

Effectiveness of Online Educational Applications in India

Silogi¹, Dr. Shiba C Panda²

¹Research Scholar, Department of Management, Mewar University, Chittorgarh, Rajasthan, India

²Associate Professor, Department of Commerce, Satyawati College EVE., University of Delhi, India

ABSTRACT

The outbreak of COVID-19 pandemic forced the entire education system to shift universally from offline to online mode of learning. Although the online system was not an altogether new concept, the pandemic almost overnight changed the teaching-learning scenario and both parties got used to the novel ways. Online learning brought in its wake several advantages. These include: both teachers and learners got used to espoused technologically superior ways; flexitime learning, overall time saving by cutting commutation and other physical barriers, making the learning process more interesting, stimulating, and retentive with increased use of audio-visual material, etc. The online system indirectly opened doors to a new breed of EdTech players, and a host of start-ups discovered new opportunities. Around 20 educational apps are providing their services in India. They cater to the needs of wide array of learners from the level of kindergarten to post-graduation, competitive exams, language learning programmes across all the streams. However, the online sector also has significant limitations like absence of personal touch, heavy dependence on internet in an era when connectivity and dependable maintenance services are not in place due to inadequate skilled manpower and technological infrastructure. Then, there are health issues like increased screen time that impinges on the health of eyes, etc. This paper brings out the relative features of both offline and online teaching and the necessity of having balance of both systems and examines the awareness & perception of students towards educational apps and discusses advantages & limitations of online education learning. The opportunities for the entrepreneurs to innovate best products relevant to the needs of changing curricula in educational institutions.

Keywords: Educational App, Ed Tech sector, Online learning

INTRODUCTION

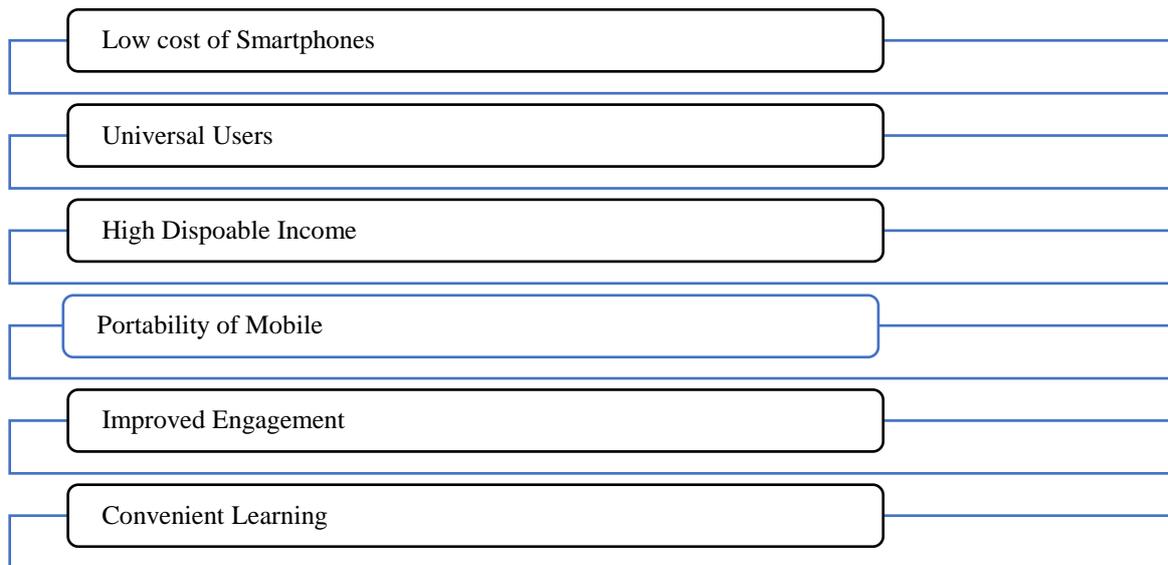
The invention of mobile telephone or handset is landmark in the history of human communication. From landline phones through pagers, CDMA, GSM, tablets to smart phone. The usage of mobile phone is not restricted to shopping, e-banking, trading, and social networking. It has substantially seeped into education industry. Even Alexander Bell, father of telephony would not believe its wide spread and overwhelming applications all around. It has also brought immense benefits to educational fraternity and institutions.

