

**TECHNOLOGY IN HIGHER EDUCATION:  
ACCEPTANCE, READINESS AND ADAPTATION  
AMONG STUDENTS**

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## **Introduction**

Over the last few years there has been a proliferation of online courses. There are numerous websites which offer online courses – some just one or two while others which offer a wide range of online courses. Some websites even offer degrees, diplomas and certificate programs. In the E-QUAL project itself, courses within the four broad areas, Critical Thinking, Cultural Studies, Human Ecology and Natural Resources Management were created.

The allure of online courses is not difficult to understand. They can be a cost effective way to reach large number of students. In the era where higher education is becoming costly across the world, this can provide a solution. In the developing world, where the demographic structure is such that there are a large number of school going children, the demand for higher education is increasing at a fantastic rate. Yet, the supply of education through increased seats in existing colleges and universities has not kept pace. Many see online education as a way to increase access. In fact the Government of India has launched its own proprietary platform for online education called SWAYAM. The regulator for higher education in India, the University Grants Commission (UGC) has even allowed up to 20% of all credits in any degree to be taken using online courses.

However the penetration and the success of e-learning is depend on a plethora of things. The first and foremost, particularly in a country like India, is availability of equipment and access to that. Given the relatively low average income and inequality in the country, by no means can we take access to computer and internet as granted. If that is not so, online courses rather than decreasing inequality of opportunity to avail higher education, can actually increase that. This would be a serious problem. While this is a problem that is recognized by many, including governments as is evident through programs like providing free laptops, we do not have any estimate of the proportion of university level students with or without access to computers and internet.

Similarly we need to understand the availability of appropriate courses and attitude of students towards online material and courses. We also need to understand if the familiarity of students to technology, particularly use of computers prior to joining the program of study at the university. This can be crucial in adapting to online courses. Understanding all this will help us to bridge the gap. Educators as well as policy makers will have a better understanding of the needs and hence ways to fulfill those needs.

To that extent we designed and conducted a survey of students in the three cities in India where the partner universities are located – Delhi NCR, Hyderabad and Kolkata. The objective of the study is to understand the readiness of students in the universities in these cities (multiple universities including the partner universities) in terms of physical infrastructure, their prior use of technology, as well as their perception of online courses.

## **Data Collection**

The survey was designed keeping in mind the objectives outlined in the last section. There were a total of 56 questions. The list of questions is included in the appendix.

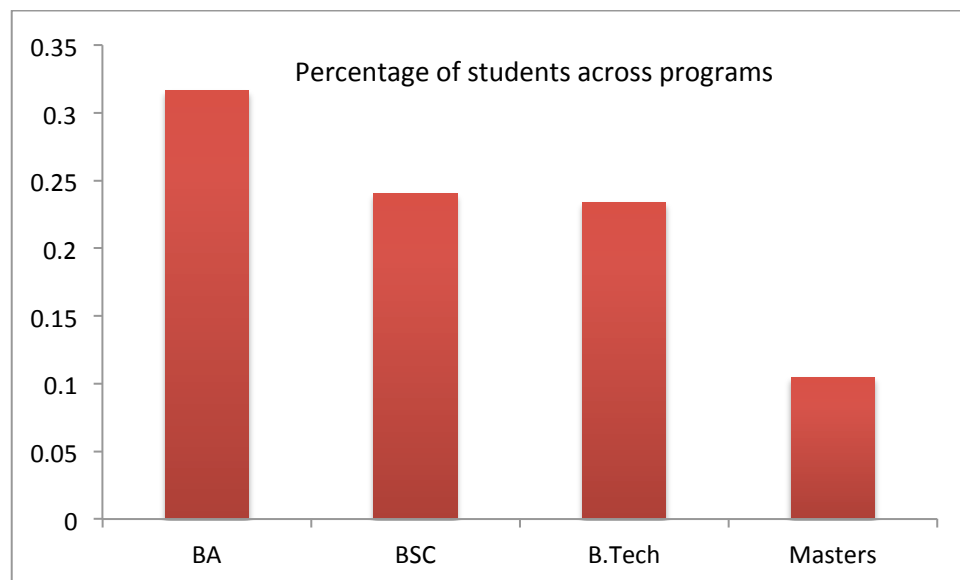
To conduct the survey we created an android app. This was an innovative project in which we involved students to create the app. The students created a survey application designed to fit our needs. This was of great help, since it allowed easy training of surveyors and we did not have to worry of mistakes during transcription of surveys. This also helped us in cutting down the cost of the survey, since android phones are widely used and we did not need any special equipment to conduct the surveys across cities by different set of people. A couple of screenshots are attached in the appendix.

