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Perception of the Key Stakeholders of Education on the Acceptance of Edutech Platforms in Teaching-Learning Process

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Abstract

EduTech applications have played a vital role in carrying out the learning activities during lockdown periods for the students and educationists. In the future; these platforms are going to change the learning approach for students and educators. This study examines the perception and acceptance of the students and teaching professionals towards the usage of the EduTech applications. The study-in-progress analysed the technology acceptance model (TAM) for work-related tasks with e-learning and used TAM as a basis for hypothesizing the effects of such variables on the use of e-learning as the application. The study concludes that attitude towards use and perceived ease of use significantly affects the intention to use teaching-learning applications. The study suggests that to capture the large market and satisfy participants, it is necessary for the existing and potential EduTech platforms to provide active experience and complete course content to the participants.

Keywords: Education, Technology, Stakeholders, Acceptance, Platforms

Introduction

Teaching Styles have changed significantly from traditional methods to modern interactive methods over a period of time. The initial methods of providing education were through recitation and memorization, whereas the modern approach utilizes online and interactive methods. Stable progress of e-Learning in recent years (Mulder and Janssen, 2013) has also prompted universities and educators to use a variety of online learning techniques, such as Learning Management Systems, Internet-based technology for learning, Information, Communication, and Technology (ICT), and Social Network-based Learning or mobile learning (Liao et al., 2019; Eksail and Afari, 2020; Huang et al., 2020), to improve the effectiveness of traditional classroom instruction by assisting students in learning independently and developing problem-

solving abilities. (Liu et al., 2010; Tian et al., 2014). But COVID-19 emerged at the end of December 2019 and this global pandemic has made a significant impact on higher education students' learning because they were in the middle of semesters and the lockdown imposed on them, forced them to change their learning techniques. Due to the pandemic initiated complete lockdown in countries, students were not able to learn on a face-to-face basis with their educators. To cope with this situation students and educators used computer-based or technology-aided methods (teaching-learning applications) for learning. Students and educators used different teaching-learning applications like Google classroom/meet, Unacademy, Byjus, YouTube Channels, Zoom, Jio Meet, etc. Despite the rise in the number of online learners, Online learning has always been associated with a number of dangers, including

the absence of teachers, a lack of peer connection compared to face-to-face learning, low motivation, poor time management, and a lack of individual learning abilities. (Cole et al., 2004; Golladay et al.2000; Hannay & Tracy, 2018; Kirtman, 2009; McKeachie, 2002; Nguyen, 2015; Ryan, 2001; Serwatka, 2003; Xu & Jaggars, 2013). Several researches comparing students' perspectives of e-learning with traditional learning in terms of social presence, social interaction, and satisfaction, discovered that e-learning is evaluated as lacking in social interaction, social presence, and effective coordinated communication., it provides several benefits including convenience and ease of time, an easy understanding of critical concepts and subjects and gives opportunities to work while learning (Cuthrell & Lyon, 2007).

In this study, we investigated the perception and acceptance of teaching-learning applications by students and teaching professionals through the Technology acceptance model (TAM).

Literature Review

This study investigated the use, intention and acceptance of teaching-learning applications based on the theory of TAM, targeting students and educators in the Ahmedabad city. This section consists of TAM Model and online teaching-learning-related research work.

The Technology Acceptance Model (TAM) created by Davis (1989) is one of the most generally utilized models to explain a potential user's behavioural intentions towards using technological innovation. This model, with high reliability and validity as reported in Adams (1992), contained the constructs of perceived ease of use, perceived usefulness, attitudes towards using, and behavioural intention of use (1989). Using the Extended Technology Acceptability Model (ETAM), Prasetyo

(2021) assessed student acceptance of an online learning platform during the COVID-19 pandemic. The results showed that PEU (perceived ease of use) had the highest impact on actual use (AU), followed by UI (user interface) and SQ (system quality). Iaman and Turki (2012) revealed that accessing course materials, looking for relevant information, sharing knowledge, and completing homework were significantly associated with students' perceived usefulness of mobile learning. During the investigation of students' use and acceptance of course websites, Selim (2003) discovered that there is a significant relationship between utilisation and ease of use when it comes to determining how frequently a website course is used. Using Google Meet's media-assisted teaching style, Setyawan et al. (2020) examined how well students learned at home and found out that students taught using Google Meet media-assisted lectures had higher knowledge and learning outcomes than comparison groups. Khan et al. (2021) analyzed the perception of university students toward e-learning during the ongoing COVID-19 pandemic. It revealed students' positive perception of e-learning and thus acceptance of this new learning system. Dorji (2021) studied teachers' preferences for classroom and online teaching in Bhutanese primary and secondary schools. Quantitative data found that over 50 per cent of teachers favoured e-learning, whereas qualitative data revealed that teachers preferred classroom teaching over online education for reasons such as authenticity, comfort, and affordability. According to Gismalla et al. (2021), most medical students like e-learning. During COVID 19 shutdown, 64 per cent of students said E-learning was excellent. A substantial link was found between medical students' opinions on starting E-learning and their level (Pre-clerkship and Clerkship). During

the Covid-19 outbreak, Olayemi et al. (2021) assessed students' readiness for online learning in Nigeria, The majority of respondents reported high levels of ICT skills and abilities required for online learning. Fear of high data costs, inadequate internet services, unstable power supplies, inaccessibility to online library resources, and limited computer access were reported barriers to effective online learning. Aggarwal (2020) assessed among all the other service providers and the competitors, Unacademy proves out to be the favourite among the people as the majority of the people are connected and have applied in Unacademy. Kim (2020) investigated the impact of zoom video lectures on learners' English reading achievement in real time remote video education; the study's findings revealed that zoom video lectures have a beneficial impact on learners' English reading achievement.

Therefore, researchers aimed to investigate the perception and acceptance level of teaching-learning applications by students and educators. The research questions were as follows:

1. Whether students and educators accepted online teaching-learning technology during the COVID-19 pandemic?
2. Which kinds of Edutech platforms are preferable?

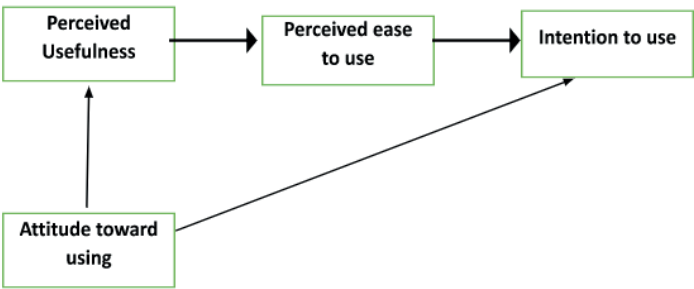
Research Methodology

This paper investigates the acceptance of teaching-learning technology and what kind of perception students and professionals have regarding its use with the help of TAM. Our research method consisted of four parts. In the first part, we created the research framework; second, we handled research assumptions; third, we explained the research method and steps and fourth, we examined research objects and sampling methods.

Research framework

In this study, TAM is divided into four aspects: perceived usefulness, perceived ease to use, intention to use, and attitude toward using, as indicated in Chart 1.

Chart-1: Empirical Model for Teaching-learning Technology Acceptance



Methodology

The main objective of this study is to identify the perception, acceptance, and attitude of the professionals, students, and other aspirants regarding the use of different teaching-learning applications. To meet the objective the relevant literature has been studied from Google

scholar, emerald publication, sage publication, web of science, Research Gate, medley, and other authentic sources. The design of the study is a descriptive and survey method. The variables identified from the literature suggest ease of use, perceived usefulness, and attitude towards use as

the independent variables that explain the dependent variable which is the intention to use the teaching-learning applications. From the literature, the research questions have been identified and some hypotheses are developed. The structured questionnaire has been framed to collect the data. The demographics, and the seven-point scale of perceived usefulness, perceived ease of use, attitude towards use, and intention to use are (Adams, Nelson, & Todd, 1992; Davis et al., 1989; Legris et al., 2003; Venkatesh & Davis, 2000) used for teaching-learning application acceptance. Therefore, 150 questionnaires are distributed, and 142 responses were recorded through the purposive sampling method from February to March 2021 in Ahmedabad city. Those 130 responses yielded valid responses that were used for analysis. The collected data has been analysed through SmartPLS 3 software to perform partial least square structural equation modelling. This study used some design, methods, literature, tools, and techniques that have certain limitations and the same applies to this study. Based on this, we propose the following hypotheses:

H1- Perceived usefulness has a significant effect on the perceived ease to use. According to Davis (1989), perceived usefulness is the notion that using new technology will improve one's

professional performance. Multiple times, the favourable impact of this variable on the adoption of information technologies has been demonstrated empirically. (Davis, 1989; Davis et al., 1989; Igbaria, Liveri, & Margahh, 1995; Lederer et al., 2000; Ong, YaLui.)

H2- Perceived ease to use has a significant effect on the intention to use. As previously said, perceived ease of use is defined as a person's perception of how easy it will be to use new technology. (Davis, 1989).

H3- Attitude towards using has a significant effect on the intention to use. The degree to which a user is interested in specific systems is known as attitude, and it has a direct impact on the user's desire to use those systems in the future. (Bajaj & Nididumolu, 1998).

H4- Attitude towards using has a significant effect on perceived usefulness. According to TAM, perceived usefulness has a direct impact on attitudes toward new technology use. The degree to which a user is interested in specific systems determines whether or not that user intends to utilize those systems in the future. (Bajaj & Nididumolu, 1998).

Table-1 indicates the scale of perceived usefulness, perceived ease of use, attitude towards use, and intention to use the teaching-learning applications.

Table-1: List of Variables Used in TAM Model

SECTION - I Perceived Usefulness (USE)	
Efficient Learning on TLA	USE1
Proper guidance & solution of queries on TLA	USE2
I can teach/learn at any place or time on TLA	USE3
SECTION - II Perceived Ease to use (ETU)	
Easy & Convenient for me to use TLA	ETU1
Simple to Understand TLA	ETU2
I can easily interact with students/teacher	ETU3

SECTION - III Attitude toward use (ATU)	
Learning on TLA is fun	ATI1
TLA provides a pleasant way to learn	ATI2
I feel happy & satisfied using TLA	ATI3
I like using TLA	ATI4
SECTION - IV Intention to use (ITU)	
I am willing to use TLA	ITU1
I am Planning to use TLA in future	ITU2
I will recommend others to use TLA	ITU3

Data analysis

Chart-2: Research Model for Teaching-learning application acceptance

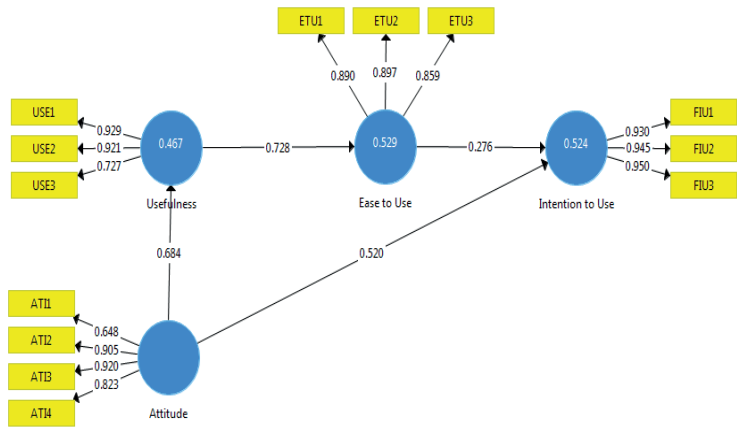


Table-2: Demographics of Respondents

Demographics	Frequency	Percentage
Gender		
Male	52	40
Female	78	60
Age		
Below 20	18	14
20 to 40	108	83
Above 40	04	03
Experience of TLA (Teaching-learning Application)		
Yes	72	55
No	58	45

Status (Key Stakeholders of Education)		
School Student	04	03
College Student	50	38
Pursuing Professional Course	10	08
Preparing for competitive exams	21	16
Teacher/Professor	30	23
Other	15	12

Table-2 indicates that valid responses include 52 male (40 per cent) and 78 female (60 per cent) respondents. The Majority of participants were between 20 to 40 years, with 108 responses (80 per cent). Participants having experience in teaching-learning applications are 55 per cent while those not having experience are 45 per cent. The majority of the respondents are college students (38 per cent), and then comes the teachers/professors (23 per cent).

Table-3: Path Coefficient

	Attitude	Ease of Use	Intention to Use	Usefulness
Attitude			0.520	0.684
Ease of Use			0.276	
Intention to Use				
Usefulness		0.728		
<i>Indirect Effect</i>				
Attitude		0.497	0.137	
Ease of Use				
Intention to Use				
Usefulness			0.201	
<i>Total Effect</i>				
Attitude		0.497	0.657	0.684
Ease of Use			0.276	
Intention to Use				
Usefulness		0.728	0.201	

Table-3 indicates that usefulness has the strongest effect on ease of use (0.728). These two constructs explain 52.9 per cent of the variance of the endogenous construct ease of use ($R^2 = .0529$). Then Attitude has a significant effect on the usefulness (0.684) and intention to use (0.520).

Table-4: Outer Loadings

Indicators	Attitude	Ease of Use	Intention to Use	Usefulness
ATI1	0.648			
ATI2	0.905			
ATI3	0.920			
ATI4	0.823			
EOU2		0.890		
EOU2		0.897		
EOU3		0.859		
ITU1			0.930	
ITU2			0.945	
ITU3			0.950	
USF1				0.929
USF2				0.921
USF3				0.727

Table-4 indicates that all outer loadings of the reflective constructs EOU, ITU, and USF are above the threshold value of 0.70, which suggests sufficient levels of indicator reliability.

Table-5: R Square

	R Square	R Square Adjusted
Ease of Use	0.529	0.520
Intention to Use	0.524	0.505
Usefulness	0.467	0.457

Table-5 presents the value of R-square for dependent variables. The usefulness variable is nearby 0.40 which indicates weak predictive accuracy of the model. Ease of use and Intention to use variables are above 0.50 which indicates moderate predictive accuracy of the model. The R square value of 0.25, 0.50, and 0.75 describes the substantial, moderate, and weak predictive accuracy of the model.

Table-6: F Square

	Attitude	Ease of Use	Intention to Use	Usefulness
Attitude			0.351	0.877
Ease of Use			0.099	
Intention to Use				
Usefulness		1.125		

Table-6 indicates the effect size of the constructs. The constructs with F-square ≥ 0.02 , F-square ≥ 0.15 and F-square ≥ 0.35 represent weak, moderate, and strong effects, respectively (Cohen, 1988).

Table-7: Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Attitude	0.848	0.891	0.898	0.691
Ease of Use	0.859	0.873	0.913	0.778
Intention to Use	0.936	0.939	0.959	0.887
Usefulness	0.827	0.866	0.897	0.747

Table-7 evinces the construct reliability and validity through internal consistency and convergent validity of constructs. The internal consistency and validity of the construct are measured from Cronbach's alpha, composite reliability, and AVE. The Cronbach's alpha of all the constructs suggests an adequate level of internal consistency (Yusoff, 2012). The composite reliability of all the constructs exceeds 0.07 (Hair et al., 2014) which is also adequate. The average variance extracted is more than 0.50 for all the constructs that indicate satisfactory convergent validity of constructs (Hair et al., 2010)

Table-8: Discriminant Validity - (Fornell-Larcker Criterion)

	Attitude	Ease of Use	Intention to Use	Usefulness
Attitude	0.831			
Ease of Use	0.618	0.882		
Intention to Use	0.691	0.597	0.942	
Usefulness	0.684	0.728	0.756	0.864
<i>Discriminant Validity - (Cross Loadings)</i>				
ATI1	0.648	0.325	0.341	0.356
ATI2	0.905	0.581	0.628	0.553
ATI3	0.920	0.606	0.690	0.682
ATI4	0.823	0.488	0.566	0.618
ETU1	0.531	0.890	0.497	0.547
ETU2	0.556	0.897	0.502	0.562
ETU3	0.544	0.859	0.567	0.774
FIU1	0.674	0.562	0.930	0.735
FIU2	0.596	0.550	0.945	0.689
FIU3	0.677	0.575	0.950	0.711
USE1	0.707	0.662	0.805	0.929
USE2	0.663	0.647	0.625	0.921
USE3	0.345	0.582	0.499	0.727

<i>Discriminant Validity - (Heterotrait-Monotrait Ratio)</i>				
Attitude				
Ease of Use	0.705			
Intention to Use	0.751	0.658		
Usefulness	0.775	0.846	0.864	

Table-8 presents the discriminant validity of all the constructs using the Fornell Larcker criteria, cross-loadings, and Heterotrait-Monotrait Ratio and these all are adequate and satisfactory according to thresholds (Hensler et al., 2009) (Chin, 1998) (Hair et al., 2010) (Hulland, 1999). As per the Fornell Larcker Criterion the square roots of the AVEs for the reflective constructs Attitude (0.831), Ease of use(0.882), Intention to use (0.942) and Usefulness (0.864) are all higher than the correlations of these constructs with other latent variables in the path

model, thus indicating all constructs are valid measures of unique concepts. This table also shows the loadings and cross-loadings for every indicator. The indicator ATI3 has the highest value for the loading with its corresponding construct ATI (0.920), while all cross-loadings with other constructs are considerably lower and the same approach is followed for other indicators also. The HTMT ratio indicates all values below 0.90, therefore the discriminant validity has been established between constructs. (Hensler et al., 2015).

Table-9: VIF – Variance Inflation factor – Collinearity Statistics (Outer VIF Values)

	VIF
ATI1	1.798
ATI2	3.482
ATI3	3.335
ATI4	2.196
ETU1	3.093
ETU2	3.179
ETU3	1.658
FIU1	3.385
FIU2	4.701
FIU3	4.754
USE1	3.309
USE2	3.228
USE3	1.397

Table-9 presents the variance inflation factor that is VIF, which shows the multicollinearity that states the correlation of variables with other predictors. We conclude, therefore, that

collinearity does not reach critical levels in any of the formative constructs and is not an issue for the estimation of the PLS path model.

Table-10: Model Fit (Fit Summary)

	Saturated Model	Estimated Model
SRMR	0.090	0.108
d_ULS	0.729	1.059
d_G	0.652	0.721
Chi-Square	175.683	181.431
NFI	0.732	0.723
<i>Model Fit (rms Theta)</i>		0.276

Table-11: Bootstrapping Path Coefficients (Mean, STDEV, T-Values, P- