Role of Virtual Learning in India's New National Education Policy, 2020: A Study of University Students' Perception

By:

***SWATI MATHUR[1], VASANTHI DONTHI [2] VAISHALI PAGARIA [3]**

[1]Assistant Professor, Institute of Public Enterprise
[2] Assistant Professor, Institute of Public Enterprise

[3] Guest Faculty, WILP BITS-Pilani
Visiting Faculty, NMIMS, Hyderabad

ABSTRACT
India has projected itself as an 'information rigorous society', especially since the past ten years, and there is an increasing necessity to welcome the application of new technology in the education sector. Showing this in action, the New Education Policy, 2020 highlights one of the fundamental changes in the present education structure, and that will be the introduction and usage of technical know-how in teaching and learning from the primary stage to the higher education, adult education, and research work stage. Diversified skill up-gradation, removing language barriers, ease of access, and quality education are some of the key factors. Hence the role of virtual learning will play a vital role in bringing a new and positive revolution in the traditional education system of India. This paper aims at studying the role of this virtual learning in the new education policy, especially from university students' point of view. Both explorative and descriptive research methodology has been used to analyze students' perception and expectation of online learning. The research finds that though online learning has given a paradigm shift to the conventional education system, university students still expect the New Education Policy, 2020 to offer higher and adult education with the blended system which includes both online and offline modes of learning to get quality education at their pace.

Key words: *Virtual learning, National Education Policy, Students' Perception*

Introduction

India has projected itself as an 'information rigorous society', especially since the past ten years, and there is an increasing necessity to welcome the application of new technology in the education sector. In this contest, the New Education Policy, 2020[1] records that the most important and essential features navigating the Indian education system will be the use of the right technology in delivering education across all the levels, making learning more effective and qualitative, education to all through easy accessibility, multi-lingual, broadcasting, and proper development and administration.

Government of India (GoI) through her digital innovation initiatives, introduced digitalization at all the levels across all the sectors of economy. This has definitely brought better productivity and timely delivery of output in various sector including education sector. The new National Education Policy, 2020 of the GoI has also focused on digital innovation and use of latest technologies like artificial intelligences (AI) to

[1] India's New Education Policy, 2021.

impart education from primary level to higher education including research and development. There is no doubt that this will bring a positive change in the system but this also calls for understanding students' expectations and perception over use of virtual learning.

Virtual learning has brought a big revolutionary change in the education system especially in the recent past. Above all, this pandemic situation of COVID-19 has given an opportunity to consolidate virtual learning with the traditional education structure. Therefore, raising question about its acceptance and student's perception is irrelevant in present scenario. However, it is a challenge to understand and meet students' perception, especially the adult students, from this new normal education structure which would be implemented with the introduction of the Policy. Hence the present study has focused on assessing university students' perception on the role of virtual learning from the Indian education system with the implementation of New Education Policy, 2020.

1. Literature Review

Application of technological know-how and digital tools are intermediaries in the learning process and creating new learning environment. As stated in their study, R. E. Navarro et al. (2011)[2], the fact that integration of technology in the learning process enable interaction and interrelation within an ongoing communication process. Thus, this is enriching the creation and modernization of present knowledge and encourage traditions and approaches within a system that is uniform to all involved in the educational process, Becerra et al. (2015).[3] Nowadays, universities, schools, and companies around the world are using digital and virtual technology-backed education applications to impart education at a different level. Web-based technologies are promoted into the courses offered, which in a way serves as complementary to the traditional physical courses. On the other hand, this new techno-based education system has helped the organizations/institutes to build important data base which they use to evaluate the course performance and students' understanding level, Valsamidisa el at. (2014).[4]

If we closely monitor, the use of virtual learning environment (VLEs) within has been given effective result and there is a great potential to be explored and experiment. New educational innovation with the participative tech-friendly society have resulted in the dynamic and multidimensional concepts in learning environments and contexts. According to Morais, Alves and Miranda (2013), [5] the key capability of online learning is the establishment of a combination of various tools which are aimed to help construction and dissemination of educational materials and the evaluation of the learning process. Keeping in mind the given peculiar features of VLE this concept highlights multiple facets of the new learning process. Among these, the most applicable features associated with virtual learning environment are scope, period, resources, and approaches. VLEs

[2] R. E. Navarro, M. J. Pacheco, Y. N. Rangel, & M. S. Montoya, (2011). Interregional research forum on virtual learning environments: Integration of academic and technological networks. México: Redtic. pp. 154–164.

[3] Becerra, E., García, M. C., & Chávez, R. (2015). Learning environment with the use of technology in initial teacher training and intellectual skills, México: Redtic. pp. 162.

[4] Valsamidisa, S., Kazanidisa, I., Petasakisa, I., Kontogiannisb, S., & Kolokithaa E., (2014). E-Learning Activity Analysis. Procedia Economics and Finance. Issue 9. pp. 511 – 518.

