Youth and Inequality: A Sociological Study of Digital Inequality among Youth in India

Avinash Pandey, Indian Revenue Service, Government of India (corresponding author)
avinashmp73@gmail.com
+91 994-981-7146
E-33C, MIG Flats, Mayapuri
New Delhi, Delhi, India – 110064
Ashvini Pandey, Independent Researcher

Abstract:
Digital divide, traditionally, has been understood as the gap between 'haves' and 'have-nots'. However, with time, the understanding has become more complex and nuanced. First-level digital divide is defined as the gap in access, second-level digital divide is defined as the gap in skills and usage, and third-level digital divide is the gap in outcomes which are relevant in social life. This paper studies third-level digital divide among the youth in India. The youth (sample population) are the university students, who are among the top 4 per cent who have received the benefits of democracy and development. They are expected to be the "demographic dividend", beyond the clutches of digital inequality. This research paper assesses the complex relationship between social inequalities and digital inequality. This research study has adopted a survey-based research approach. It surveyed university students (n=460) from select universities. It concludes (indicates) that third-level digital divide exists among university students in India. Also, the social inequalities reinforce the digital inequality.

Keywords:
Digital Divide, Digital Inequality, Social Inequality, Youth, SDGs

Introduction:

The advent of internet, new media or the digital technologies brings in new forms of inequalities. The inequality in terms of access has been defined as the first-level digital divide, inequality in terms of skills and usage has been defined as second-level digital divide, and the inequality in "outcomes generated online and valuable in social realm" has been defined as the third-level digital divide (Ragnedda 2018). The measure of digital inequality based on access is incomprehensive and limited (Castells 2002, Newhagen and Bucy 2005). It is a multidimensional concept and its understanding must be broadened on the lines of existing concepts of social inequality. The research now looked at how the social inequalities influence or affect the digital inequalities (Zillien and Hargittai 2009, van Deursen and van Dijk 2014). Thus, digital inequalities need to be studied in correlation with the social, economic, political, cultural divides.

This paper will move past the first two levels of digital divide and will focus on the third-level digital divide. This research study has tried to assess three important aspects regarding third-level digital divide. First, does third-level digital divide exist among university students? Second, if the third-level digital divide exists, does the third-level digital divide exists in all the spheres of society – like personal, social, economic, political, technological, etc. – or it is present in some and absent in others? Third, if the third-level digital divide exists, does the digital capital get influenced by social, economic, political, personal capitals (Bourdieu 1983, Becker 1996, Ragnedda 2018)? The paper has focused on third-level digital divide as it has been found in our study of literature that it is an under-explored area of study in India.

This paper is a novel contribution in the field of study of third-level digital divide in India for four reasons. First, in our study of the existing literature, third-level digital divide has been found to

be an under-explored area of study in India as compared to other non-Asian countries. Second, university students as the sample population have not been studied in the context of third-level digital divide in India. Though among BRICS nations, some research has taken place on university students such as in in China (Shao 2012) and South Africa (Oyedemi 2012), albeit only on the first two levels of digital divide. Third, it presents an empirical investigation into the presence or absence, thereof, and the correlating factors that appears to be responsible for it. Last, though it's a preliminary and indicative investigation, it hopes to inspire more research in this domain, and at the same time reorient the thought in policy domain towards a digital society.

This research study has focused on university students' as its population sample. There are three reasons for it. First, India is about to become one of the youngest country in the world by 2020 (Shivakumar 2013). Second, university students' are a niche group among the youth in India, for the Gross Enrollment Ratio (GER) in higher learning in India is only 25.6 percent (Ministry of Human Resource Development 2018). Last, we want to investigate the perceived "notion of children and young people as confident and often "expert" computer users" (Selwyn 2009). This perceived innate confidence and the high-tech activities and expectations of the "net generation" of young people (Selwyn 2009), who "grew up and bathed in bits" (Tapscott and Williams 2008), also known as "Digital Natives" (Prensky 2001) or "homo-zappiens" (Veen and Vrakking 2006), these "New Millennium Learners" (Pedro 2007), warrant further exploration and are thus the focus of this study.

Background:
Digital technologies, in general, and internet in particular, are powerful tools for socio-economic and political empowerment. Similarly, university education too is a powerful means for social mobility. Thus, in this paper, the authors have tried to assess how these two sources work together in the real life of students.

India is expected to become the youngest country in the world with the median age of 29 years by 2020 (Shivakumar 2013). The population of 'youth' (15-29 years) in 2011 was 422 million (Ministry of Statistics and Programme Implementation 2017). It will have 64 percent of the population in the working age group by 2020; and an estimated 464 million population in the age group of 15-34 by 2021 (Shivakumar 2013). The Gross Enrollment Ratio of students (18-23 years of age group) in higher education in India in 2017-18 was 25.4 percent (Ministry of Human Resource Development 2018). India is expected to reap its 'demographic dividend' in times of Fourth Industrial Revolution. However, this demography needs to be of some quality to reap the benefits of Fourth Industrial Revolution, as "quantity may not be of equal quality" (Kumar and Singh 2018).

The Government of India has launched the Digital India Programme. It has three key vision areas – Digital Infrastructure as a Utility to Every Citizen, Governance and Services on Demand, and Digital Empowerment of Citizens (Ministry of Electronics and Information Technology 2018). Digital empowerment of citizens, among other things, entails digital literacy, digital access to all, digital inclusion and digital entrepreneurship (Ministry of Electronics and Information Technology 2018, 2019a, 2019b). The policies of the government are in line to achieve the sustainable development goals (SDGs). In this paper we would like to ascertain our sample population on three SDGs, which are SDG 4 – quality education, SDG 5 – gender equality and SDG 10 – reducing inequality.

A person in India on an average spent 6 hours daily on Internet in 2018. Nearly 460 million Indians were online in 2018 and consumed an average of 8.6 GB data per subscriber per month. Its weekly average of video watching is 8 hours and 28 minutes. India consumed 76 PB of data daily in 2018, 7 PB more than China, a close second (Ernst & Young 2018). In some developed countries people with low education spend more time on the Internet than people with high education (van Dijk and van Deursen 2014). Currently, the age usage gap for the use of particular applications is bigger than the gap for education (van Deursen and van Dijk 2013).