Over time, as a learning resource, we have evolved from 'books to webpage'. In recent past, the unforeseen COVID-19 accelerated the pace and spread of e-learning. Due to compliance with social distancing norms imperative in the pandemic, face-to-face learning was abruptly replaced by digital modality of teaching-learning.

The elongated phase of pandemic during 2020 and 2021, even beyond, had the advantage of introducing and honing the digital skills of teachers and learners of all categories. Numerous teachers & learners were first-time users of smartphones and laptops yet they soon became comfortable with the new modality.

Interestingly, teachers and learners at times prefer online methods even though COVID-19 is no more a panic, but turned out to be a common ailment like cold. Usage of online methods have set a footing in Indian education sector.

Table 1.1 Facilitators for E-Learning



With the paradigm shift that ushered in the wake of pandemic years, there was renewed need to look at the role of E-learning devices from a novel perspective.

Table 1.2 Indicative List of Edu tech in India

S No.	Name	Year of Operation
1	BYJU'S	2011- Curriculum, IIT-JEE, CAT, UPSC, GMAT, GRE, Engineering & Medical
2	Unacademy	2010 - Entrance: Premedical, CA, Banking, UPSC, CLAT
3	iQuanta	2015 - Cat preparation
4	TrainerCentral	2021 - Content, designing curriculum, E-mail marketing etc.
5	upGrad	2015 - Professional certificates, Product management, Data science, Management program etc.
6	Next Education	2017 - Program such as Teach Next, Learn Next, Maths Lab, Science Lab
7	Vedantu	2011 - Curriculum from Grade 6 -12
8	Toppr	2013 - School curriculum & entrance like SAT, JEE, NEET, UPSC
9	Simplylearn	2013 - Post graduate program in collaboration with foreign universities
10	Udemy	2009 - IT-based courses
11	WhiteHat Jr.	2018 – Coding
12	IIM Skills	2015 - Content writing, Digital Marketing, Technical Writing
13	Simplilearn	2021 - Digital Marketing, Cloud Computing etc.
14	edX	2012 - Data Analytics, AI, Fintech, Cyber security etc
15.	Extramarks	2007 - All subjects of school, JEE, NEET
16	Exotic Learning	2020 – Skill-based courses
17	PlanetSpark	2017 - Public Speaking & Creative writing
18	Cuemath	Kindergarten to grade 12 Maths

*Self-compiled list from internet

OBJECTIVES

- i. To study the level of awareness of educational applications.
- ii. To study the modus operandi of E-learning players in India.
- iii. To evaluate the role of educational applications in learning.
- iv. To examine the outcomes of E-learning.

METHODOLOGY

Research design and scope of the study: The study is descriptive in nature and focuses on E-learning applications in India. It covers questions like 'How students can use learning apps effectively'.

Data collection tools: Data were collected using a set of standardised and structured questionnaires & personal interviews. Measures were administered to investigate economic variables and psychological factors. Questions on frequency of using educational app, types of apps used, were asked from the respondents. All the participants were required to give consent for submitting filled-in questionnaire. The questionnaire was divided into two parts: (1) demographics and (2) survey questions.

Sources of data: Primary data was obtained through questionnaire and discussion with respondents. Secondary data was obtained from sources like published papers, documents and reports by research companies, surveys, books and related websites. The analysis was primarily based on first-hand information collected by the author.

Period of the study: The survey was conducted for a period of 32 days, between 1 April, 2025, to 3, 2025.

Limitations of the study: The study was conducted during the limited period of 32 days, to bring out the practices of E-learning amongst the Indian students residing in metro cities. Due to limitation of time the sample size was small.

The modest size of sample (200 respondents) may yield subjective results, and may not be enough to draw definitive conclusions.

LITERATURE REVIEW

Pugalendhi & Mary (2022) observed that the importance of education cannot be understated especially in a country like India. Education plays an important role by contributing towards economy of a nation. Adoption of technology helped the companies resume their daily operations to near normal. Online pedagogy involving electronic devices such as laptop, desktop, personal computer, tablet and mobile phones, facilitated E-learning. Schools introduced different platforms such as Microsoft teams, google meet, zoom to impart online classes. Most of these were free while few were chargeable. The process of imparting education is not restricted to physical setting of classroom. The online lecture should not be long enough as it can adversely affect the health shown as redness of eyes, back pain, strain on eyes and fatigue. Another limitation is lack of regulation on educational app.