We conducted the survey in the three cities where the partner universities in the E-QUAL project are located – Delhi NCR, Hyderabad and Kolkata. In Delhi NCR we conducted the survey among students in Shiv Nadar University (SNU) and Ambedkar University Delhi (AUD). While SNU is a private university set up under a Uttar Pradesh state legislation, AUD is a state funded university set up by the Government of Delhi. In Hyderabad it was conducted in our partner university in the project, University of Hyderabad. In Kolkata the survey was conducted in three universities each, one of which was the partner university –

Jadavpur University and two other universities, Rabindra Bharati University and Presidency University. In Delhi NCR, both universities were partner universities, Shiv Nadar University and Ambedkar University, Delhi.

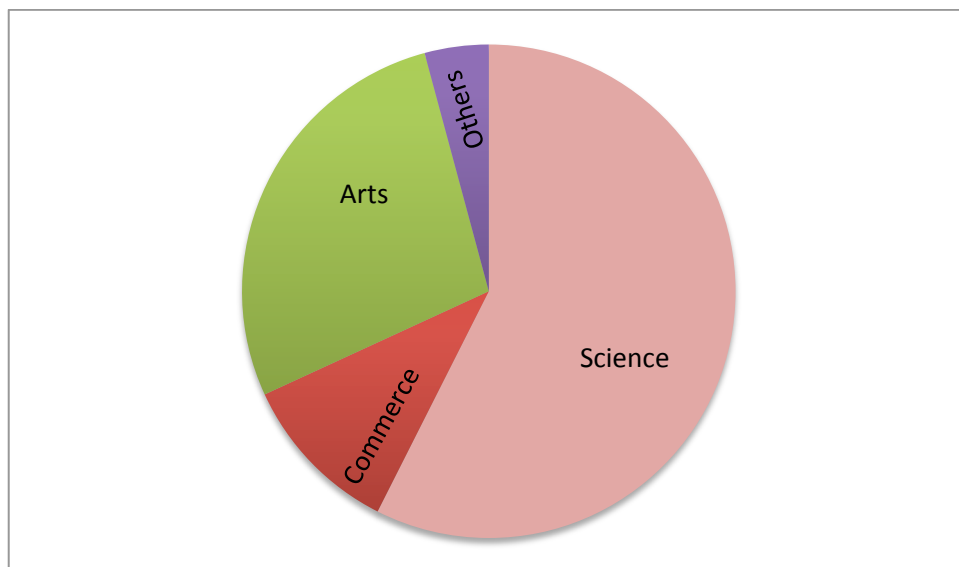
### Data Analysis

A total of 487 students across these universities were surveyed. There were 198 respondents in Kolkata, which is about 40% of total number of students surveyed; 116 in Hyderabad, which is about 24% of the total; and, 173 respondents, or about 36% of the total, in Delhi NCR. 79% of the students surveyed were enrolled in some undergraduate program, of which about 32% in BA, 24% in BSc, and 23% in BTech. Across the cities there were some variations in the share of students across programs. In the sample of Delhi NCR, the weight of students enrolled in B.Tech. was high, 41% of respondents in Delhi were from BTech. Program while the sample from Kolkata had 43.9% from BA program. About 10% of the students were in a Masters program, within which a majority was in MA program. 8% respondents were enrolled in some other program.



The undergraduate students were evenly spread across the year of study – 25% in their first year of study, 33% in second year and 37.5% in their third. In India almost all non-engineering programs are three-year programs. Engineering programs are four year programs. Shiv Nadar University has a credit-based system and students across discipline often graduate in four years. Our sample has a few students from the fourth year, about 4%.

A feature of the Indian education system is that students in high school have to choose between various streams - Arts, Commerce, Science. These students generally study different subjects that are often mutually exclusive and even the students are often segregated. This could result in differential exposure to technology at school level and even attitude towards using technology and courses using technology could be different. Our sample has 57.4% of students who studied science in standard 11 and 12. 27.7% had studied Arts and 10.7% had studied Commerce. It is worth mentioning here that in our sample we did not have any student enrolled in a BCom. program.



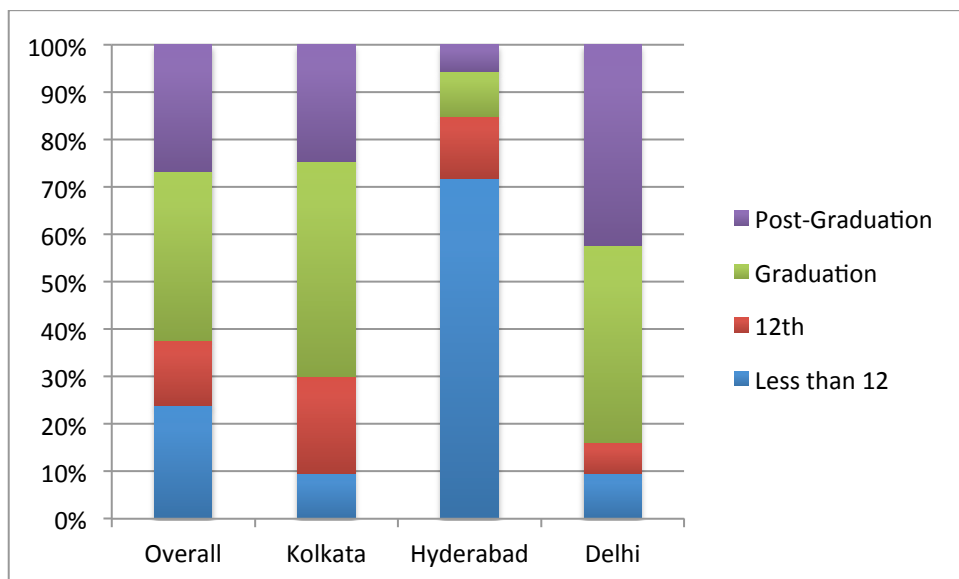
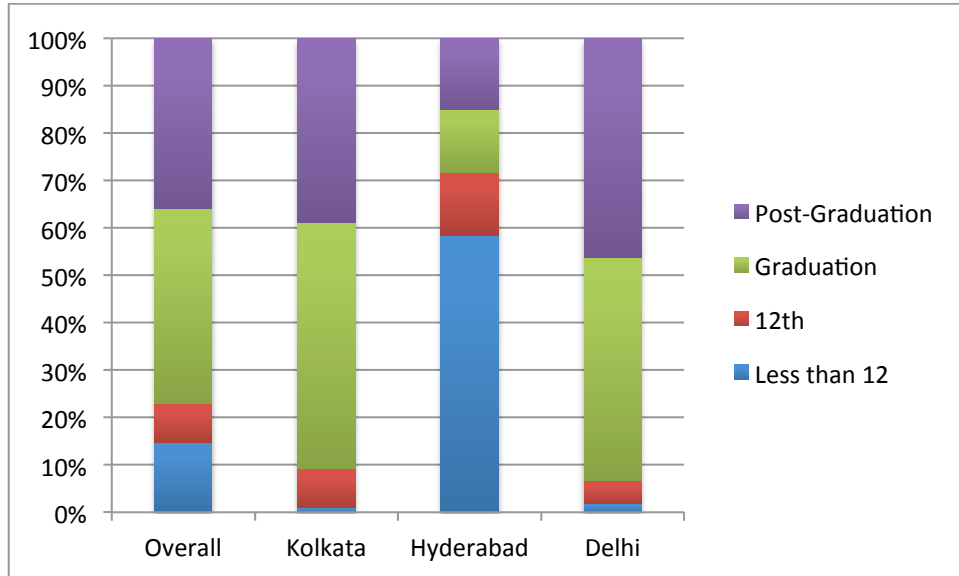
In India, the medium of instruction at the college and university level is overwhelmingly in English. In all of the universities that we surveyed, the medium of instruction is English. Also, almost all online courses and other online resources that is available at the moment are in English (SWAYAM envisions having courses in all Indian languages, but availability of non-English courses is limited at present). Again, this can be an important factor in terms of access to and attitude towards online resources since at the school level a significant proportion of the students receive instruction in a language other than English. We did expect

to see a larger proportion of students in our sample would have had school level education in English, given these are some of the best universities in India and in recent times there's been a move by parents in enlisting their children in private schools that teach in English, particularly among students who are doing well. It turned out that 81.3% of the students in our sample received instructions in English in school. Among those who did not receive instructions in English, 15.9% received instructions in regional languages other than Hindi and only 2.7% received instruction in Hindi. This is an important observation: that overwhelmingly large number of the students in the elite universities come from schools where the medium of instruction is English and among those not receiving instruction in English in school, only a small fraction receive education in Hindi while a bigger fraction receive education in various regional languages. This has important implication in thinking about access and inclusion. If one of the objective in creating online courses is to reduce inequality of access, then we will have to create courses in languages other than English – even in these elite universities, about 20% of the students were from schools where the medium of instruction was not English. However, also important to note is that among these students, only a small proportion is from Hindi-medium schools. So, we must create courses in several languages. This is, of course, quite challenging, but necessary to have the kind of impact that online courses are envisioned to have in India, where access to good quality courses is a major challenge.

There are several studies that show that parents' education levels impact various outcomes from education to health to lifetime income and wellbeing. Does that also impact access to online courses and ease of adaptation to online courses? To understand that we collected data on education levels of both mothers and fathers.

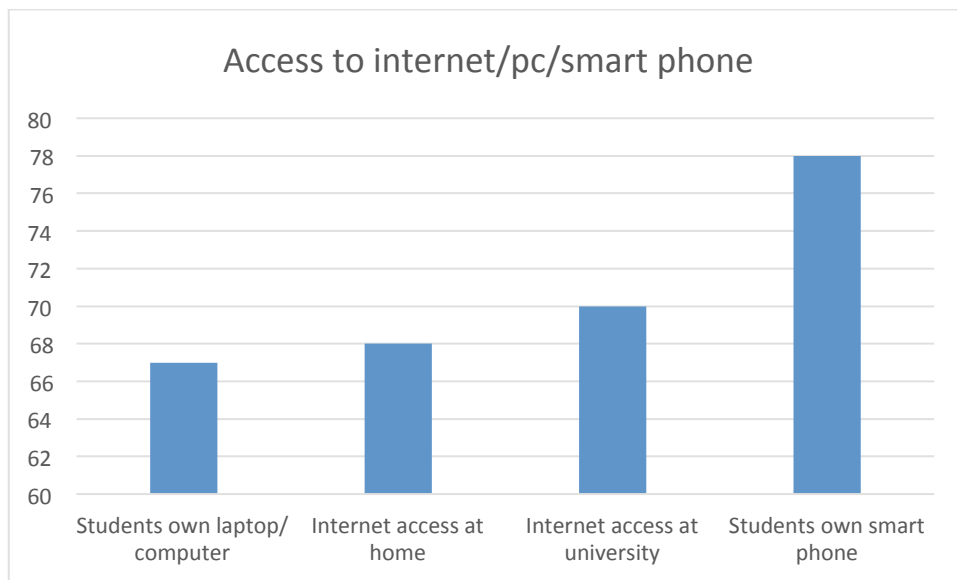
What we found was interesting. 77% of the fathers and 62.5% of mothers of the students in our sample had at least a graduate degree. Given the low share of people who are at least college graduates in the whole population of the country, this only indicates the elite nature of these universities and possibly how intergenerational mobility in educational outcomes is low. What is more interesting is the regional variation in this data, which is quite stark. In Kolkata, only 1% of the surveyed stated that their father had no college education (i.e., education level is standard 12 or less). Similarly, that number was just 1.7% in Delhi. But, in Hyderabad 53.4% of the students surveyed had fathers who had no college education. The numbers are similar if we consider education of mothers. In Kolkata and Delhi about 9% of

students stated that their mothers did not have any college education, but 65.5% of students in Hyderabad are from families where their mothers did not have college education.



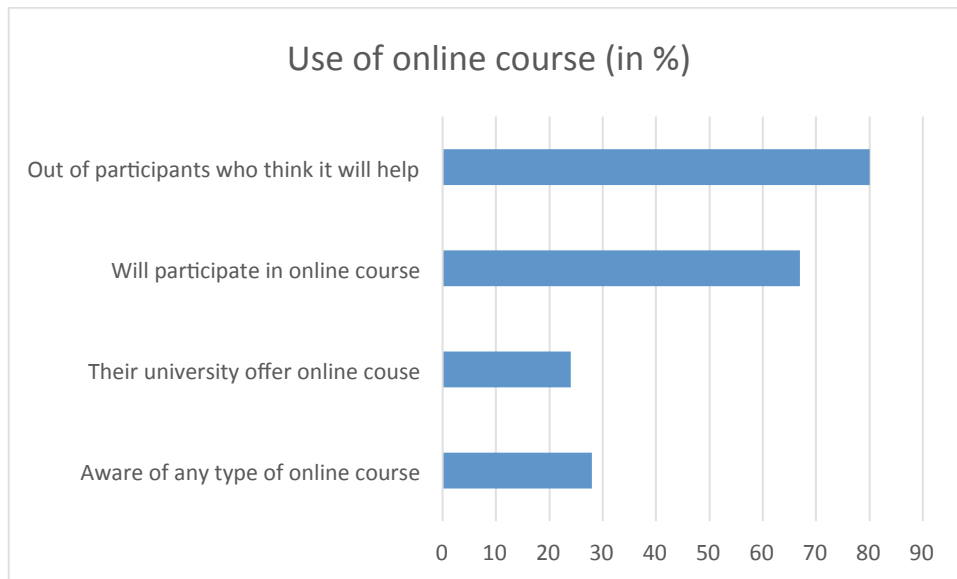
To think about access, understanding family background is important and the above analysis paints an interesting picture. Another aspect that we need to look at is familiarity and access to device and internet connection prior to college and while at college or university. Our next set of questions look at that.

Primary investigation also suggests that that only 67 percent of the surveyed have either computer or laptop in their possession. The figures are similar for Internet access at home or at the university. This statistics means that one third of the students is still needs some facility at the university or some other place to use e-learning materials. On the other hand penetration of smartphones across the student community in these three cities are high. However, a larger number of students preferred reading course material on a laptop or desktop over phone.



We also investigated the use of online resources. Overall picture suggest that 28 percent students in these three cities are aware of any kind of online courses. Only 24 percent of the respondents suggested that their university offer any kind of online course. But this is a promising figure given the structure of Indian universities. Interestingly an overwhelmingly number of students, 347, are eager to take online course and majority of them (67 percent) believe that it will help them to improve their understanding in a particular subject.





City-wise results suggest that Kolkata and Delhi are ahead of Hyderabad on knowledge, penetration and acceptability of online materials.

## Conclusion

The need for and push towards use of online courses and other resources is now beyond question. However, there is very little data to understand whether the students are ready to go that route. Will a push towards using more and more online recourses for degree programs increase access or increase inequality of opportunity? Are students ready to accept and adapt these courses? What is their attitude towards these online courses? There is very little data to think about these questions and this research tries to fill that gap.

This paper attempts to bridge that gap. We do find that there is a great degree of variation in access of Internet and online materials. There is regional variation, but also depending on the background of the student. Further research is needed to establish the causality.

We also found that many courses do have some online component. However, one surprising finding is that many students are unaware of online courses and have not taken any such course. This is somewhat surprising because in the survey we have included mostly the elite universities. Also because a large number of students have expressed their desire to take online courses.

Further research on the relation between access and outcome will be a good next step. To do that we need to carry on this research for a longer period of time and may establish a panel data. Such research will help us to device better courses, have policies with better outcomes and increase learning in undergraduate programs through technology.

## Appendix

### SURVEY QUESTIONS

Declaration: "The data collected in this survey will be only used for research purpose. Identity of the student will not be revealed to anyone. If the data is made available in the public domain then identity of the students will remain anonymous." (This will go to the first page)

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1. Interviewer ID: (numeric)

2. Suppressed

3. Respondent ID: (numeric)

4. Contact No: (numeric)

5. Age:

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6. Where do you reside? (Radio) (1) Home, (2) University/College Hostel (3) Rented accommodation

7. Home Address Pin code:

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8. Program enrollment (Radio Button)

(1)BA (2) BSC (3) B.TECH (4) MA (5) MSC (6) ME (7) Other

9. Major Subject: (Text)

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10. Year of Study: (1) 1<sup>st</sup> Year (2) 2<sup>nd</sup> Year (3) 3<sup>rd</sup> Year (4) 4<sup>th</sup> Year

11. Study area in 12<sup>th</sup> Standard: (Radio Button)

(1) Science (2) Commerce (3) Arts

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12. Medium of Instruction in 12<sup>th</sup> Standard:

(1) English (2) Hindi (3) Regional

13. Pin of the 12<sup>th</sup> Standard school (Numeric):

13 a. Which locality/town was your school located? (Text)

14. Where did you stay at when you were at school? (1)Home (2) Hostel

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15. Education of your father (Radio): (1) Less than 12 (2) 12<sup>th</sup> Standard (3) Graduation (4) Post-Graduation

16. Education of your mother (Radio): (1) Less than 12 (2) 12<sup>th</sup> Standard (3) Graduation (4) Post-Graduation

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17. Occupation of your father: (1) Service (2) Business (3) Agriculture

18. Occupation of your mother: (1) Service (2) Business (3) Agriculture

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19. Education of sibling 1: (1) Less than 12 (2) 12<sup>th</sup> Standard (3) Graduation (4) Post-Graduation

20. Education of sibling 2: (1) Less than 12 (2) 12<sup>th</sup> Standard (3) Graduation (4) Post-Graduation

21. Education of Sibling 3: (1) Less than 12 (2) 12<sup>th</sup> Standard (3) Graduation (4) Post-Graduation

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22. Is there a computer/laptop at your home: (1) Yes (2) No

23. Yes, then when did your family get that device? ( Radio) (1) since last 1 year (2) since last 2-3 year (3) More than 4 year

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24. Does your home have internet connection? (1)Yes, (2) No

25. Since when? 1) since last 1 year (2) since last 2-3 year (3) More than 4 year

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26. Do you own a personal computer or laptop? (1) Yes (2)No

27. Since when you are using Computer or Laptop? 1) since last 1 year (2) since last 2-3 year (3) More than 4 year

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28. How many hours do you spend on PC or Laptop everyday?