Literature:
Digital divide became popular in 1990s and was understood in terms of 'haves' and 'have-nots' of digital access. Loosely, digital divide was defined as the gap in access to digital technologies in general, and the internet, in particular (NTIA 1999). However, such an understanding of digital divide was questioned and improved upon later (Castells 2002, van Dijk 2005). This gap in access may be intra-national or international (Norris 2001). Such a distinction of the gap in access to internet has been defined as first-level digital divide (Newhagen and Bucy 2005, van Dijk 2005).

With time, as more people got access to the internet infrastructure, a new form of inequality emerged. The inequality in digital skills led to differential usage pattern and differences in digital proficiency. This new form of digital divide and the resulting inequality has been termed as second-level digital divide (Hargittai 2009, van Deursen and van Dijk 2010, Livingstone and Helsper 2010, Ragnedda and Muschert 2018). But, after the question of access and skill gap is resolved, the question is "what are people doing, and what are they able to do, when they go on-line" (DiMaggio and Hargittai 2001). This has brought the focus to what is now termed as third-level digital divide (Ragnedda 2017, van Deursen and Helsper 2015, van Deursen, van Dijk and Helsper 2014). It is defined as the "inequalities in the tangible benefits users gain by accessing and using the Internet" (Ragnedda and Kreitem 2018).

It is also clear that not only digital infrastructure, but it is also the social infrastructure which affects the digital divide (Rooksby, Weckert, and Lucas 2002, Choudrie et al. 2005, Oyedemi 2012). The "[p]atterns of inequality will reflect not just differences in individual resources, but also the way in which economic and political factors make such differences matter" (DiMaggio and Hargittai 2001).

There are various socio-economic and demographic factors which determine or are correlated to the presence of digital inequalities. These are gender (DiMaggio et al. 2001, Chaudhuri et al. 2005), age (Chaudhuri et al. 2005, van Deursen and van Dijk 2009, Hargittai 2010), geography (Hindman 2000, Chaudhuri et al. 2005), experience (Chaudhuri et al. 2005, van Dijk 2006, 2009), education (Attewell 2001, van Dijk 2005, 2006, van Deursen and van Dijk 2009, van Deursen and van Dijk 2009), family structure (Schleife 2010), income (Bucy 2000, Zillien and Hargittai 2009, DiMaggio et al. 2004, Ragnedda and Muschert 2013), ethnicity (Chaudhuri et al. 2005), social capital (Bucy 2000, Zillien and Hargittai 2009, Ragnedda and Ruiu 2017), fluency in English language (Nowce and McKeown 2008) among many others.

The innovation of digital technologies has added "a fundamental cleavage to existing sources of inequality and social exclusion in a complex interaction" (Castells 2002, 247). He further says that, "Our societies are increasingly structured around the bipolar opposition of the Net and the Self" (Castells 1996, 3). van Dijk argues that the relationships between social inequalities and digital outcomes are inverse and reinforcing (van Dijk 2005, Hargittai and Hsieh 2013), however, increase in digital capital may help in enhancing social capital (Zillien and Hargittai 2009). The outcome model employed in this research is inspired from van Dijk's five-point categorization of

activities (in places of educational and institutional activities, we have technological and recreational outcomes).

Research Design:
This research study involves a questionnaire survey based quantitative study. The sample population (n=460) utilized in this study are university students from the different parts of India. However, a predominant number of responses are from students in the northern parts of India. The survey was circulated in the student groups through online mediums like Facebook, Google and WhatsApp. It was also circulated through university portals and their email listings. Thus, both the random and snowball sampling methods were utilized. The survey was open for duration of 15 days in March 2019. Table 1 represents the socio-demographic profile of the respondents.

Particulars	*Count*	*Percent of sample (%)*
Age		
18-21	245	53.3
22-25	175	38
Above 25	40	8.7
Gender		
Male	241	48
Female	219	52
Category		
General	373	81.1
OBC	72	15.7
SC	13	2.8
ST	2	0.4
Religion		
Hindu	360	78.3
Others	100	21.7

Particulars	Count	Percent of sample (%)
Native City		
Tier 1	182	39.6
Tier 2	115	25
Tier 3	119	25.9
Non-Urban Areas	44	9.6
Level of Fluency in English		
Beginner	50	10.9
Fluent	218	47.4
Expert	146	31.7
Native	46	10
Father's Highest Educational Qualification		
0-10th std	46	10.0
11th-12th std	48	10.4
Diploma	6	1.3
Graduation	198	43.0
Post-Graduation	162	35.2
Mother's Highest Education		
0-10th std	78	17.0
11th-12th std	51	11.1
Diploma	0	0

Particulars	Count	Percent of sample (%)
Graduation	167	36.3
Post-Graduation	164	35.7
Annual Family Income		
Less than 2 LPA	73	15.9
2-5 LPA	76	16.5
5-10 LPA	76	16.5
10-15 LPA	80	17.4
15-25 LPA	80	17.4
Above 25 LPA	75	16.3
Number of Siblings		
0	68	14.8
1	269	58.5
2	77	16.7
3	30	6.5
More than 3	16	3.5
Nature of Family		
Joint	113	24.6
Nuclear	347	75.4
Name of University		
Public University	132	36.7
Private University	328	63.3

Particulars	Count	Percent of sample (%)
Professional Experience in Years		
0-1	347	75.4
1-3	86	18.7
3-5	23	5
Above 5	4	0.9

Table 1: *Socio-demographic profile of respondents*

Table 1 represents the independent variables, which project the socio-demographic profile of the respondents. It can be observed that gender ratio is almost equal, with 52% female and 48% male respondents. Also, the family income representation is almost equal, with 51% respondents have family income above Rs. 10 lakh (1 million) while 49% respondents have annual family income less than Rs. 10 lakh.

The dependent variables pertain to information such as an individual's own perception of their competency in using the internet and what they do with time spent on the internet. These questions can be divided into five kinds of outcomes–social, recreational, economic, technical and political–under which each individual's internet usage falls.

