the Online Mathematics Diagnostic Tool (Sharma et al., 2019a, 2020) can also increase educational equity for students unable to attend prestigious universities (Gardner & Brooks, 2018; Littlejohn et al., 2016)

Literature Review:

The innovations in information and communication technology (ICT) and its integration into the education sector has massively impacted the education process, particularly in higher education. New learning methods such as web-based or Internet-based delivery modes have evolved into a broad range of learning modes, including e-learning, m-learning (mobile learning), tablet-learning and flipped classrooms (Ansong-Gyimah, 2020; Reddy et al., 2020b). In the recent years, e-learning has become one of the most trending learning methods in academia (Bhuvaneswari & Dharanipriya, 2020). E-learning has been defned as the use of information and communication technologies (ICT) in education which continues to evolve to meet the needs and demands of the students (Bhuvaneswari & Dharanipriya, 2020), E-learning involves the use of technology and web platform to create a two-way platform for communication and discussion between students and teachers, where student-to-student discussions enhance social learning, and teachers provide a scafolded

learning experience for students via timely feedback (Layali & Al-Shlowiy, 2020), E-learning encompasses a broad set of applications and processes such as computer-assisted learning, web-based training, virtual classrooms and digital collaboration (Kashive et al., 2020). is the reason for its popularity results from numerous associated advantages, including (Kashive et al., 2020; Layali & Al-Shlowiy, 2020; Raturi, 2018; Reddy et al., 2020b. Researchers have also highlighted that since e-learning is closely linked to technology, and because students must use these communication tools for learning, their competency and efficacy in the use of such technology is extremely important (Arshavskiy, 2017; Henderson et al., 2017; Sakarji et al., 2019). Kashive et al. (2020) and Rafq et al., (2020) note that positive perceptions and attitudes of students toward technology is a strong determinant factor in a successful e-learning system. In the context of this study, student "attitude" can be defned as the "knowledge, feeling and action of an individual towards learning with technology or e-learning. Bhuvaneswari and Dharanipriya (2020) propose that attitude indicates the degree of potential adaptation to technology, and hence a favourable attitude to e-learning would mean that students would be more likely to accept online learning systems. Similarly, in the present study the term "perception" refers to how an individual feel about the use of technology for learning. Previous researchers have proposed that if students perceive that e-learning is useful and helpful to their studies, they will be more likely to accept it (Dospinescu & Dospinescu, 2020; Mahajan, 2020; Sakarji et al., 2019).

The current study aims to investigate the attitudes and perceptions of secondary students towards ICT.

Methodology:

The survey instrument used in this study was a unipolar Likert scale 1–5 questionnaire administered to the students using Google Forms. The questions were designed to gain an overview of the ICT resources available to the students (e.g. type of electronic devices available; type of internet connection), the preparedness of students toward ICT (e.g. length of time they have been using computers for, amount of time spent on the internet per day, level of ICT troubleshooting skills) and student perceptions or thoughts toward the use of ICT and e-learning. We refer to these aspects as "ICT resources", "ICT literacy" and "ICT perceptions" throughout this paper. Our study population was frst-year undergraduate students enrolled at the secondary schools. A total of 400 students opted to provide informed consent and complete the survey.

The questions that involved a quantizable response (e.g. "how often do you perform the following activities", "how important are the following", "rate yourself on these skills", or "how much do you agree with these statements") were numerically coded in a similar fashion to a Likert scale, ranging from 1 (never/not important at all/no capability/ strongly disagree) to 5 (frequently/very important/excellent/strongly agree).

Results and Discussion:

The current study shows that of the 88% of students who own at least one ICT device, all have access to the internet in some form, whether it be through mobile data, Wi-Fi or broadband, either on campus or at home. In comparison with prior such studies, the study noted an increase in device ownership and Internet accessibility. Given that all participants of this study were students from NCR, they would also have access to computer labs in schools which can be utilised for learning purposes, in addition to their personal e-devices. Overall, these are quite positive trends toward the uptake of digital technologies across the NCR region and the current and future potential for learning through ICT. This concurs with previous studies reporting that technology-enabled learning has been well received by most students (Raturi, 2018; Reddy et al., 2019; Sharma et al., 2020, 2019b). Although there have been drawbacks, as discussed in the introductory sections, initiatives to improve the facilitation of technology-enabled learning. These include the provision of ICT devices and training to students in need. In terms of the technological competency of the students, the overall response was noted to be above average, indicative of widespread technological acceptance. The results for the usage of digital technology indicated that the participants mostly used their technology for accessing and sending emails, followed by accessing online educational resources and social networking websites. The high competency of students in using emails is prominent. In contrast, students' usage of digital library resources and free online course content was considerably lower, predominantly ranging from "rarely" to "sometimes" in the former instance. Hence, we believe that as secondary students, they may have lacked knowledge about these aforementioned resources.

The number of male and female survey respondents were virtually equal, at 49.5% and 50.5% of the total respondents, respectively. The majority of respondents were studying in Government Schools (60%), followed by Private schools (30.8%) and in Renown schools (9.2%). Approximately 69.2% of the students were 15-16 years of age or under, with 25.4% between 14–15 years of age and the over 16 years age bracket making up the remaining 5.4% of students. The majority of students (69.8%) were from NCR, with the next highest numbers of students from the Rural areas (7.8%), and rest were from near urban areas (6.1%). ICT resources of the 100 students who provided a valid response as to which ICT devices they own, 88.2% of all students reported owning at least one ICT device. The likelihood of a student owning at least one ICT device was not influenced significantly by their gender, age bracket, nationality or program of study. The majority of students (67.6%) owned a laptop, with approximately 9% of students owning a desktop computer and 13% owning a tablet or iPad. Only 22.3% of students reported owning a smartphone in the present study.

Table: 4.11 Percentage of time spent (per day) by the students for each purpose (School or edutainment)

Sample Size: 400

Time spent (School or edutainment)					
	< 1 h	1-4 h	5-8 h	>9h	Sum
< 1 h	3.1%	4.5%	1.0%	1.7%	10.5%
1-4 h	12.2%	27.4%	17.0%	5.2%	60.7%
5-8 h	5.6%	11.1%	3.5%	1.0%	20.7%
>9h	0.7%	3.1%	1.0%	1.7%	6.4%
Sum	21.0%	45.8%	22.4%	9.8%	

The majority of students (60.7%) reported spending between 1–4 h per day on the internet for university or school-related purposes, with around a fifth spending 5–8 h per day on these activities. Over 6% of students used the internet for over 9 h each day for university purposes. Slightly more students than this (9.8%) used the internet for over 9 h each day for edutainment, which can be loosely interpreted as media intended to be both educational and enjoyable. As defined in the survey provided to students, this includes purposes such as games, music, videos and social networks. Students' distribution across the other three-time brackets for edutainment followed an approximately normal distribution, with almost half (46%) spending 1–4 h on it per day.

Table:4.12 (Participation of Students in the ICT activities)

Sample Size: 400

Activity	Never	Rarely	Sometimes	Very often	Frequently
Email	0%	3.5%	21.2%	28.1%	47.2%
Downloading music & video	3.8%	18.9%	36.0%	18.5%	22.7%
Communication (non-email)	1.4%	6.3%	20.6%	32.2%	39.5%
Social networking	2.1%	6.3%	26.9%	30.4%	34.3%
Reading wikis	12.1%	26.4%	35.7%	18.2%	7.5%
eBooks	16.7%	27.3%	32.3%	14.2%	9.6%
Reading free course content	4.5%	12.2%	35.9%	32.4%	15.0%
Learning management system	9.5%	15.5%	35.6%	24.7%	14.5%
Digital library	12.5%	21.8%	33.9%	21.4%	10.4%
Playing games	17.0%	21.2%	27.9%	17.0%	17.0%
Online educational resources	0.7%	4.2%	19.8%	44.4%	30.9%
Attending online mentoring	9.8%	18.9%	26.9%	30.4%	14.0%