[5] Morais, C., Alves, P., & Miranda L., (2013). Valuing virtual learning environments by higher education teachers. In Á. Rocha, L. Reis, M. Cota, M. Painho, & M. Neto (Eds.), Information Systems and Technologies. 8th Iberian Conference on Information Systems and Technologies. Lisbon: AISTI/ISEGI. pp. 289-294.

deliver organizations with remarkable amounts of information and the opportunity with an assurance of worthiness and legitimacy.

Dahlstrom, Brooks, and Bichsel (2014)[6] in their study on virtual learning environment in higher education concluded that among the surveyed group, virtual training is used by 83% students; 56% students replied that they use virtual learning in most of their courses; 74% of teachers say that virtual learnings are a very useful tool to the enhancement of teaching; 71% of teachers say that virtual learnings are a very useful tool for learning up-gradation; 99% of establishments use a VEL; 85% of teachers surveyed use VL; and 56% of teachers use it regularly almost daily.

As concluded by Alves et al. (2017)[7], the virtual learning elements and techniques are most appreciated by the maximum numbers (percentage) of educators. They use this mostly for students registers, messages, diaries, notices, or as mentor books. Further, it was also observed that the virtual environment features which are given the most importance by the teachers were its ease to use, better connectivity, timely availability, well designed LMS, compatibility with MS Office and Windows, etc. Also, the features maximum rated by educationists with reference to the use of information and communication technology (ICT) were the availability and accessibility of virtual information and material which they can directly browse as and when required and which also helps in giving real time examples of the theory. Of course, they agreed on the fact that due to the virtual contact, they are losing direct physical communication with the students and hence the connectivity with the students is degrading, Siemens, G., & Gašević, D. (2012). [8] In their study, Agudo-Peregrina et al. (2018) [9] have also validated that knowledge sharing in virtual classroom is difficult as the instructor has to continuously motivate the students to participate in the topic discussed, but with the help of creating appropriate virtual learning environment this challenge can be eased by showing live videos, related sites, etc.

From the perspective of teaching methodology adopted, virtual learning implemented in various knowledge imparting educational organisation has upgraded the present education sector especially the novelty it has brought in the pedagogy. Efforts are now put to make this virtual environment more student centric and innovative as far as teaching pedagogy is concerned. Previous study on virtual learning reveals benefits and critical areas of use of technology in imparting education. It also reveals that integration of technology with the conventional education process is the need of the hour. Therefore, Government of India, with the objective of bringing virtual leaning benefits to the traditional education process, has designed the New Education Policy, 2020. The following section will discuss key features of the Policy especially highlighting the integration of technology for brining advancement in the present education system.

---

[6] Dahlstrom, E., Brooks, C., & Bichsel J. (2014). The Current Ecosystem of Learning Management Systems in Higher Education: Student, Faculty, and IT Perspectives. Research report. Louisville, CO: ECAR. Available online: http://www.educause.edu/ecar

[7] Alves, P., Miranda, L., & Morais, C. (2017), Open Educational Resources: Higher Education Students' Knowledge and use. In Rikke Ørngreen & Karin Tweddell Levinsen (Eds.), Proceedings of the 15th European Conference on e-learnig ECEL. Reading, UK: Academic Conferences and Publishing International Limited. pp. 11- 18.

[8] Siemens, G., & Gašević, D. (2012). Guest Editorial - Learning and Knowledge Analytics. Educational Technology & Society 2012. 15(3). pp. 1-2.

[9] Agudo-Peregrina, A., Iglesias-Pradas, S., Conde-González, M., & Hernández-García A. (2018). Can we predict success from log data in VLEs? pp. 542–550.

India's New Education Policy, 2020[10]

The new National Education Policy, 2020 is revolutionary in every sense. An essential string that waves through the Policy is the integration of teaching and technical know-how. It mainly highlights the emphasis on the numerous aspects such as the necessity of early childhood care, complete education, updating and modernisation of the current curriculum. The new National Education Policy 2019 is drafted by the Committee for Draft National Education Policy under the chairmanship of Dr. K. Kasturirangan, former chairman of the Indian Space Research Organisation (ISRO). The Policy is focusing on four-parts which covers school education (Part I); higher education (Part II); other key areas of focus (Part III) and making it happen (Part IV). Below discussed are some of the important aspects of the Policy where digital technology will play a major role in all these four parts.

Part I: School Education: The New Education Policy identified the role of technology in assisting educators (teachers), filling the language barrier, building digital libraries, re-emphasising and encouraging language learning as well as ensuring greater access to education including differently-abled children. The Policy also proposed that coding should be introduced in school syllabuses as a significant skill that students must develop. The Policy also underlined that technology, especially digital technology, can be an effective tool in facilitating upskilling teachers 'skills and hence encourages utilisation of technology platforms for online teacher-training.