Based on previous research, it was clear that it is important to separate "economic, cultural, social and individual outcomes when studying the impact of digital engagement" (Helsper et al. 2015), therefore, we categorized our questions into economical, social, political, technological and recreational outcomes from digital engagements. Figure 1 represents the different type of digital outcomes under study.

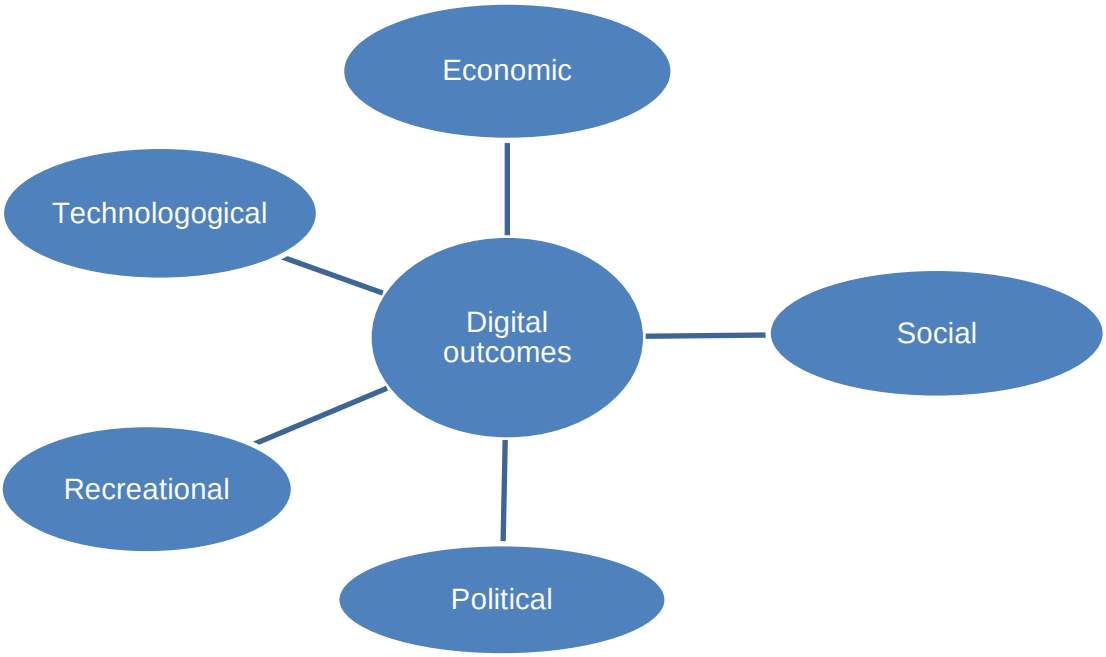

Figure 1: *Classification of Digital Outcomes*

The respondents had to choose from a five point scale – never, rarely, sometimes, often and always. For the purpose of descriptive analysis, the selection of "never" was assigned the numerical value of one and "always" was assigned the numerical value of five. However, in order to find the relation with the independent variables we ran linear regression. For this purpose, the selection of "never" was assigned the value of zero, while the selection of any other option was assigned the value one. The reason for such attribution is the understanding that even if a person has successfully used digital resources for offline benefits once, the third level digital divide is considered to have been bridged for the purposes of this study.

Findings and Analysis:
The study of digital outcomes has been classified into five categories. All the five categories are being discussed in order. Table 2 represents the questions that have been asked to assess the economic outcomes. Table 3 represents the linear regression of the data to examine the correlation between the variables.

S.No.	*Questions*	*Label used*
1	How often do you carry financial transactions online?	Transaction
2	How often do you find internet helpful in accessing any job, internship or conference?	Jobs
3	How often do you find internet helpful for your academic pursuits?	Academics
4	How often do you avail monetary benefit from the internet by making use of your skill(s), service(s) or product(s)?	Monet Benefit

Table 2: *Questions in the survey to assess economic outcomes*

When the regression is performed to understand the economic outcomes, the results are obtained as depicted in Table 3.

VARIABLES	Transaction	Jobs	Academics	MonetBenefit
Age (Base age - 'Below 18')				
18-21	-0.128*	0.0571	-0.0268	-0.236
	(0.0710)	(0.0714)	(0.0315)	(0.160)
21-25	-0.0692	0.0821	-0.0234	-0.199
	(0.0712)	(0.0716)	(0.0316)	(0.161)
Above 25	-0.0163	0.0838	-0.0269	-0.313*
	(0.0767)	(0.0772)	(0.0340)	(0.173)
Gender (Base gender - 'Male')				
Female	-0.0101	-0.00682	-0.00958	-0.0277
	(0.0178)	(0.0179)	(0.00789)	(0.0402)
Others	-0.0715	-0.0797	-0.00875	-0.796**
	(0.139)	(0.140)	(0.0618)	(0.315)
Age at which Internet was first accessed	-0.00496*	-0.00111	0.00190	0.00215
	(0.00290)	(0.00292)	(0.00129)	(0.00656)
Total number of devices used	-0.00754	0.000174	-0.00123	0.0111
	(0.00812)	(0.00816)	(0.00360)	(0.0184)
Category (Base category - 'ST')				
SC	-0.0388	-0.0278	0.0258	0.225
	(0.142)	(0.143)	(0.0631)	(0.322)
OBC	0.0331	0.0319	0.00399	0.303
	(0.134)	(0.135)	(0.0595)	(0.303)
General	0.0464	-0.0463	0.00193	0.352
	(0.133)	(0.134)	(0.0589)	(0.301)
Native city (Base type - 'Tier 1')				

VARIABLES	Transaction	Jobs	Academics	MonetBenefit
Tier 2	-0.0517	0.0238	0.0129	-0.0127
	(0.0330)	(0.0332)	(0.0146)	(0.0747)
Tier 3	-0.0501	-0.00709	0.0225	-0.0117
	(0.0349)	(0.0351)	(0.0155)	(0.0790)
Non-Urban area	-0.0591*	0.0183	0.0248*	0.00316
	(0.0336)	(0.0338)	(0.0149)	(0.0759)
English Fluency (Base level - 'Beginner')				
Fluent	0.111***	0.0979***	0.0551***	-0.0516
	(0.0313)	(0.0315)	(0.0139)	(0.0708)
Expert	0.125***	0.0982***	0.0531***	-0.0447
	(0.0362)	(0.0364)	(0.0160)	(0.0818)
Native	0.114***	0.120***	0.0576***	-0.0273
	(0.0423)	(0.0425)	(0.0187)	(0.0956)
Father's highest education (Base level - '0-10th std')				
11-12th std	-0.0373	-0.0617	0.0334*	0.0606
	(0.0407)	(0.0409)	(0.0180)	(0.0919)
Diploma	-0.134*	-0.210***	0.0331	-0.0986
	(0.0803)	(0.0808)	(0.0356)	(0.182)
Graduation	-0.0335	-0.0715*	0.0310*	0.0485
	(0.0370)	(0.0372)	(0.0164)	(0.0837)
Post-Graduation	-0.0396	-0.0419	0.0247	0.0403
	(0.0416)	(0.0418)	(0.0184)	(0.0941)
Mother's highest education (Base level - '0-10th std')				
11-12th std	0.0278	0.0986***	0.0127	0.114
	(0.0346)	(0.0348)	(0.0153)	(0.0782)

VARIABLES	Transaction	Jobs	Academics	MonetBenefit
Graduation	-0.0337	0.0590*	-0.0101	0.107
	(0.0348)	(0.0350)	(0.0154)	(0.0786)
Post-Graduation	-0.0301	0.0581	-0.00620	0.106
	(0.0383)	(0.0386)	(0.0170)	(0.0867)
Annual family income (Base level - 'below 2 lpa')				
2-5 lpa	0.0562*	0.0508	-0.0203	0.0810
	(0.0320)	(0.0322)	(0.0142)	(0.0724)
5-10 lpa	0.0475	0.0320	-0.00366	0.0692
	(0.0333)	(0.0335)	(0.0148)	(0.0754)
10-15 lpa	0.0430	0.00321	-0.00480	0.0659
	(0.0360)	(0.0362)	(0.0160)	(0.0814)
15-25 lpa	0.0455	-0.00212	-0.00723	-0.0843
	(0.0371)	(0.0374)	(0.0165)	(0.0840)
Above 25 lpa	0.0680*	0.0302	-0.00345	-0.0400
	(0.0384)	(0.0386)	(0.0170)	(0.0867)
Number of siblings	-0.00259	-0.0126	-0.0106**	-0.00185
	(0.0107)	(0.0107)	(0.00473)	(0.0241)
Nature of family (Base nature - 'Joint')				
Nuclear	0.00478	-0.0346*	-0.00425	-0.0472
	(0.0206)	(0.0207)	(0.00912)	(0.0465)
Professional experience (Base Years - '0-1 years')				
1-3 years	-0.0179	0.00203	0.00491	0.0509
	(0.0233)	(0.0234)	(0.0103)	(0.0526)
3-5 years	-0.105**	0.0358	0.00736	0.111
	(0.0453)	(0.0456)	(0.0201)	(0.102)

VARIABLES	Transaction	Jobs	Academics	MonetBenefit
Above 5 years	-0.0512	0.0283	-0.0116	0.0179
	(0.104)	(0.105)	(0.0463)	(0.236)
Constant	1.067***	0.851***	0.931***	0.546
	(0.163)	(0.164)	(0.0721)	(0.368)
Observations	460	460	460	460
R-squared	0.123	0.113	0.107	0.075
Standard errors in parentheses				

***** p<0.01, ** p<0.05, * p<0.1**

Table 3: *Linear regression to study economic outcomes*

It has been observed that level of fluency plays a key role in obtaining tangible economic outcomes using the internet. The age at which the respondent was introduced to the internet, parental educational qualification and number of siblings are some other factors which significantly influence the economic outcomes. It has been observed that either very low income or very high income have a significant effect on the economic outcomes.

Table 4 represents the questions that have asked from the respondents to understand the tangible social outcomes that they gain from their internet access. Social outcome refers to the social benefits accrued to the respondent in the real world by virtue of their usage of internet (presence in virtual world).

S.No.	Questions	Label used
1	How often do you find internet helpful in strengthening your academic or professional relationships with people?	Relationships
2	How often do you meet with people you have connected over online dating apps?	Dating
3	How often does internet influence your perception of gender?	PerGender
4	How often does internet influence your perception of religion?	PerReligion

Table 4: *Questions in the survey to assess social outcomes*

Table 5 represents the result of linear regression with respect to social outcomes on the usage of the internet.

VARIABLES		Relationships	Dating	PerGender	PerReligion
Age (Base age - 'Below 18')					
	18-21	-0.0876	-0.260	0.0256	-0.145
		(0.0783)	(0.194)	(0.154)	(0.174)
	21-25	-0.0805	-0.181	0.0697	-0.135
		(0.0785)	(0.194)	(0.155)	(0.174)
	Above 25	-0.0675	-0.172	0.00125	-0.211