Further breakdown of time spent on the internet revealed that students reported their most frequent activity as email, followed by accessing online educational resources and communication (through non-email means such as Skype, Viber, Facebook/Instagram or online forums) and social networking. The majority of students reported accessing their online educational resources "very often" and reading free course content "sometimes"

Table:4.13 (Self-reported ratings of the Students awareness towards ICT)

Sample Size:400

Activities	Fair (Percentage)	Good (Percentage)	Excellent (Percentage)
Technical use of computers			
Turning on a computer	1.7	11.5	86.8
Customising desktop environment	10.5	25.7	63.8
Opening a file	2.8	14.6	82.6
Copying and deleting a file	1.7	11.5	86.8
Organising and managing files	6.8	23.5	69.8
Connecting to Internet	3.5	20.8	75.7
Installing a program	16.5	28.7	54.7
Printing a document	10.9	25.2	63.9
Placing an image on a document	10.7	20.4	68.9
Using MS Word/Excel/PowerPoint	12.7	28.4	59.0
Information literacy			
Downloading files	5.5	19.7	74.8
Saving image from web	6.8	16.8	76.3
Emailing	7.4	21.3	71.3
Creating web pages	3.2	36.2	26.6
Sending attachments	10.6	26.2	63.1
Able to use search engines	8.7	20.0	71.3

Using keywords to find information	11.2	29.5	59.3
Using given URL to look for information	15.0	25.6	59.3
Using bookmark	23.4	30.2	46.4
Using advanced search	22.6	33.5	44.0
Navigating through web pages	14.8	32.2	53.0
Internet browsing	4.6	25.2	70.2
Presentation tools	22.9	37.5	39.5
Participating in social networks	20.4	30.9	48.7
Using the Internet safely	16.3	30.7	53.0

A common definition of ICT literacy is "an individual's ability to use computers to investigate, create, and communicate in order to participate effectively at home, at school, in the workplace, and society" (Fraillon et al., 2013). Hence, it is informative to assess the length of time spent and activities performed by students using ICT and their efficacy at performing various common ICT-related tasks. In general, the students in this cohort reported strong skills in computers' technical use. Their average information literacy was a little lower compared to their technical capabilities. Still, it ranged between "good" and "excellent" for the majority of students.

Table: 4.14 Attitude of Students towards ICT at Secondary level

Sample Size:400

Statements	No capability	Low capability	Fair	Good	Excellent
I feel confident in using computers	0%	1.0%	5.9%	30.6%	62.5%
I feel confident in using the computer organize tools	0%	1.4%	13.5%	40.4%	44.7%
I feel confident in organizing and managing files	0%	1.4%	12.7%	33.5%	52.5%
I feel confident troubleshooting computer problems	0.4%	7.5%	30.6%	32.7%	28.8%
I can complete the required task using the learning tools if I have the manuals for reference	0%	2.5%	16.5%	33.1%	47.9%
I can complete the required task using the learning tools if I have the built-in facility for assistance	0.4%	2.1%	16.3%	38.2%	43.1%
I can complete the required task using the learning tools if someone showed me how to do it first	0%	0.4%	7.4%	32.2%	60.1%
I enjoy using ICT for my studies	0%	0.7%	8.2%	27.9%	63.2%
I believe that e-learning gives me the opportunity to acquire knowledge	0%	0.4%	7.1%	26.6%	66.0%
I believe the e-learning enhances my learning experience	0%	0.7%	6.4%	26.3%	66.5%
I believe that e-learning increases the quality of learning because it integrates all forms of media	0.4%	0.7%	7.8%	31.9%	59.2%
I feel satisfied with my learning content by adopting to e-learning technology	0.4%	0.7%	12.0%	36.0%	50.9%
I would be interested in studying courses that use e-learning	0.7%	1.1%	15.4%	28.6%	54.3%

The majority of students (55.6%) reported either "loving" or "liking" new technology and that they were usually the first to try new technology among their acquaintances. Only 19% of students reported that they "were not used to new technology" or were "one of the last people to try new technology", suggesting an overall positive attitude and interest towards ICT among the student.