Part II & II: Higher Education & Adult Education: The Policy has introduced a need to introduce and apply technological know-how in professional education. Further, using technology to speed up government's campaign of full literacy is also introduced. The Policy understands importance of technology in support it by addressing several societal challenges and follows to endorse multidisciplinary, interdisciplinary research and innovation. To illustrate, Higher Education Institutions ("HEIs") have been supported to set up start-up incubation centres and technology development centres, and to cultivate a culture of research, a National Research Foundation is also proposed to be set up. The Policy foresees formation of the National Educational Technology Forum (NETF), which shall act as an important platform wherein schools and higher education institutions can get information on the application of technological know-how in the on-going education systems, and also make them understand how this technology can enhance learning, evaluation, planning and administration of the educational institutes.

Part IV: Management of Education: The New Education Policy has interestingly focus on the technology application for ensuring and safeguarding efficiency and transparency of various state level and central level regulatory organizations eg. SSCA and HEC of India. Another progressive step introduced by the Policy is setting up of the Academic Bank of Credit (ABC). This bank is a unique concept that will act as a virtual store of all academic credit earn over a period of time from different state higher education institutes across the nation.

Apart from these, the Policy[11] also recognises challenges arising in adapting to artificial intelligence. To take care this challenged, it has made NETF responsible to identify and categorize various technological inventions, their potentiality of upscaling and the time required to develop the same. NEFT are supposed to report the same to the Ministry of

[10] https://www.education.gov.in/sites/upload_files/mhrd/files/NEP/.pdf

[11] https://www.bloombergquint.com/opinion/nep-2020-an-interplay-of-education-and-technology

Human Resource Development which is an authority to formally authorized these technologies to be implemented in the education system. Along with this under the flag of *Digital India,* the policy has proposed remarkable investment in setting up of virtual learning appropriate infrastructure, creating e-learning space and tools, setting up of digital laboratories, virtual resources, training to teachers for creating online teaching appropriate education material, effective LMS, etc.

New Education Policy draft has introduced amid COVID 19 when the entire world and its economy has shifted to the virtual world and the education sector of the economy is not an exception. In fact, the one has seen the revolutionary change in the education process and also challenges associated with it. Indeed, it is a new experience for all involved in the process. Looking at the advantages virtual learning environment carries and the GoI's initiative of stringing information and communication technology (ICT) with traditional education system, it is indeed become very important to study students' perception on the role of virtual learning in the Policy. Further to boost and encourage the education sector and virtual learning the GoI has increased its provision of spending in this sector by 6.6% closely Rs.9000 crores in the Union budget 2022-23 then compare to the previous year.[12] This increase is mainly in the Department of School Education and Literacy.

2. Research Objectives:

The main objective of this research is to understand and measure university students' perception on role of virtual learning in the new National Education Policy, 2020. The specific objectives are

a. To study new National Education Policy, 2020
b. To understand impact of virtual learnings in present education sector so far.
c. To measure university students' perception on virtual learnings with respect to new National Education Policy, 2020

3. Hypothesis

H1: The variable from which the sample was extracted does not follow a normal distribution.
H2: There is a correlation between students' experience and perception with virtual learning.
H3: The mean of students' perception is not equal to 3

4. Research Methodology

The study had two major modules i.e.

- Secondary survey
- Perception rating survey

In the secondary survey module, information available on the New Education Policy has been abstracted through the secondary research. Further, literature review has undertaken to understand role of virtual learning and its impact on education system. In the perception survey module, a structured self-administered questionnaire was circulated online with target respondents. The data was obtained from university going students in Hyderabad who have experience of both online and offline learning environment. the sample selection was done using purposive sampling method though the sample was spread out from undergraduate to post-graduate including certificate and diploma course students across all the universities/institutions in Hyderabad to get better representation. As it was difficult to find out the exact number of university students studying covering

[12] https://www.ibef.org/economy/union-budget-2022. Referred on 02/02/2022.

all courses, the population is assumed to be unknown. The sample of 385 is derived at 95% confidence level and 5% margin of error. Total 450 questionnaires were circulated of which 411 questionnaires were received and after data sorting, 397 questionnaires data have been used for the study. The survey was conducted during 1st week of October to 2nd week of December 2020.

5. Data Analysis

Data were collected using the above mentioned two modules. Data collected thought the secondary survey about the Policy and impact of virtual learning so far is analysed and presented in the literature review section. This has given a based to prepare questionnaire to conduct perception survey. Data analysis has been carried out in three parts. Part I focused on the demographic profile of the students, Part II highlights student's course details and their experience in virtual learning, and Part III measured students' perception on role of virtual learning in the Policy. This section discusses results of data analysis.

Part I: Demographic Profile (Table 1): Out of the total number of students responded 38.04% were female and 60.45% were male. 44.08% students are between the age group of 44.08%, 48.61% students were between the age group of 22-25 and 6.55% students were above 25 years of age.

Part II: Students' Course Details and Experience in Virtual Learning (Table 2 & 3): Out of total 397 students, 253(63.73%) students are enrolled in post graduate courses in different universities/institutes of Hyderabad. 51.64% of the students are in their final year of the course. All most all students are having experience of virtual learning and more than 50% of the students are imparting online education since more than 6 months. 65% of these students are spending daily four or more than four hours on virtual learning of their respective course. This justifies their capacity to evaluate and assess role of virtual learning in the present education. Further these students are having experience of both conventional and digital method of education so they are believed to be the right set of respondents for the study.