(1) 1 Hour (2) 2 hours (3) 3 hours (4) 4 Hours and more

29. How many hours do you access internet? (1) 1 Hour (2) 2 hours (3) 3 hours (4) 4 Hours and more

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30. Do you have internet access outside college/university? (1) Yes (2) No

31. Do you have access to a computer at university (other than your personal laptop)? (1)Yes (2) No

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32. Is the access to internet is provided by the university? (1) Yes (2) No

33. How many hours do you have access to internet (on campus and outside)? (radio): (1) 1 Hour (2) 2 hours (3) 3 hours (4) 4 Hours and more

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34. What is your primary source of internet connection? (1) Provided by the university (2) internet connection at home (3) mobile phone

35. Is your campus wi-fi enabled? (1) Yes (2) No

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36. What type of mobile phone you use?

(1)Smart Phone (2) Ordinary mobile phone

37. Do you have internet access in your mobile? (1) Yes (2) No

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38. What do you use your phone most for? (1) Making calls (2) sending SMS (3) text using internet (whatsapp, etc.) (3) reading (4) listening to music and watching video (5)Other

39. Do you access course material or readings for your course using your phone? (1) Yes (2) No

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40. How comfortable you are in reading from mobile?

(1) Not Comfortable (2) Little comfortable (3) Comfortable (4) Very comfortable

41. Do any of your courses have online material? (1)Yes (2) No

42. If yes to Q.41, do you think the course was better because of the online material? (1)Yes (2) No

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43. Outside the class how do you primarily communicate with your professor? (1) Face to face communication during office hours (2) Email (3) Phone call (4) Text message(sms, whatsapp, etc.) (5) Forums in LMS (in moodle, blackboard, etc.) (6) Facebook (7) do not communicate

44. Are you aware of online courses? (1)Yes (2) No

45. If yes to Q44, do you think an online course (MOOC) can be a substitute for a traditional course (only through contact)?

46. Does your institute university offer any online/Computer based (only online – no class time) course (MOOCs)? (1)Yes (2) No

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47. Have you taken any online course? (1)Yes (2) No

48. If yes to Q47, then from where? (Text)

49. If yes to Q47, then did you like the idea of online course? (1)Yes (2) No

50. If yes to Q47, then how useful was the online course? (1) Very useful (2) To some extent (3) Not useful

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51. If yes to Q47, was the online course was free? (1)Yes (2) No

52. If yes to Q51, will you be willing to pay for an online course? (1)Yes (2) No

53. If no to Q 51 (i.e., question was the online course was free), how much did you pay? (NUMERIC)

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54. If you have taken online course, why did you take the course? Reason 1: (1) To better understand material covered in class (2) To learn something that was not part of material covered in class, (3) To get a certificate (4) will be useful in getting a job (5) To help me join a higher degree program (6) To further my hobby

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55. If you have taken online course, why did you take the course? Reason 2: (1) To better understand material covered in class (2) To learn something that was not part of material covered in class, (3) To get a certificate (4) will be useful in getting a job (5) To help me join a higher degree program (6) To further my hobby

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55. If you have taken online course, why did you take the course? Reason 3: (1) To better understand material covered in class (2) To learn something that was not part of material covered in

class, (3) To get a certificate (4) will be useful in getting a job (5) To help me join a higher degree program (6) To further my hobby

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56. If you have not taken any online course, would you consider taking an online course? (1) Yes (2) No

Does those courses help you to enhance your understanding?

Do you think online module in particular topic in your subject by renowned professional will be helpful?

Which one of the following will be prefer receiving teachingtaking the course through

1. Computer

2. Mobile

3. Both

4. None



VOLTE

LTE



1:02

Program Enrollment ?

- BA
- BSC
- B.Tech
- MA
- MSC
- ME
- Others

Major Subject

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NEXT







VOLTE

LTE



1:03

## Year of study

- 1st Year
- 2nd Year
- 3rd Year
- 4th Year

## Study area in 12th Standard ?

- Science
- Commerce
- Arts

NEXT