VARIABLES	Relationships	Dating	PerGender	PerReligion
	(0.0846)	(0.210)	(0.167)	(0.188)
Gender (Base gender - 'Male')				
Female	0.00716	-0.0283	0.0606	0.0184
	(0.0196)	(0.0486)	(0.0387)	(0.0435)
Others	0.0691	-0.104	0.289	0.309
	(0.154)	(0.381)	(0.303)	(0.341)
Age at which Internet was first accessed	-0.00577*	-0.00967	0.00169	0.0117*
	(0.00320)	(0.00792)	(0.00630)	(0.00709)
Total number of devices used	0.00914	0.0464**	-0.0131	-3.14e-05
	(0.00895)	(0.0222)	(0.0176)	(0.0199)
Category (Base category - 'ST')				
SC	-0.0597	-0.284	-0.140	0.353
	(0.157)	(0.389)	(0.309)	(0.348)
OBC	-0.0402	-0.0804	-0.222	0.225
	(0.148)	(0.367)	(0.292)	(0.328)
General	-0.0842	-0.149	-0.207	0.261
	(0.147)	(0.363)	(0.289)	(0.325)
Native city (Base type - 'Tier 1')				
Tier 2	0.0713*	0.208**	0.0327	0.0581
	(0.0364)	(0.0902)	(0.0717)	(0.0808)
Tier 3	0.0545	0.166*	0.0951	0.0941
	(0.0385)	(0.0954)	(0.0758)	(0.0854)
Non-Urban area	0.0138	0.209**	0.125*	0.0965
	(0.0370)	(0.0917)	(0.0729)	(0.0821)
English Fluency (Base level - 'Beginner')				
Fluent	0.0919***	-0.0798	0.150**	0.123
	(0.0345)	(0.0855)	(0.0680)	(0.0766)
Expert	0.109***	-0.0641	0.180**	0.0990
	(0.0399)	(0.0988)	(0.0786)	(0.0885)
Native	0.114**	-0.0654	0.146	0.0920
	(0.0466)	(0.115)	(0.0918)	(0.103)
Father's highest education (Base level - '0-10th std')				
11-12th std	-0.0240	-0.0228	-0.0967	-0.125
	(0.0448)	(0.111)	(0.0883)	(0.0995)
Diploma	0.0454	-0.000383	0.168	-0.134
	(0.0886)	(0.219)	(0.174)	(0.196)
Graduation	0.0242	-0.0900	-0.110	-0.146
	(0.0408)	(0.101)	(0.0804)	(0.0905)
Post-Graduation	0.0139	0.0457	-0.111	-0.144
	(0.0459)	(0.114)	(0.0904)	(0.102)
Mother's highest education (Base level - '0-10th std')				

VARIABLES	Relationships	Dating	PerGender	PerReligion
11-12th std	0.0368	0.110	-0.0409	0.0448
	(0.0382)	(0.0945)	(0.0752)	(0.0847)
Graduation	0.00552	0.000165	0.0276	0.0715
	(0.0383)	(0.0949)	(0.0755)	(0.0850)
Post-Graduation	0.0107	-0.0190	0.0265	0.111
	(0.0423)	(0.105)	(0.0833)	(0.0938)
Annual family income (Base level - 'below 2 lpa')				
2-5 lpa	0.0248	0.00123	0.147**	0.177**
	(0.0353)	(0.0874)	(0.0695)	(0.0783)
5-10 lpa	0.0209	-0.0257	0.207***	0.258***
	(0.0368)	(0.0910)	(0.0724)	(0.0815)
10-15 lpa	0.0237	-0.00584	0.109	0.163*
	(0.0397)	(0.0983)	(0.0782)	(0.0881)
15-25 lpa	0.0262	-0.0444	0.216***	0.262***
	(0.0410)	(0.101)	(0.0807)	(0.0909)
Above 25 lpa	-0.0266	0.0358	0.187**	0.270***
	(0.0423)	(0.105)	(0.0833)	(0.0938)
Number of siblings	-0.00861	0.0157	-0.0325	-0.0262
	(0.0118)	(0.0291)	(0.0232)	(0.0261)
Nature of family (Base nature - 'Joint')				
Nuclear	0.0184	0.0474	-0.0218	-0.00573
	(0.0227)	(0.0562)	(0.0447)	(0.0503)
Professional experience (Base Years - '0-1 years')				
1-3 years	0.0325	0.0224	0.0157	-0.0379
	(0.0256)	(0.0635)	(0.0505)	(0.0569)
3-5 years	0.0448	0.331***	0.128	0.0637
	(0.0500)	(0.124)	(0.0984)	(0.111)
Above 5 years	0.0233	0.341	-0.177	-0.137
	(0.115)	(0.285)	(0.227)	(0.256)
Constant	0.996***	0.661	0.696**	0.208
	(0.179)	(0.444)	(0.353)	(0.398)
Observations	460	460	460	460
R-squared	0.096	0.100	0.125	0.087
Standard errors in parentheses				
***** p<0.01, ** p<0.05, * p<0.1**				

Table 5: *Linear regression to study social outcomes*

It has been observed from Table 5 that age at which internet was first accessed, number of devices used, native city, fluency in English and annual family income significantly affects the tangible social outcomes on using the internet. Thus, it can be seen that social inequalities are reinforcing the digital inequalities, which needs to be targeted effectively.

Table 6 represents the questions that have asked from the respondents to understand the tangible recreational outcomes that they gain from their internet access. Recreational outcome refers to the recreational (leisure-time) benefits accrued to the respondent in the real world by virtue of their usage of internet.

S.No.	Questions	Label used
1	How often do online resources help you in achieving your fitness goals?	Fitness
2	How often do online entertainments platforms make you feel happier?	Happiness
3	How often do you find internet helpful in becoming a member of a hobby or leisure club? (otherwise inaccessible)	Hobby

Table 6: *Questions in the survey to assess recreational outcomes*

When the linear regression is performed against the variables we obtain the results as depicted in Table 7.

VARIABLES	Fitness	Happiness	Hobby
Age (Base age - 'Below 18')			
18-21	-0.0155	-0.0107	-0.0404
	(0.145)	(0.0395)	(0.135)
21-25	-0.00776	-0.00141	-0.0107
	(0.146)	(0.0396)	(0.135)
Above 25	0.00187	0.00390	-0.0286
	(0.157)	(0.0426)	(0.146)
Gender (Base gender - 'Male')			
Female	-0.0133	0.00641	0.0172
	(0.0364)	(0.00990)	(0.0338)
Others	0.133	-0.532***	-0.000907
	(0.285)	(0.0775)	(0.265)
Age at which Internet was first accessed	-0.00830	-0.00113	-0.000627
	(0.00593)	(0.00161)	(0.00551)
Total number of devices used	0.00825	0.000575	0.00636
	(0.0166)	(0.00451)	(0.0154)
Category (Base category - 'ST')			
SC	0.435	-0.0393	0.457*
	(0.291)	(0.0791)	(0.271)
OBC	0.379	-0.0609	0.483*
	(0.274)	(0.0746)	(0.255)
General	0.294	-0.0446	0.447*
	(0.272)	(0.0739)	(0.253)
Native city (Base type - 'Tier 1')			
Tier 2	0.0711	0.0332*	0.0258
	(0.0675)	(0.0184)	(0.0628)
Tier 3	0.00402	0.0229	0.0310
	(0.0714)	(0.0194)	(0.0664)
Non-Urban area	0.0515	0.0229	0.0711
	(0.0687)	(0.0187)	(0.0638)