Part III: Students' Perception on Role of Virtual Learning in the New Education Policy, 2020:

Reliability *Coefficient*

After data collection, researcher has checked the internal reliability of data through Cronbach's alpha. The overall Cronbach's alpha of the data for responses from students is 0.957 which is very high.

Normality Test (Table 4)

This part of the analysis starts by assessing whether the number of students assessed to the role of virtual learning is related to the variables regarding students' perception from the virtual learning in the Policy by using the appropriate correlation coefficients. In order to assess whether the variables under study have a normal distribution or not, the SPSS program for the normality test have been used. Table 4 shows the results derived from the normality test on the data.

Correlation Test (Table 5)

Based on the result presented in Table 4 and taking a null hypothesis for each of the variables that "The variable from which the sample was extracted follows a normal distribution", one can observe that the null hypothesis must be rejected, based on the level of significance found.

That means, the data does not follow normal distribution. Hence, we must use Spearman correlation coefficient to find and analyse relation between various variables related to the perception of students towards virtual learning in the new education policy. Based on the correlation calculation, correlation between the variables is significant at alpha = 0.05 level. From this, we can infer that the higher the no. of students access to the virtual

learning, better is their understanding and perception on the role of virtual learning in the Policy.

Analysis of Perception (Table 6)

For each of the hypothesized 30 statements, the 'mean', 'standard deviation' and 't-statistic' have been calculated. The mean value of all the 30 statements is high ranging between (3.126-4.438) on a scale of 1-5 except statement 24 and 34. This is a clear indication that these statements are important to access students' perception. The standard deviations for the 30 statements are high (more than 1) but as the normality test indicates that the data does not follow normal distribution, this will not affect the analysis.

Finally, for each of the statement the 't value' (higher-tailed) is calculated which statistically significant. Therefore, we conclude that each of the statements is individually significantly influencing student's perception on the role of virtual learning in the Policy. We conclude that the joint influence of all the 30 statements together is statistically significant. Hence it can be concluded that the null hypotheses "the mean is equal to 3" must be rejected. That means mean is not equal to 3. Here one can observe that statement no. 17 (VL helps in reducing the cost of education) and 18 (VL increases employment opportunities for university students) are having p-values higher than the significant level. Hence, we can infer that students' expectation with the introduction of virtual learning in the Policy with reference to reduction in cost and increase in employment opportunities are least.

6. Conclusion

The objective of the study was to measure university students' perception on role of virtual learning in the New Education Policy, 2020. From the study, it can be concluded that university students have a significant amount of experience of imparting education through virtual learning environments to assess the role of virtual learning in the education system. It has been found that irrespective of the type, of course, the students have been enrolled with their respective university, all most the students have agreed on the ease of learning with the introduction of virtual learning especially in a pandemic situation like COVID-19. At the same time, they are not denying on the benefits of conventional learning. The idea of bringing digital technology in the present education system will be appreciated and welcomed by the university students. Looking at the mean value of the statement (3.882) 'use of blended learning (both physical and virtual) will be more effective to impart quality education under India's new education policy, 2020', we can conclude that though online learning has given a paradigm shift to the conventional education system, university students still expect the Policy to offer higher and adult education with the blended system which includes both online and off-line mode of learning to get quality education at their pace.

7. Scope for Further Research

The present study was restricted to study only university students' perception on virtual learning and its role in the new National Education Policy, 2020 with the geographic boundary of Hyderabad only. The same study can be conducted in universities and professional education institutes other states or cities of India. Further, the study can also be taken to the measure perception of school going students across the states of India.

8. References:

9.1 Journal Article

1. *Agudo-Peregrina, A., Iglesias-Pradas, S., Conde-González, M., & Hernández-García A. (2018). Can we predict success from log data in VLEs? - Classification of interactions for learning analytics and their relation with performance in VLE-supported F2F and online learning. Computers in Human Behavior. pp. 542–550.*

2. *Alves, P., Miranda, L., & Morais, C. (2017), Open Educational Resources: Higher Education Students' Knowledge and use. In Rikke Ørngreen & Karin Tweddell Levinsen (Eds.), Proceedings of the 15th European Conference on e-learnig ECEL. Reading, UK: Academic Conferences and Publishing International Limited. pp. 11- 18.*

9.2 Reports

1. *Becerra, E., García, M. C., & Chávez, R. (2015). Learning environment with the use of technology in initial teacher training and intellectual skills, México: Redtic. pp. 162.*
2. *Dahlstrom, E., Brooks, C., & Bichsel J. (2014). The Current Ecosystem of Learning Management Systems in Higher Education: Student, Faculty, and IT Perspectives. Research report. Louisville, CO: ECAR. Available online: http://www.educause.edu/ecar*
3. *https://www.education.gov.in/sites/upload_files/mhrd/files/NEP/.pdf*
4. *Morais, C., Alves, P., & Miranda L., (2013). Valuing virtual learning environments by higher education teachers. In Á. Rocha, L. Reis, M. Cota, M. Painho, & M. Neto (Eds.), Information Systems and Technologies. 8th Iberian Conference on Information Systems and Technologies. Lisbon: AISTI/ISEGI. pp. 289-294.*
5. *R. E. Navarro, M. J. Pacheco, Y. N. Rangel, & M. S. Montoya, (2011). Interregional research forum on virtual learning environments: Integration of academic and technological networks. México: Redtic. pp. 154–164.*
6. *Siemens, G., & Gašević, D. (2012). Guest Editorial - Learning and Knowledge Analytics. Educational Technology & Society 2012. 15(3). pp. 1-2.*

Annexure Tables

Table 1: Demographic Profile (N = 397)		
Demographic Variables	**Frequency**	**Percentage (%)**
Gender		
Male	240	60.45%
Female	151	38.04%
No response	6	1.51%
Total	**397**	
Age		
18-21	175	44.08%
22-25	193	48.61%
>25	26	6.55%
No response	3	0.76%
Total	**397**	

Table 2: Student Course Details (N = 397)		
Variables	**Frequency**	**Percentage (%)**
Course/s Enrolled in		
Under graduate	41	10.33%
Diploma	6	1.51%
Graduate	66	16.62%
Post graduate	253	63.73%
Post graduate diploma	9	2.27%
Certificate course	3	0.76%
Others	10	2.52%
No response	9	2.27%
Total	**397**	**100.00%**
Year of the course in		
1st year	48	12.09%
2nd year/final year	205	51.64%
3rd year	98	24.69%
4th year/final year	43	10.83%
No response	3	0.76%
Total	**397**	**100.00%**

Table 3: Experience in Virtual Learning (N=397)		
Facility of Virtual Learning (VL) in the chosen course		
Yes	390	98.24%
No	7	1.76%
Total	**397**	**100.00%**
Experience of attending virtual classes		
Yes	375	94.46%
No	9	2.27%
No response	13	
Total	**397**	**100.00%**
Less than 6 months	196	49.37%
6 to 12 months	180	45.34%
More than 12 months	10	2.52%
No response	11	2.77%
Total	**397**	**100.00%**

Time spend per day on a virtual learning platform		
Less than one hour	14	3.53%
One hour	25	6.30%
Two hours	17	4.28%
Three hours	70	17.63%
Four hours	111	27.96%
More than four hours	149	37.53%
No response	11	2.77%
Total	**397**	**100.00%**

Table 4: Normality Test

S N	Variable\Test	Shapiro-Wilk	Anderson-Darling	Lilliefors	Jarque-Bera
1	You must require basic knowledge of a computer and the internet to attend virtual classrooms	<0.0001	<0.0001	<0.0001	<0.0001
2	VL requires good internet connectivity with the availability of sufficient data at both the end	<0.0001	<0.0001	<0.0001	<0.0001
3	The learning management system (LMS) used by your university/institute is effective for the smooth functioning of the virtual classes.	<0.0001	<0.0001	<0.0001	<0.0001
4	In the VL, maintaining discipline and control of the class is a big challenge	<0.0001	<0.0001	<0.0001	<0.0001
5	The LMS used by your university/institute takes care of virtual class control by deploying additional support to the course instructors	<0.0001	<0.0001	<0.0001	<0.0001
6	VL allows access to coursework from anywhere at any time	<0.0001	<0.0001	<0.0001	<0.0001
7	VL allows understanding the concept in a more effective way with the use of videos	<0.0001	<0.0001	<0.0001	<0.0001
8	Interactions and discussion with the instructor and fellow classmates increase with the help of chatbox options	<0.0001	<0.0001	<0.0001	<0.0001
9	Effective time management in accordance with the delivery of course content	<0.0001	<0.0001	<0.0001	<0.0001
10	Immediate feedback on the test and other course-related exams	<0.0001	<0.0001	<0.0001	0.001
11	Allows access to expert lectures beyond the geographic boundaries	<0.0001	<0.0001	<0.0001	<0.0001
12	Virtual classroom reduces physical stress	<0.0001	<0.0001	<0.0001	<0.0001
13	VL improves knowledge sharing	<0.0001	<0.0001	<0.0001	<0.0001
14	VL also helps in peer learning	<0.0001	<0.0001	<0.0001	0.000
15	Use of VL improves students' listening skills	<0.0001	<0.0001	<0.0001	<0.0001
16	VL sharpens students' digital skills	<0.0001	<0.0001	<0.0001	<0.0001
17	VL helps in reducing the cost of education	<0.0001	<0.0001	<0.0001	<0.0001
18	VL increases employment opportunities for university students	<0.0001	<0.0001	<0.0001	0.069
19	Virtual classroom is important in the present-day education system	<0.0001	<0.0001	<0.0001	<0.0001
20	Use of advanced technology like artificial intelligence (AI) has given a progressive way	<0.0001	<0.0001	<0.0001	<0.0001

	for VL				
21	Online education has opened more avenues for the students to gain multidisciplinary expertise at their convenient time and peace	<0.0001	<0.0001	<0.0001	<0.0001
22	Use of VL platform in all the courses offered by universities/institutes will allow student diversity and cross-culture learning	<0.0001	<0.0001	<0.0001	<0.0001
23	VL helps in bringing global perspective and competency in the teaching methodology	<0.0001	<0.0001	<0.0001	<0.0001
24	Compare to physical classroom education, VL education is more effective in terms of course delivery, concept clarity, use of teaching tools, interactions, and discussion	<0.0001	<0.0001	<0.0001	<0.0001
25	The use of blended learning (both physical and virtual) will be more effective to impart quality education under India's new education policy, 2020	<0.0001	<0.0001	<0.0001	<0.0001
26	Digital infrastructure plays a very important role in achieving objectives of India's new education policy, 2020	<0.0001	<0.0001	<0.0001	<0.0001
27	Digital education embedding in the regular curriculum at all levels one of the prime conditions to achieve objectives of India's new education policy, 2020	<0.0001	<0.0001	<0.0001	<0.0001
28	Monetary aid to students from the government to set up a virtual learning environment will boost students' morale to take up courses offered by the university/institutes	<0.0001	<0.0001	<0.0001	<0.0001
29	The introduction of VL will help students to get international exposure at their respective Universities/Institutes	<0.0001	<0.0001	<0.0001	<0.0001
30	VL will boost research activities at the university/institute level	<0.0001	<0.0001	<0.0001	<0.0001

ISSN No: 0932-4747

Variables	10	5	6	14	11	12	16	30	31	32	33	36	37	38	39	40	35	21	27	34	22	24	28	17	25	26
10	1	0.115	0.097	0.086	-0.050	-0.043	0.053	0.015	0.063	0.034	-0.025	0.084	0.036	0.007	0.021	0.017	0.089	-0.030	0.093	0.076	0.091	0.045	0.137	0.097	-0.007	0.027
5	0.115	1	-0.521	0.077	0.114	0.067	0.033	0.015	-0.048	-0.026	-0.063	-0.013	0.029	-0.011	-0.056	0.122	0.126	0.011	0.085	-0.062	0.136	-0.020	0.048	-0.026	-0.102	0.045
6	0.097	-0.521	1	-0.040	-0.235	-0.220	-0.051	0.030	0.125	0.044	0.051	-0.097	0.041	-0.016	-0.038	-0.055	-0.101	-0.088	-0.010	0.148	0.250	0.140	0.161	0.052	0.088	-0.039
14	0.086	0.077	-0.040	1	0.355	0.203	0.238	0.273	0.160	0.222	0.191	0.158	0.127	0.155	0.115	0.247	0.317	0.245	0.182	0.063	0.157	0.158	0.098	0.235	0.074	0.100
11	-0.050	0.114	-0.235	0.355	1	0.468	0.309	0.303	0.166	0.192	0.182	0.214	0.201	0.258	0.215	0.197	0.289	0.280	0.091	0.002	0.013	0.158	-0.007	0.073	0.159	0.278
12	-0.043	0.067	-0.220	0.203	0.468	1	0.362	0.367	0.242	0.260	0.216	0.238	0.186	0.237	0.197	0.153	0.305	0.247	-0.024	-0.105	-0.002	0.136	-0.057	0.146	0.134	0.147
16	0.053	0.033	-0.051	0.238	0.309	0.362	1	0.559	0.489	0.494	0.461	0.373	0.350	0.318	0.417	0.403	0.316	0.453	0.345	0.247	0.267	0.280	0.331	0.348	0.347	0.339
30	0.015	-0.015	0.030	0.273	0.303	0.367	0.559	1	0.617	0.576	0.494	0.425	0.500	0.443	0.491	0.497	0.497	0.484	0.372	0.278	0.275	0.343	0.407	0.486	0.428	0.433
31	0.063	-0.048	0.125	0.160	0.166	0.242	0.489	0.617	1	0.688	0.606	0.419	0.525	0.509	0.496	0.490	0.436	0.485	0.435	0.455	0.456	0.448	0.516	0.557	0.554	0.540
32	0.034	-0.026	0.044	0.222	0.192	0.260	0.494	0.576	0.688	1	0.633	0.386	0.376	0.406	0.491	0.479	0.396	0.510	0.399	0.474	0.340	0.408	0.482	0.517	0.506	0.482
33	-0.025	-0.063	0.051	0.191	0.182	0.216	0.461	0.494	0.606	0.633	1	0.550	0.452	0.491	0.478	0.478	0.451	0.458	0.332	0.535	0.421	0.459	0.441	0.518	0.477	0.459
36	0.084	-0.013	-0.097	0.158	0.214	0.238	0.373	0.425	0.419	0.386	0.550	1	0.658	0.606	0.532	0.442	0.515	0.486	0.176	0.388	0.297	0.296	0.221	0.405	0.410	0.435
37	0.036	-0.029	0.041	0.127	0.201	0.186	0.350	0.500	0.525	0.376	0.452	0.658	1	0.664	0.516	0.496	0.475	0.571	0.353	0.376	0.347	0.330	0.285	0.406	0.428	0.402
38	0.007	-0.011	-0.016	0.155	0.258	0.237	0.318	0.443	0.509	0.406	0.491	0.606	0.664	1	0.696	0.614	0.593	0.601	0.285	0.322	0.273	0.240	0.269	0.335	0.384	0.448
39	0.021	-0.056	-0.038	0.115	0.215	0.197	0.417	0.491	0.496	0.491	0.478	0.532	0.516	0.696	1	0.736	0.502	0.558	0.321	0.371	0.301	0.307	0.318	0.439	0.466	0.463
40	0.017	0.122	-0.055	0.247	0.197	0.153	0.403	0.497	0.490	0.479	0.478	0.442	0.496	0.614	0.736	1	0.464	0.446	0.413	0.407	0.368	0.399	0.464	0.539	0.460	0.469
35	0.089	0.126	-0.101	0.317	0.289	0.305	0.316	0.497	0.436	0.396	0.451	0.515	0.475	0.593	0.502	0.464	1	0.450	0.167	0.222	0.205	0.202	0.248	0.344	0.252	0.432
21	-0.030	0.011	-0.088	0.245	0.280	0.247	0.453	0.484	0.485	0.510	0.458	0.486	0.571	0.601	0.558	0.446	0.450	1	0.438	0.288	0.320	0.404	0.267	0.380	0.443	0.492
27	0.093	0.085	-0.010	0.182	0.091	-0.024	0.345	0.372	0.435	0.399	0.332	0.176	0.353	0.285	0.321	0.413	0.167	0.438	1	0.391	0.490	0.444	0.554	0.475	0.458	0.439
34	0.076	-0.062	0.148	0.063	0.002	-0.105	0.247	0.278	0.455	0.474	0.535	0.388	0.376	0.322	0.371	0.407	0.222	0.288	0.391	1	0.504	0.430	0.569	0.477	0.490	0.344
22	0.091	-0.136	0.250	0.157	0.013	-0.002	0.267	0.275	0.456	0.340	0.421	0.297	0.347	0.273	0.301	0.368	0.205	0.320	0.490	0.504	1	0.603	0.598	0.522	0.448	0.333
24	0.045	-0.020	0.140	0.158	0.158	0.136	0.280	0.343	0.448	0.408	0.459	0.296	0.330	0.240	0.307	0.399	0.202	0.404	0.444	0.430	0.603	1	0.546	0.578	0.539	0.568
28	0.137	0.048	0.161	0.098	-0.007	-0.057	0.331	0.407	0.516	0.482	0.441	0.221	0.285	0.269	0.318	0.464	0.248	0.267	0.554	0.569	0.598	0.546	1	0.657	0.574	0.472
17	0.097	-0.026	0.052	0.235	0.073	0.146	0.348	0.486	0.557	0.517	0.518	0.405	0.406	0.335	0.439	0.539	0.344	0.380	0.475	0.477	0.522	0.578	0.657	1	0.659	0.548
25	-0.007	-0.102	0.088	0.074	0.159	0.134	0.347	0.428	0.554	0.506	0.477	0.410	0.428	0.384	0.466	0.460	0.252	0.443	0.458	0.490	0.448	0.539	0.574	0.659	1	0.625
26	0.027	0.045	-0.039	0.100	0.278	0.147	0.339	0.433	0.540	0.482	0.459	0.435	0.402	0.448	0.463	0.469	0.432	0.492	0.439	0.344	0.333	0.568	0.472	0.548	0.625	1
18	0.008	0.051	0.010	0.187	0.122	0.217	0.386	0.468	0.452	0.566	0.527	0.423	0.467	0.400	0.466	0.525	0.365	0.438	0.456	0.418	0.484	0.567	0.493	0.592	0.555	0.590
29	0.041	-0.053	0.142	0.152	0.103	0.132	0.439	0.630	0.631	0.603	0.622	0.454	0.447	0.392	0.375	0.469	0.373	0.382	0.480	0.480	0.505	0.572	0.615	0.595	0.607	0.530
23	0.071	0.051	0.129	0.096	0.011	0.018	0.298	0.375	0.511	0.531	0.492	0.326	0.397	0.397	0.386	0.495	0.395	0.431	0.532	0.478	0.551	0.634	0.642	0.560	0.591	0.527
19	0.068	0.101	0.149	0.149	0.081	0.086	0.297	0.445	0.453	0.542	0.452	0.333	0.362	0.333	0.423	0.399	0.374	0.349	0.422	0.497	0.351	0.446	0.577	0.560	0.576	0.530
20	-0.006	0.110	-0.113	0.212	0.191	0.174	0.373	0.416	0.417	0.437	0.332	0.322	0.377	0.371	0.480	0.459	0.324	0.487	0.502	0.369	0.343	0.427	0.487	0.547	0.536	0.575
15	0.040	-0.024	-0.036	0.226	0.357	0.272	0.276	0.313	0.276	0.294	0.289	0.348	0.364	0.330	0.304	0.305	0.257	0.278	0.181	0.285	0.290	0.287	0.341	0.347	0.391	0.353
13	0.088	0.080	-0.079	0.203	0.278	0.264	0.281	0.383	0.324	0.380	0.294	0.253	0.305	0.399	0.370	0.375	0.412	0.303	0.214	0.228	0.195	0.265	0.261	0.282	0.238	0.319
8	-0.043	0.090	-0.078	-0.014	-0.062	-0.066	-0.082	-0.088	-0.070	-0.089	-0.058	-0.095	-0.047	-0.106	-0.082	-0.094	-0.109	-0.075	-0.053	-0.030	-0.011	-0.013	-0.011	-0.019	-0.074	-0.140
7	-0.157	-0.026	-0.030	-0.084	-0.046	-0.098	-0.132	-0.070	-0.007	-0.094	-0.018	-0.084	-0.026	-0.071	-0.063	-0.051	-0.093	-0.027	-0.044	-0.027	-0.051	-0.067	-0.022	-0.012	-0.029	-0.029
9	-0.056	-0.049	-0.097	-0.007	-0.026	-0.067	-0.093	-0.039	-0.103	-0.031	-0.003	-0.108	-0.085	-0.108	-0.000	-0.047	-0.142	-0.081	-0.048	-0.109	-0.190	-0.109	-0.142	-0.222	-0.144	-0.104