Table:4.15 Importance of various online resources related to ICT (reported by the students)

Sample Size:400

Importance	Not important at all	Not important	Neutral	Important	Very Important
Email groups	0.3	0	10.8	34.4	54.5
Video and audio tutorial	0	0	4.9	24.0	71.2
Blogs	1.9	0	46.5	34.9	16.7
Social Networking sites	1.5	0	37.1	40.9	20.5
Wikis and podcast	3.5	0	42.3	36.9	17.3
eBooks	4.5	0	34.8	37.8	22.8
Open Educational Resources	0.3	0	8.4	37.6	53.7
Learning Management System	0.7	0	17.3	37.4	44.6
Digital Library	1.1	0	19.3	40.7	38.9
Education games	3.8	0	34.6	39.5	22.1
Attending online mentoring	0.4	0	20.1	39.4	40.1

The most important uses of ICT, as reported by the student cohort, were for video/audio tutorials, email groups and open education resources. Only a few students reported the use of education games, blogs, social networking sites or wikis podcasts for education purposes.

Table: 4.16 (Attitude (Self-reported) of students in the use of ICT)

Statement	No capability	Low capability	Fair	Good	Excellent
I feel confident in using computers	0%	1.0%	5.9%	30.6%	62.5%
I feel confident in using the computer organize tools	0%	1.4%	13.5%	40.4%	44.7%
I feel confident in organizing and managing files	0%	1.4%	12.7%	33.5%	52.5%
I feel confident troubleshooting computer problems	0.4%	7.5%	30.6%	32.7%	28.8%
I can complete the required task using the learning tools if I have the manuals for reference	0%	2.5%	16.5%	33.1%	47.9%
I can complete the required task using the learning tools if I have the built-in facility for assistance	0.4%	2.1%	16.3%	38.2%	43.1%
I can complete the required task using the learning tools if someone showed me how to do it first	0%	0.4%	7.4%	32.2%	6.01%
I enjoy using ICT for my studies	0%	0.7%	8.2%	27.9%	63.2%
I believe that e-learning gives me the opportunity to acquire knowledge	0%	0.4%	7.1%	26.6%	66.0%
I believe the e-learning enhances my learning experience	0%	0.7%	6.4%	26.3%	66.5%
I believe that e-learning increases the quality of learning because it integrates all forms of media	0.4%	0.7%	7.8%	31.9%	59.2%
I feel satisfied with my learning content by adopting to e-learning technology	0.4%	0.7%	12.0%	36.0%	50.9%
I would be interested in studying courses that use e-learning	0.7%	1.1%	15.4%	28.6%	54.3%

Sample Size:400

Table: 4.17 Student attitudes and perceptions toward the use of technology in the learning process
Sample Size:400

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Technology gives me access to a wide range of learning	0%	0%	2.1%	15.8%	82.1%
Technology keeps me connected to the courses I am enrolled in	0%	1.4%	13.5%	40.4%	44.7%
Technology connects me with my peers and facilitate	0%	1.4%	12.7%	33.5%	52.5%
Technology will help me to complete my work faster	0.4%	7.5%	30.6%	32.7%	28.8%
Technology will help me to produce quality work	0%	2.5%	16.5%	33.1%	47.9%
Technology makes learning creative	0.4%	2.1%	16.3%	38.2%	43.1%
Technology will enable me to take control of my learning	0%	0.4%	7.4%	32.2%	60.1%

Virtually all students reported a positive attitude toward the use of technology in the learning process, particularly for keeping connected to their course material and accessing a wide range of educational resources.

Conclusion:

The attitude of the majority of students towards ICT was positive. The students perceived that ICT connected them more with their peers and facilitators, gave them access to wider range of learning materials, made the learning process more creative and enabled self-paced learning. This agrees with a recent study conducted in the South Pacific by Reddy et al., (2020a), who found that the aforementioned benefits of online learning resulted in the positive attitudes toward technology, ensuring that students were open to continued use of ICT.

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