VARIABLES	Fitness	Happiness	Hobby
English Fluency (Base level - 'Beginner')			
Fluent	0.115*	-0.0102	0.131**
	(0.0640)	(0.0174)	(0.0595)
Expert	0.0343	-0.0268	0.123*
	(0.0740)	(0.0201)	(0.0688)
Native	0.122	-0.0147	0.114
	(0.0864)	(0.0235)	(0.0804)
Father's highest education (Base level - '0-10th std')			
11-12th std	0.0259	-0.00148	0.0638
	(0.0831)	(0.0226)	(0.0773)
Diploma	0.188	0.0331	0.152
	(0.164)	(0.0446)	(0.153)
Graduation	0.105	0.0279	-0.00433
	(0.0757)	(0.0206)	(0.0703)
Post-Graduation	0.0375	0.0480**	0.0484
	(0.0851)	(0.0231)	(0.0791)
Mother's highest education (Base level - '0-10th std')			
11-12th std	-0.00692	-0.00414	0.0281
	(0.0708)	(0.0192)	(0.0658)
Graduation	-0.0241	-0.0183	0.0635
	(0.0711)	(0.0193)	(0.0661)
Post-Graduation	-0.000137	-0.0182	0.117
	(0.0784)	(0.0213)	(0.0729)
Annual family income (Base level - 'below 2 lpa')			
2-5 lpa	0.0327	0.00569	0.0541
	(0.0655)	(0.0178)	(0.0609)
5-10 lpa	0.0186	-0.0171	0.0722
	(0.0682)	(0.0185)	(0.0634)
10-15 lpa	0.0313	-0.0195	-0.114*
	(0.0736)	(0.0200)	(0.0685)
15-25 lpa	0.0674	-0.00831	-0.0161
	(0.0759)	(0.0206)	(0.0706)
Above 25 lpa	0.105	-0.0145	-0.0257
	(0.0784)	(0.0213)	(0.0729)
Number of siblings	0.000232	0.000123	0.0123
	(0.0218)	(0.00593)	(0.0203)
Nature of family (Base nature - 'Joint')			
Nuclear	0.0248	-0.0112	0.0165
	(0.0420)	(0.0114)	(0.0391)
Professional experience (Base Years - '0-1 years')			
1-3 years	0.0675	-0.00422	-0.0266
	(0.0475)	(0.0129)	(0.0442)
3-5 years	0.153	0.00992	0.0476
	(0.0926)	(0.0252)	(0.0861)
Above 5 years	0.0873	0.134**	0.114
	(0.214)	(0.0581)	(0.199)
Constant	0.387	1.040***	0.170

VARIABLES	Fitness	Happiness	Hobby
	(0.333)	(0.0904)	(0.309)
Observations	460	460	460
R-squared	0.078	0.154	0.075
Standard errors in parentheses			

***** p<0.01, ** p<0.05, * p<0.1**

Table 7: *Linear regression to study recreational outcomes*

It has been observed that native city, fluency in English and the number of years of professional experience are key variables which influence the recreational outcomes.

Table 8 represents the questions that have asked from the respondents to understand the tangible technological outcomes that they gain from their internet access. Technological outcome refers to the technological benefits accrued to the respondent in the real world by virtue of their usage of internet.

S.No.	Questions	Label used
1	How often do you use government services online?	GovServices
2	How often do you update anti-virus or operating system?	AntiVirus
3	How often do you use VPNs to access blocked sites or to mask your IP address?	VPN
4	How often do you use internet to seek medical opinion from a doctor?	Medical

Table 8: *Questions in the survey to assess technological outcomes*

When linear regression is performed against the variables the results are as in Table 9.

VARIABLES	GovServices	AntiVirus	VPN	Medical
Age (Base age - 'Below 18')				
18-21	-0.107	-0.175	-0.0168	-0.0262
	(0.0886)	(0.185)	(0.114)	(0.187)
21-25	-0.0782	-0.153	-0.0575	-0.0744
	(0.0888)	(0.186)	(0.114)	(0.188)
Above 25	-0.0771	-0.252	-0.0980	-0.00326
	(0.0957)	(0.200)	(0.123)	(0.202)
Gender (Base gender - 'Male')				
Female	-0.0580***	-0.239***	0.00543	0.0481
	(0.0222)	(0.0465)	(0.0286)	(0.0469)
Others	-0.0660	0.195	0.0175	-0.323
	(0.174)	(0.364)	(0.224)	(0.367)
Age at which Internet was first accessed	-0.000891	-0.0137*	0.00348	-0.00487
	(0.00362)	(0.00757)	(0.00465)	(0.00763)
Total number of devices used	0.00362	0.0687***	0.00181	0.00537
	(0.0101)	(0.0212)	(0.0130)	(0.0214)
Category (Base category - 'ST')				
SC	-0.178	0.164	-0.224	0.671*

VARIABLES	GovServices	AntiVirus	VPN	Medical
	(0.178)	(0.371)	(0.228)	(0.375)
OBC	0.00434	0.251	-0.0618	0.647*
	(0.167)	(0.350)	(0.215)	(0.353)
General	-0.0355	0.230	-0.167	0.583*
	(0.166)	(0.347)	(0.213)	(0.350)
Native city (Base type - 'Tier 1')				
Tier 2	0.00914	-0.0465	-0.0304	-0.0882
	(0.0412)	(0.0862)	(0.0530)	(0.0870)
Tier 3	0.0549	-0.123	0.0179	-0.110
	(0.0436)	(0.0911)	(0.0560)	(0.0920)
Non-Urban area	0.0191	-0.0902	0.0170	0.0502
	(0.0419)	(0.0876)	(0.0539)	(0.0884)
English Fluency (Base level - 'Beginner')				
Fluent	0.111***	0.0470	0.113**	-0.0398
	(0.0391)	(0.0817)	(0.0502)	(0.0824)
Expert	0.0820*	0.0145	0.0763	-0.152
	(0.0451)	(0.0944)	(0.0581)	(0.0953)
Native	0.0803	0.119	0.0710	-0.172
	(0.0527)	(0.110)	(0.0678)	(0.111)
Father's highest education (Base level - '0-10th std')				
11-12th std	0.0314	0.0566	0.0624	-0.0299
	(0.0507)	(0.106)	(0.0652)	(0.107)
Diploma	0.0758	-0.196	0.184	0.122
	(0.100)	(0.210)	(0.129)	(0.211)
Graduation	-0.00267	0.0934	0.104*	-0.0620
	(0.0462)	(0.0966)	(0.0594)	(0.0974)
Post-Graduation	0.0381	0.182*	0.131*	-0.0378
	(0.0519)	(0.109)	(0.0668)	(0.110)
Mother's highest education (Base level - '0-10th std')				
11-12th std	0.108**	0.0482	0.0800	0.161*
	(0.0432)	(0.0903)	(0.0555)	(0.0911)
Graduation	0.0668	-0.0447	0.0766	0.128
	(0.0434)	(0.0907)	(0.0558)	(0.0915)
Post-Graduation	0.0955**	0.000771	0.0703	0.132
	(0.0478)	(0.100)	(0.0615)	(0.101)
Annual family income (Base level - 'below 2 lpa')				
2-5 lpa	0.0348	-0.0243	0.0334	0.185**
	(0.0399)	(0.0836)	(0.0514)	(0.0843)
5-10 lpa	0.00144	-0.110	0.0399	0.138
	(0.0416)	(0.0870)	(0.0535)	(0.0878)
10-15 lpa	0.0328	-0.156*	0.00278	0.175*
	(0.0449)	(0.0940)	(0.0578)	(0.0948)
15-25 lpa	-0.0433	-0.214**	0.0779	0.158
	(0.0463)	(0.0969)	(0.0596)	(0.0978)

VARIABLES	GovServices	AntiVirus	VPN	Medical
Above 25 lpa	-0.00597	-0.125	0.0112	0.194*
	(0.0479)	(0.100)	(0.0615)	(0.101)
Number of siblings	0.0139	0.0148	-0.00335	-0.0231
	(0.0133)	(0.0278)	(0.0171)	(0.0281)
Nature of family (Base nature - 'Joint')				
Nuclear	0.0194	-0.0639	-0.0147	-0.0301
	(0.0257)	(0.0537)	(0.0330)	(0.0541)
Professional experience (Base Years - '0-1 years')				
1-3 years	0.0121	0.0337	-0.0127	-0.00641
	(0.0290)	(0.0607)	(0.0373)	(0.0612)
3-5 years	0.0244	-0.0879	-0.108	0.199*
	(0.0565)	(0.118)	(0.0727)	(0.119)
Above 5 years	0.0729	0.186	0.0951	0.0903
	(0.130)	(0.273)	(0.168)	(0.275)
Constant	0.874***	0.707*	0.785***	0.0673
	(0.203)	(0.424)	(0.261)	(0.428)
Observations	460	460	460	460
R-squared	0.109	0.158	0.106	0.084
Standard errors in parentheses				

***** p<0.01, ** p<0.05, * p<0.1**

Table 9: *Linear regression to study technological outcomes*

It has been observed that technological outcomes are affected very acutely by various social inequalities. It is crucial that in order to obtain tangible technological benefits several of these inequalities needs to be overcome simultaneously. From Table 9 it is clear that gender, age at which internet was first accessed, number of devices used, parental academic background, fluency in English, annual family income and number of years of professional experience significantly influence the technological outcomes on the usage of internet.

Table 10 represents the questions that have asked from the respondents to understand the tangible political outcomes that they gain from their internet access. Political outcome refers to the political benefits accrued to the respondent in the real world by virtue of their usage of internet.

S.No.	Questions	Label used
1	How often do you give online feedback to central or state governments?	GovFeedback
2	How often does your online presence influence your voting behaviour?	Voting
3	How often do you voice your political opinions on social media or blogs?	PolOpinion
4	How often does your online engagement lead you to get involved in civic engagements or online petitioning?	Civic

Table 10: *Questions in the survey to assess political outcomes*

When linear regression is performed against the variables the results are as in Table 11.

VARIABLES	GovFeedback	Voting	PolOpinion	Civic
Age (Base age - 'Below 18')				
18-21	0.0243	0.213	0.0875	-0.00646
	(0.198)	(0.173)	(0.188)	(0.176)
21-25	0.0383	0.198	0.0259	0.0260
	(0.198)	(0.173)	(0.189)	(0.176)
Above 25	-0.169	0.195	-0.0757	0.109
	(0.214)	(0.187)	(0.204)	(0.190)
Gender (Base gender - 'Male')				
Female	-0.0104	0.144***	0.0691	0.151***
	(0.0496)	(0.0434)	(0.0472)	(0.0441)
Others	-0.114	-0.220	0.215	0.189
	(0.388)	(0.340)	(0.370)	(0.345)
Age at which Internet was first accessed	0.00893	-0.00921	0.0136*	0.00208
	(0.00807)	(0.00706)	(0.00770)	(0.00718)
Total number of devices used	0.00979	0.0141	0.0165	0.0263
	(0.0226)	(0.0198)	(0.0215)	(0.0201)
Category (Base category - 'ST')				
SC	-0.349	0.188	-0.529	-0.188
	(0.396)	(0.347)	(0.378)	(0.353)
OBC	-0.356	0.230	-0.298	-0.300
	(0.374)	(0.327)	(0.356)	(0.333)
General	-0.499	0.220	-0.339	-0.367
	(0.370)	(0.324)	(0.353)	(0.329)
Native city (Base type - 'Tier 1')				
Tier 2	0.128	-0.0982	-0.0973	-0.144*
	(0.0920)	(0.0805)	(0.0877)	(0.0818)
Tier 3	0.0773	-0.0479	0.0139	-0.0751
	(0.0972)	(0.0851)	(0.0927)	(0.0865)
Non-Urban area	0.0415	0.00512	-0.00917	-0.0860
	(0.0935)	(0.0818)	(0.0891)	(0.0832)
English Fluency (Base level - 'Beginner')				
Fluent	-0.0282	0.109	0.0847	0.104
	(0.0872)	(0.0763)	(0.0831)	(0.0776)
Expert	-0.0995	0.00839	0.0325	0.0814
	(0.101)	(0.0881)	(0.0960)	(0.0896)
Native	-0.124	0.0115	0.129	0.195*
	(0.118)	(0.103)	(0.112)	(0.105)
Father's highest education (Base level - '0-10th std')				
11-12th std	0.0628	0.0409	-0.0218	0.0232
	(0.113)	(0.0990)	(0.108)	(0.101)
Diploma	-0.119	0.230	0.0413	0.0318
	(0.224)	(0.196)	(0.213)	(0.199)
Graduation	0.0622	0.0101	-0.0631	0.0548

VARIABLES	GovFeedback	Voting	PolOpinion	Civic
	(0.103)	(0.0901)	(0.0982)	(0.0917)
Post-Graduation	0.0484	0.000565	-0.100	0.0423
	(0.116)	(0.101)	(0.110)	(0.103)
Mother's highest education (Base level - '0-10th std')				
11-12th std	0.150	0.0381	0.0698	0.135
	(0.0963)	(0.0843)	(0.0919)	(0.0857)
Graduation	0.0244	-0.00640	-0.0152	0.0396
	(0.0968)	(0.0847)	(0.0923)	(0.0861)
Post-Graduation	0.109	-0.0705	0.0278	0.119
	(0.107)	(0.0934)	(0.102)	(0.0950)
Annual family income (Base level - 'below 2 lpa')				
2-5 lpa	0.120	0.0597	0.193**	0.0541
	(0.0891)	(0.0780)	(0.0850)	(0.0793)
5-10 lpa	0.0346	0.00232	0.169*	0.0902
	(0.0928)	(0.0812)	(0.0885)	(0.0826)
10-15 lpa	0.0659	0.0746	0.0508	0.0463
	(0.100)	(0.0877)	(0.0956)	(0.0892)
15-25 lpa	0.0487	0.0903	0.136	0.120
	(0.103)	(0.0905)	(0.0986)	(0.0920)
Above 25 lpa	0.110	0.0364	0.0190	0.0468
	(0.107)	(0.0934)	(0.102)	(0.0950)
Number of siblings	-0.0145	-0.00899	-0.0171	-0.0785***
	(0.0297)	(0.0260)	(0.0283)	(0.0264)
Nature of family (Base nature - 'Joint')				
Nuclear	-0.0378	0.0246	-0.0445	-0.0233
	(0.0572)	(0.0501)	(0.0546)	(0.0509)
Professional experience (Base Years - '0-1 years')				
1-3 years	-0.102	0.0765	0.0249	-0.0485
	(0.0647)	(0.0566)	(0.0617)	(0.0576)
3-5 years	0.308**	0.0653	0.188	-0.000506
	(0.126)	(0.110)	(0.120)	(0.112)
Above 5 years	0.126	0.0835	0.365	0.00848
	(0.291)	(0.254)	(0.277)	(0.259)
Constant	0.722	0.269	0.639	0.809**
	(0.453)	(0.396)	(0.432)	(0.403)
Observations	460	460	460	460
R-squared	0.079	0.074	0.083	0.140
Standard errors in parentheses				
***** p<0.01, ** p<0.05, * p<0.1**				

Table 11: *Linear regression to study political outcomes*

It can be observed from Table 11 that gender, age at which internet was first accessed, fluency in English, native city, annual family income, number of siblings and number of years of professional experience are key determinants which influence the tangible political outcomes in real life by virtue of the usage of internet.

Conclusion

This paper attempted to investigate the presence of third level digital divide among university students. The existing research showed that it is not just the digital infrastructure that determines the extent of offline benefits; it is also the social infrastructure that plays a significant role. The existing social inequalities reinforce the digital inequalities, and vice-versa. Our analysis was thus directed towards probing the role of demographic and socio-economic factors in the presence of third level digital divide. It has been indicated that the third-level digital divide exists among university students in some spheres while it was absent in others. It is clear from the study that third level digital divide is not a homogenous phenomenon and that it varies greatly. It is greatly affected not only by demographic and socio-economic factors, but also on the type of usage too. Few of the recurrent determinants of difference in offline benefits were found to be fluency in the English language, annual family income and gender. Here again the extent of influence of these variables varied differently across different type of outcomes – economic, social, technical, recreational and political – expected in the real world by virtue of the usage of the internet. It can be argued that to achieve the targets of sustainable development goals 4, 5 and 10 these inequalities needs to be overcome.

Limitations:
This research study is a novel study in the Indian context for it attempts to study the third-level digital divide among the youth. However, being an exploratory and indicative study, it has certain limitations.

Some of the limitations are discussed here. First, data points of the sample collected is not statistically random, thus, there is a possibility of bias creeping into the data collected. Second, the data collected is not representative of the sample population. The data collected does not adequately or accurately represent socio-demographics. This may lead to a positive or negative reinforcement in the results, depending on which section is over or under represented. Third, there is some tendency of over reporting by respondents while responding to the survey. Thus, we should look at the results with the caveat, that some people are cognitively prone to over-report their outcomes in binary or linear-scale questions in the survey.

Future Research:
This research study can take multiple forms moving forward. However, some of the most prominent directions are as following. First, a research study with a random and representative sample to study the digital divide among university students. Second, the results can then be tested against different other sample populations. Third, more extensive, comprehensive and focused interview studies in the future research would be more insightful and may reveal clear pictures. Fourth, based on the empirical evidences, a robust theoretical formulation can be made. Fifth, it is important to further investigate the role of gender in determining the usage and offline benefit gap. These are only some of the future directions which this research may take. In practice or reality, the scope of the study in this field and the outcomes expected are extensive. The work done through these studies shall prove ideal in guiding the public policy understanding for an equitable and innovative digital society and in achieving the sustainable development goals (SDGs).

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