The correlation is significant at level 0.05

Table 6: One-Sample Test

One-sample t-test (upper tailed) (N = 397)

Test Value = 3, Degree of Freedom (*df*) = 396, α = 0.05

SN	Variable	Mean	Std. deviation	t (Observed Value)
1	You must require basic knowledge of a computer and the internet to attend virtual classrooms	4.116	1.109	20.056
2	VL requires good internet connectivity with the availability of sufficient data at both the end	4.438	1.042	27.510
3	The learning management system (LMS) used by your university/institute is effective for the smooth functioning of the virtual classes.	3.864	1.086	15.857
4	In the VL, maintaining discipline and control of the class is a big challenge	3.534	1.232	8.638
5	The LMS used by your university/institute takes care of virtual class control by deploying additional support to the course instructors	3.370	1.183	6.234
6	VL allows access to coursework from anywhere at any time	3.831	1.263	13.113
7	VL allows understanding the concept in a more effective way with the use of videos	3.338	1.411	4.765
8	Interactions and discussion with the instructor and fellow classmates increase with the help of chatbox options	3.302	1.325	4.54374
9	Effective time management in accordance with the delivery of course content	3.365	1.277	5.69758
10	Immediate feedback on the test and other course-related exams	3.252	1.338	3.75135
11	Allows access to expert lectures beyond the geographic boundaries	3.690	1.284	10.7098
12	Virtual classroom reduces physical stress	3.126	1.511	1.66115
13	VL improves knowledge sharing	3.267	1.370	3.88204
14	VL also helps in peer learning	3.224	1.278	3.49441
15	Use of VL improves students' listening skills	3.186	1.416	2.62251
16	VL sharpens students' digital skills	3.718	1.264	11.3188
17	**VL helps in reducing the cost of education**	**3.060**	**1.498**	**0.80412**
18	**VL increases employment opportunities for university students**	**2.957**	**1.260**	**-0.6774**
19	Virtual classroom is important in the present-day education system	3.494	1.396	7.0488
20	Use of advanced technology like artificial intelligence (AI) has given a progressive way for VL	3.713	1.242	11.4321
21	Online education has opened more avenues for the students to gain multidisciplinary expertise at their convenient time and peace	3.683	1.214	11.1998
22	Use of VL platform in all the courses offered by universities/institutes will allow student diversity and cross-culture learning	3.554	1.273	8.67119
23	VL helps in bringing global perspective and competency in the teaching methodology	3.640	1.189	10.7248
24	Compare to physical classroom education, VL education is more effective in terms of course delivery, concept clarity, use of teaching tools, interactions, and discussion	2.834	1.401	-2.3647
25	The use of blended learning (both physical and virtual) will	3.882	1.191	14.7527

	be more effective to impart quality education under India's new education policy, 2020			
26	Digital infrastructure plays a very important role in achieving objectives of India's new education policy, 2020	3.864	1.190	14.4677
27	Digital education embedding in the regular curriculum at all levels one of the prime conditions to achieve objectives of India's new education policy, 2020	3.592	1.221	9.66347
28	Monetary aid to students from the government to set up a virtual learning environment will boost students' morale to take up courses offered by the university/institutes	3.715	1.194	11.9346
29	The introduction of VL will help students to get international exposure at their respective Universities/Institutes	3.577	1.149	10.0017
30	VL will boost research activities at the university/institute level	3.562	1.306	8.56777