Is digital technology impacting students' learning behaviors?

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Abstract
The development of contemporary digital technology has altered educational pedagogies and techniques in support of group-based and technology-based education. The development and growth of digital technologies is exponential and enhancing the scope of education. At the same time, it is also important to know how the modern generation of students responds towards these technologies in education. During studies of literature on e-learning, it was found that most of studies are focused on process, acceptability, advantages and disadvantages of e-learning while studies on learning behavior of students is scant and also influenced through implementation of digital technologies. This study examined the impact of digital technologies' innovativeness on the learning behaviors of students. The data of 200 students is collected through the survey method and analyzed using regression analysis technique. The results show higher impact of digital technology on e-learning because e-learning is completely dependent on technology.

Keywords: ICT, e-learning, traditional learning, blended learning, Digital Technologies

INTRODUCTION

The accelerated growth of information communication technology(ICT) in the first decade of the 21st century has transformed educational practices and methodologies. With the introduction of vast-scale opportunities of worldwide web, growth of digital technologies in the form of mobile and cellular digital devices such as smart phones, tablets and establishing massive online educational platforms trigger(Tick, 2018) that student will, in large part, use these online resources and self-directed study with their own smart and mobile devices. This new generation known as the "digital natives" enters higher education. They have a completely different approach and attitude towards digital technologies platforms than earlier generation, including their parents. Online education is providing various benefits to students they can access education anywhere at any point of time and benefits to instructors as they can disseminate their knowledge at global level. Growth of ICT in education is exponentially increasing at global level at the same time it also creating knowledge gape as all students is not blessed with sufficient internet infrastructure facility such as underprivileged students are facing problem in getting education. In developing countries digital divide still exist as all students do not have internet connectivity and expensive gadgets. Students are attracting towards e-learning because of its various advantages if they wants to work with studies it is possible only because of e-learning. While teachers are now with the help of digital technologies can create varieties of creative content that can be useful for any number of students. Technologies are entering into different domain such as hospitality, finance, transportation and now it is transforming the education system. Adoption of digital technologies depends on different factors such as what are facilities and support provided by the institution, quality of service, instructor quality, and self efficacy of learner. Acceptability of digital technology for instructors mainly affected by perceived usefulness of technologies. Instructors need to update themselves as per the requirement of new education environment. Institution also required huge investment for providing support to e-learning environment in forms of hardware and software.

LITERATURE REVIEW

Exponential growth of digital technologies has affected almost every sector including education sector. Technologies were there but as complementary to conventional learning.1496 research articles based on e-learning and related aspects were published in different reputed journal in last two years only (Fauzi, 2022). Researchers has discussed different aspects of online teaching and learning platforms such as issues, challenges, barriers and opportunities they have suggested digital technologies implementation strategies (Dua et al., 2015, Bayu and Ridi, 2021).(Jha and Shenoy, 2016)suggested use of technology is the supplement for the physical classroom teaching, it cannot be fully replacement of usual/physical classroom study(Lakshmi, 2016). A cutting-edge method of education is digital learning. It is the environment made up of combination of teacher and student centric choice in which different collaboration of technologies is used to provide best learning environment and knowledge. However, the problems of e-learning must be solved with support and best practice solutions in order to be effective in this learning environment(Gond and Gupta, 2017).Various studies find out that the infrastructure is the biggest issue specially in developing countries and required development as well as huge investment. Although Indian government took various initiatives to promote digital education but it also required that facilitator/instructor also trained and ready to implement. After reviewing of previous studies the author has found that only few studies has been done on Indian Education regarding e-learning.

OBJECTIVE OF THE STUDY

- To investigate the relationship between the digital technologies and traditional learning, e-learning, blended learning.
- To evaluate the impact of digital technologies on learning behavior of students.

RESEARCH METHODOLOGY

The study is based on primary data. The data has been collected using survey instrument through a questionnaire which was designed in Google form after discussion with students at different level of education. Five point likert(Likert 1932) scale from strongly disagree to strongly agree was used. Relationship among variables was developed through regression analysis technique. The respondents of this study were students from school to doctorate level in India and they are being ICT equipped. Two hundred questionnaires were shared out of which 184 complete questionnaire with proper response received.

Digital Technologies
 Digital technologies are tools, systems, and equipment that use electronic components to process and store data. Mobile devices, smart boards, tablets, MOOCs are the examples of digital technologies which are widely use in education sector.

Learning Behavior
It is the relationship between the knowledge gained by the students and its application into social behavior. The learning is affected by various factors and digital technologies are one of the important factors among them. How digital technologies shaping education and impacting learning is important. In this study we are proposing examination of impact of these technologies on learning behavior.

H_{01}. There is no impact of Digital Technologies on learning behavior of students.

Blended Learning
 Learning which hybrid form of conventional and e-learning is blended learning. In this kind of learning students uses both traditional as well as e-learning as per requirement. This learning technique is now a

day's highly accepted by the students. This method of learning is providing benefits of traditional and modern learning together. Here we are investigating how much digital technologies impacting blended learning.

$H_0$1.1 There is no impact of Digital Technology on Blended Learning.

Traditional Learning

Leaning which is based on conventional pedagogies such as lecture based teaching, face-to-face teaching. Digital tools and techniques are creating new era and opportunities of learning. In this study we propose to find the relationship and significance of digital technologies on traditional learning.

$H_0$1.2.: There is no impact of Digital Technology on Traditional Learning.

E-learning

Learning which is based on application of computer based technologies. As today's generation is the generation of computer there are different platforms created and provided by government initiatives which is providing facility of e-learning. E-learning is facilitated through digital advance technologies. It is important to identify how much digital technologies impacting e-learning.
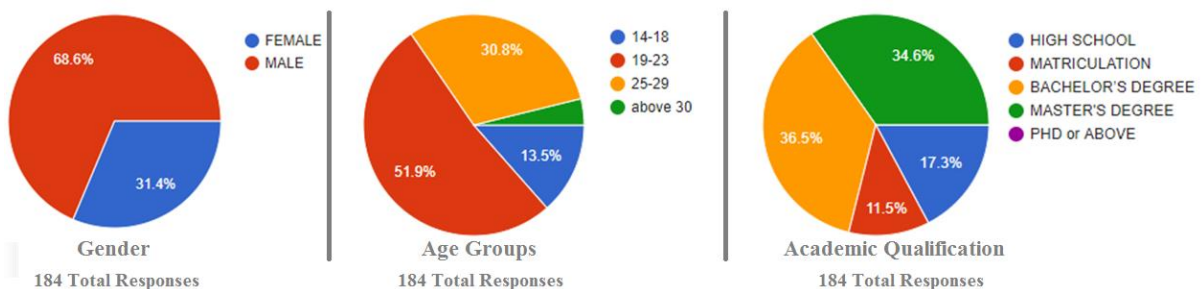
$H_0$1.3.: There is no impact of Digital Technology on E-learning
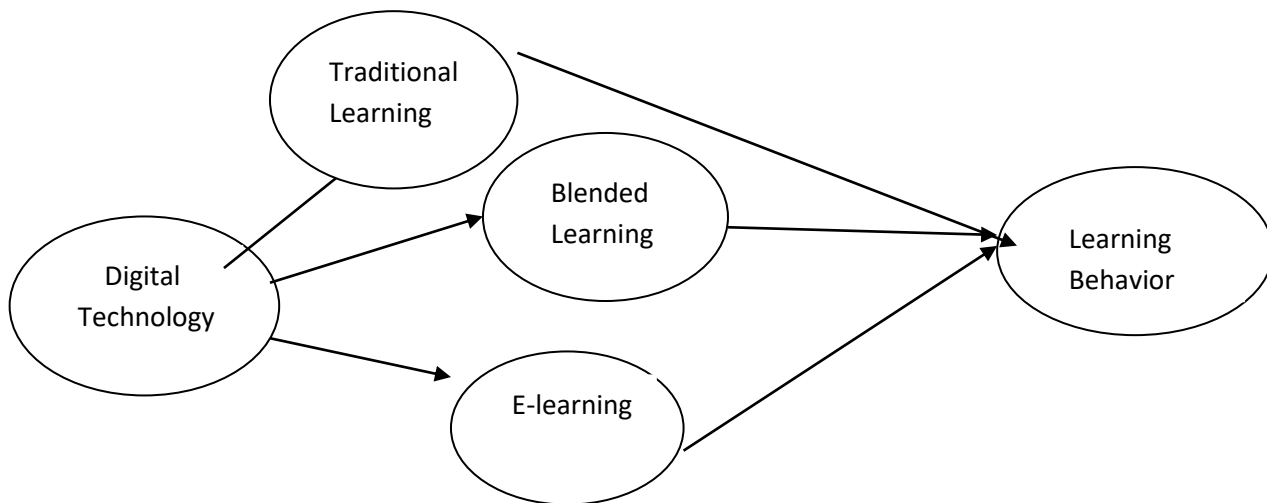
Conceptual Framework

DATA ANALYSIS AND INTERPRETATION

Null (H_{01}). There is no impact of Digital Technologies on learning behavior of students.