According to Sunitha & Singh (2020), learning is an ongoing process, and now the focus is almost wholly on online learning. Although mobile learning has become an integral part of education of any level. There is now a trend especially among higher education aspirants to opt for cost-effective online channels since many of them are engaged in work or business and flexible timings suit them. Increasing number of institutions including big names have set up online programmes. For example, with the stated motto, 'When the student is ready, the teacher should appear,' UNIVO Education, with 60+ programmes partners with universities and higher education institutions in conduct of online courses (Economic Times, Delhi, 20 July 2023).

Educational resources are accessed using various devices such as tablets, smart phones, laptops, desktops, iPads, and PDAs. Advancement in technology has triggered teaching learning process. The imparting and sharing of knowledge is no more restricted to physical surrounding.

Educational app integrates education with visual effects making it quite stimulating for learners. Visual-based content better sustains the interest of the learner leading to better outcomes.

Benefits of mobile learning: Technological advancement has resulted in change in learning process. Mobile learning is advanced learning enabling blend of traditional learning with technology. M learning removes the barriers of time, distance, and place. These apps make learning stimulating and joyful for the new age learners.

Internet is warehouse of information. This study highlighted that majority of the students (96%) depend on the internet for study, followed by social networking (83%) while the other respondents use internet for news (75%), e-mail (48%), research (16%), and entertainment (41%).

M learning is the fastest segment across all segments of e-commerce (Shoaib & Aditya 2017). It facilitates amalgamation of technology, education, and training for all strata of society. The M learning has a wide spectrum beyond academics, it extends to lay individual and corporate learners.

The dependency on educational app & online learning has increased tremendously. Help is especially sought in following subjects:

Mathematics
English
Sciences

About 33% of the students seek help in mathematics, 15% in English and 15% in sciences. About 56% students prefer online learning (Brainly Survey, 2021). The survey found that with new mode of app-based learning, the students and others can learn anywhere, and at one's own pace, something not possible in traditional class room setting. The survey also concluded that educational app is helpful in addressing queries related to homework and solving subject-related queries, as reported by majority of the students.

The rich curriculum promises not only learning of essential content but also paves way for success in life. But it presents some challenges as well, like higher cost of education, large number of students, lack of ability to provide equitable education etc. The future of online learning is heavily dependent on the digitisation and electronics infrastructure.

EduTech sector: Pivotal role in online education

Educational technology (EdTech) employs application of computer hardware, software, educational theory & practice to facilitate effective learning. The term also refers to the agencies developing hardware, software, manpower & allied products towards growth of online education.

The EdTech segment encompasses usage of computer programmes and skilled manpower. The pre-requisites for this sector to grow are: advanced, networked computers, besides a befitting education system to facilitate the learning by students.

Pandemic years and the Aftermath: The dreaded Covid impacted education sector significantly, not only in pace of learning but also break from regular learning. Initially the questions were raised for effectiveness, reliability and technical aspects like bandwidth, availability of suitable device etc. but these were allayed. However, it was to be ensured that health of students is not compromised considering the widespread nature of Coronavirus (Muthuprasad et al, 2021).

During lockdown and indefinite closure of the schools & colleges, the institutional faculties experimented with the ways of incorporating online teaching. Most in use were: Microsoft teams, zoom, blackboard & other online platforms. Apart from the benefits of flexible learning and convenience of the learner, online mode during Covid, other positive feature of online mode has been the interactive session.(Prasad, Aiswarya , Jha K .2021)

Product Marketing: The concept of product marketing is essentially different from service marketing. Since services are characterised by inseparability, intangibly & perishability. Each characteristic posed challenges to marketer (Kotler & Gary, 2020). As a result of intensified competition customers are now empowered.

Table 1.3 Govt. Initiative For Digital Learning

S. No.	Name	Year	Purpose
1.	DIKSHA	2011	Knowledge sharing, web portal for Gr 1-12
2.	e-PG Pathshala	2015	E Books & content based on curriculum
3.	SWAYAM	2017	32 Channels aiming, One Class, One Channel
4.	PM E -Vidhya	2020	Comprehensive program to make online education accessible
5.	E Pathshala	2015	E textbooks in 70 subjects
6.	NDLI	2018	Repository of learning resources

DIKSHA = Digital Infrastructure for Knowledge Sharing, An Initiative of the National Council of Educational Research & Training (Ministry of HRD, Govt. of India); SWAYAM = Study Webs of Active Learning for Young Aspiring Minds; NDLI = National Digital Library of India

*Self-compiled list from Internet

DATA ANALYSIS

Table 1.4 Online learning programme before COVID-19 pandemic

	Frequency	Percentage (%)
Yes	74	37.0
No	126	63.0
Total	200	100.0

Table 1.5 Switching to Online learning amid or post lockdown

	Frequency	Percentage (%)
Yes	107	53.5
No	93	46.5
Total	200	100.0

Table 1.6 Attended any E-learning programme

	Frequency	Percentage (%)
Yes	57	28.5
No	143	71.5
Total	200	100.0

Table 1.7 Awareness of concept of Educational app

	Frequency	Percentage (%)
Not aware	14	7.0
Somewhat aware	29	14.5
Aware	98	49.0
Not sure	13	6.5
Well aware	46	23.0
Total	200	100.0

Table 1.8 Awareness of Educational App(s)

Name of the Edutech	Frequency	Percentage (%)
I. Byju's	158	79.0
II. Vedantu	121	60.5
III. Vidyakul	12	6.0
IV. Khan Academy	81	40.5
V. Unacademy	123	61.5
VI. Meritnation	42	21.0
VII. Unfold U	5	2.5
VIII. Topper	93	46.5
IX. Duolingo	84	42.0
X. Learning Radius	4	2.0%
XI. Brainly	100	50.0%
XII. Ocky Rocky	4	2.0%
XIII. .Udemy	55	27.5%
XIV. Physics wallah	8	4.0%
XV. All of the above	7	3.5%
Any other (courseera, Wikipedia, DeeCee, Bada Business, paramount, learning radius, extramarks)	7	3.5%
XVII. None	4	2.0%

Table 1.9 Factors Attributing Success of An Educational App

S. no.	Bases	1	2	3	4	5
1.	Content	103	15	25	17	40
2.	Price	66	48	43	23	20
3.	User friendly	83	26	36	25	30
4.	Accessibility	78	33	35	24	30
5.	Mobile friendly	72	43	37	25	23
6.	Regular assessment	58	49	45	19	29
7.	Online tutorial & session	66	42	40	21	31
8.	Offline mode	56	39	51	30	24
9.	Addressing multi lingual audience	56	37	54	26	27
10.	Customisation of pace	54	49	45	29	23
11.	Universal users (catering to need of special children)	61	33	55	20	31
12.	Marketing	51	42	51	28	28

Table1.10 Role of educational app in learning

	Frequency	Percentage(%)
Hardly any	29	14.5
Somewhat	97	48.5
Substantial	74	37.0
Total	200	100.0

Table 1.11 Difference Between App-Based Learning & Direct Learning

	Frequency	Percentage (%)
I. Extensive engagement in case of app-based learning	51	25.5
II. Feedback is possible through educational app	68	34.0
III. Persuasive communication in app-based learning	44	22.0
IV. Multimedia tools makes app learning interesting	80	40.0
V. Direct learning requires less time to understand	96	48.0

Table 1.12 Limitation(s) of online learning

S.No.	Limitation(s)	Frequency	Percentage (%)
1. 1	Poor internet connectivity	110	55.0
2	Limitation on usage of data	72	36.0
3	Little or no human intervention	79	39.5
4	Lack of self-discipline	115	57.5

- Respondents may have opted for more than one choice.

Table 1.13 Educational apps & Geographical location

	Metro	Rural	Semi Urban	Urban	Total
Byju's	67	11	18	62	158
Unacademy	56	7	16	44	123
Vedantu	53	9	14	45	121
Brainly	40	5	16	39	100
Toppr	45	4	14	30	93
Khan Academy	37	4	8	32	81
Udemy	28	3	8	16	55

Statistical Analysis

The data has been collected through google form. It was summarised using frequency distribution along with percentage. Chi square test has used to find the association of categorical variables. The p value <0.05 has been considered significant. All statistical analyses were performed using SPSS (Statistical Packages for Social Sciences)

- There are 115 (57.5%) female and 85 (42.5%) male participants.
- Majority 91 (45.5%) were students. Further, 50 (25%) were working professionals followed by 22 (11%) self-employed.
- Majority of respondents (88, 44%) were from the age group 12-20 years. Then 37 (18.5%) were 30-39 years and 33 (16.5%) were of age 40-49 years.
- 43.5% were from Metro cities and 38.5% were from Urban areas.
- 68 participants have educational qualification as 12th, 55 were post graduate, 45 were graduate and 27 have class 10th.
- 126 (63%) participants never enrolled for online learning programme before COVID-19 pandemic. During COVID-19, or post-lockdown, 107 (53.5%) participants switched over to online learning system.
- After COVID-19 there were only 57 (28.5%) who did not attend any E-learning programme. So, the number has decreased from 126 (63%) to 57 (28.5%).
- 81.5% participants access educational resources that are available online.
- Byju's, Unacademy, Vedantu, Brainly and Topper are found as 5 most popular educational apps. Khan academy and Udemy stand at 6th and 7th position respectively.
- Participants mostly used educational app for academic study material (51%) or for competitive exam study material (27.5%). Dictionary & encyclopaedia (26%), Language learning (25.5%), Quiz and News (25.5%), Technical skills (24.0%) and Art & craft (23%) were other reasons to use educational app.
- According to the study, 'content' is most important factor in making an educational app successful (51.5%), 'user friendliness' (41.5%) of apps is second important factor, 'accessibility' (39%) is third, 'mobile-friendly' (36%) is fourth, 'price' (33%) and 'online tutorial & sessions' (33%) both are fifth most are factors important in making an educational app successful.
- 48.5% said that somewhat educational apps are playing role in learning whereas 37% said it plays a substantial role.

- While comparing for app-based learning and direct learning, 96 (48%) said that Direct learning requires less time to understand. Whereas 80 (40%) said that Multimedia tools make app learning interesting and 68 (34%) had an opinion that Feedback is possible through educational app. 25.5% believes extensive engagement and 22% said 'persuasive communication' in case of app-based learning.
- 'Lack of self-discipline' (57.5%) and 'poor internet connectivity' (55%) are the two major limitations of online learning. 39.5% said little or 'no human intervention' and 'limitation of usage of data' (36%) are other limitations.

Comparisons

- Whether the participant has ever enrolled for online learning programme before COVID-19 pandemic has no significant association with Gender; it has no association with whether participant had ever attended or switched over to online learning system amid or post lockdown. Also, it has no association with participant's ever having attended any E-learning programme.
- Whether the participant has ever enrolled for online learning programme before COVID-19 pandemic has a significant association with Occupation viz. whether students were engaged ($p = 0.018$). Occupation has an association with participant having ever attended or switched over to online learning system amid or post lockdown ($p = 0.002$). Occupation has no association with participant having ever attended or not, any E-learning programme.
- Age, geographical location and educational qualification has no statistically significant association with the participants having ever enrolled for online learning programme before COVID-19, or having ever attended or switched over to online learning system amid or post lockdown and having never attended any E-learning programme.
- There is a statistically significant difference between participants' 'occupation' and awareness of the concept of educational app ($p = 0.003$). There is a statistically significant difference with participants' 'occupation' and their views on role educational app plays in learning ($p = 0.011$).
- Age has an association if in accessing educational resources online ($p = 0.046$).

Drawbacks of online learning

Despite technological advancements reaching new heights in online learning modalities and barriers of distance, boundaries, it faces certain challenges. These include:

- Excessive screen time of students
- Heavy dependence on technology
- Misuse of technology
- Social & Economic disparity
- Low internet penetration in rural India.

CONCLUSION

Integration of education and technology has brought paradigm shift in educational sector. With the amalgamation of Machine learning (ML), Augmented Learning (AL), and Artificial learning, the study material can be tailored to suit any specific group of the students & teachers. The COVID-19 pandemic has taught us physical learning approach opposing conventional learning. However, the conventional method of learning should not be underrated. The better move will be integration of both technology and conventional pedagogy. The paper addresses the challenges faced by E-learning companies, as well as opportunities for the related industries.

Keeping in view the needs of Adaptive learning i.e. where students learn at their own pace & interest, changes in content and the approaches of learning with tilt towards skills, technological advances will have great role to play.

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