On the basis of frequency analysis we found male respondents' are using digital technologies more as compared to female respondents for learning, similarly when we consider age of the respondents it is found that respondents' who are between 19-23 years age group is using more digital platform for learning as compared to other age groups respondent. Usage of digital technologies is low at school level as compared to higher studies it means digital technologies are playing significance role at higher education level.

RELIABILITY MEASUREMENT

S.	Variable Name	Cronbach's Alpha	Item
1	Digital Technology	0.776	8
2	Traditional Learning	0.701	4
3	E-Learning	0.811	4
4	Blended Learning	0.789	4

In the above table researcher determines reliability of each variable using Cronbach α estimates (Cronbach,1951) , and all the variables found reliable as their CR value is greater than 0.7 (Nunnally and Bernstein, 1978)which is indicating the questionnaires were used for data collection is reliable and providing useful & relevant information from data side.

REGRESSION ANALYSIS

The regression analysis is the technique which describes the level of significance and affect of independent variable on dependent variable. It describes the relationship through an equation.

Linear Regressions between Digital Technology & Learning Behaviour of students:
The regression is calculated by taking the total of Digital Technology as an independent variable and learning behavior as dependent variable using SPSS software.

$H_0$1. There is no impact of Digital Technologies on learning behavior of student.

$H_0$1.1. There is no impact of Digital Technology on Blended Learning.

Regression results
Table-1(Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.740[a]	.548	.547	2.85097

a. Predictors: (Constant), Digital Technology

As table- 1 shows the R square value is 0.548, it is indicating that 54.8% of variance explained by Digital Technology on Blended learning and it means that Digital Technology(ID) is 54.8% affecting to Blended Learning(D). The value of R which is 0.740 shows highly positive relationship between digital technology and Blended Learning.

Table No -2

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3925.238	1	3925.238	**482.926**	**.000^a**
Residual	3234.960	398	8.128		
Total	7160.197	399			

a. Predictors: (Constant), Digital Technology

b. Dependent Variable: Blended Learning

Table of ANOVA shows Significant F value 482.926 at .000^a % which shows there is a significant relationship between digital technology(ID) and blended learning(D).

Coefficients^a
Table No – 3

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	3.791	.719		5.273	.000
Digital Technology	.391	.018	**.740**	**21.976**	**.000**

a. Dependent Variable: Blended Learning

Table- 3 shows the coefficient results. As indicated that the beta value is .740, which means that the change in digital technology by one unit will bring about the change in the blended learning by .740 units.

Furthermore, the beta value is positive, which indicates positive relationship between digital technology and blended learning.In Coefficients table the obtain value of 't' 21.976 which is significant at 0% level of significance, indicating the direct impact of Digital Technologies on Blended Learning behavior of students. Hence the null hypothesis **H₀1.1** is rejected.

Linear Regressions between Digital Technology & Traditional Learning
Regression is calculated by taking the total of Digital Technology and Traditional Learning using SPSS software.

H₀1.2 There is no impact of Digital Technology on Traditional Learning.

Regression results
Table No- 4 (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**.716^a**	**.513**	.511	2.97554

a. Predictors: (Constant), Digital Technology

As table-4 shows the R square value is 0.513, it is indicating that 51.3% of variance explained by Digital Technology on Traditional learning and it means that Digital Technology(ID) is 51.3% affecting to Traditional Learning(D). The value of R which is 0.716 shows highly positive relationship between digital technology and Traditional Learning.

ANOVA^b
Table- 5

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3706.579	1	3706.579	**418.642**	**.000^a**

Residual	3523.819	398	8.854		
Total	7230.397	399			

a. Predictors: (Constant), Digital Technology

b. Dependent Variable: Traditional Learning

Table of ANOVA shows Significant F value 418.642 at .000[a] % which shows there is a significant relationship between digital technology(ID) and Traditional learning(D).

Coefficients[a]
Table No – 6

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	3.649	.750		4.862	.000
Digital Technology	.380	.019	**.716**	**20.461**	**.000**

a. Dependent Variable: Traditional Learning

Table- 6 shows the coefficient results. As indicated that the beta value is .716, which means that the change in digital technology by one unit will bring about the change in the traditional learning by .716 units.

Furthermore, the beta value is positive, which indicates positive relationship between digital technology and traditional significance, indicating the direct impact of Digital Technologies on traditional learning behavior of students. Hence the null hypothesis **$H_01.2$** is rejected.

Linear Regressions between Digital Technology & E-learning:
The regression is calculated by taking the total of Digital Technology and E-learning using SPSS software.

$H_01.3.$: There is no impact of Digital Technology on E-learning

Regression results
Table No – 7 (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**.838[a]**	**.702**	.701	2.66376

a. Predictors: (Constant), Digital Technology

In Model Summary shows the R square value 0.702, it is indicating 70.1% of variance explained by Digital Technology and e-learning, it means that Digital Technology is 70.1% affected to E-Learning. The value of R which is 0.838 shows highly positive relationship between digital technology and E-Learning.

As table-7 shows the R square value is 0.702, it is indicating that 70.2% of variance explained by Digital Technology on e-learning and it means that Digital Technology(ID) is 70.2% affecting to e-Learning(D). The value of R which is 0.838 shows highly positive relationship between digital technology and e-Learning.

ANOVA[b]
Table- 8

Model	Sum of Squares	df	Mean Square	F	Sig.

1	Regression	6644.543	1	6644.543	**936.429**	**.000ᵃ**
	Residual	2824.055	398	7.096		
	Total	9468.598	399			

a. Predictors: (Constant), Digital Technology

b. Dependent Variable: E-Learning

Table of ANOVA shows Significant F value 936.429 at .000ᵃ % which shows there is a significant relationship between digital technology(ID) and e-learning(D).

Coefficientsᵃ
Table – 9

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	-.071	.672		-.106	.916
Digital Technology	.509	.017	**.838**	**30.601**	**.000**

a. Dependent Variable: E-Learning

Table- 9 shows the coefficient results. As indicated that the beta value is .838, which means that the change in digital technology by one unit will bring about the change in the e-learning by .838 units.

Furthermore, the beta value is positive, which indicates positive relationship between digital technology and e- learning.In Coefficients table the obtain value of 't' 30.601 which is significant at 0% level of significance, indicating the direct impact of Digital Technologies on e- Learning behavior of students. Hence the null hypothesis $H_01.3$ is rejected.

Conclusion

With the help of above analysis we conclude that digital technologies are creating positive impact on behavior of students through traditional, blended and e-learning. Although students are using digital technology but the importance of traditional leaning is equally important for them. Digital technologies are more accepted by the students because of its convenient usage but they also value the importance of teachers' interaction during learning. Study describe that digital technology is important in improving knowledge, saving cost & time of students but it should be implemented with the traditional learning, as in India being a developing country, all students are not able to afford internet accessibility. Implementation of only digital technology will increase existing digital divide as results underprivileged students will suffered more. Digital technology is complementary to traditional learning not the replacement of traditional learning.

References

1. A.Tick, 2018. Research on the Digital Learning and E-learning Behaviour and Habits of the Early Z Generation. IEEE 22nd International Conference on Intelligent Engineering Systems (INES), 33-38, doi: 10.1109/INES.2018.8523906.
2. Bayu, R.A., Ridi, F., Sri, S.K., 2021. Barriers to Digital Transformation in Higher Education:An Interpretive Structural Modelling Approach. International Journal of Innovative and Technology Management(IJITM),18(05),1-18.
3. Cronbach, L.J. (1951), "Coefficient alpha and the internal structure of tests", Pyschometrika,
4. Vol. 16 No. 3, pp. 297-334.
5. Dua1 S., Wadhawan S., Gupta S., 2015. Issues, Trends & Challenges of Digital Education: An Empowering Innovative Classroom Model For Learning. International Journal of Science Technology and Management. 5(5).

6. Fauzi A.M., 2022. E-learning in higher education institutions during COVID-19 pandemic:current and future trends through bibliometric analysis. Heliyon 8 e09433.

7. Gond R., Gupta R., 2017. A Study on Digital Education in India: Scope And Challenges Of An Indian Society. International Journal of Research in Regional Studies, Law, Social Sciences, Journalism And Management Practice 2(3).

8. Jha N., Shenoy V., 2016. Digitization of Indian Education Process: A Hope or Hype. IOSR Journal of Business and Management (IOSR-JBM) 18(10), 131-139.

9. Kumar A.S.S., 2014. Emerging Technology on smart Class teaching in school education. IJSR 3(8).

10. Lakshmi N.V., 2016. Digital Education in India. International Journal of Innovative Research in Information Security (IJIRIS) 3(9).

11. Likert, R., 1932. A Technique for the measurement of attitudes. Arch. Psychol. 140, 1–55.

12. Nunnally, J.C. and Bernstein, I.H. (1978), Psychometric Theory, McGraw Hill, New York, NY.

13. Patel, J.M., 2017. Web Based Tools Of Technology In Future Teaching Learning Strategies. International Education & Research Journal [IERJ] 3(2).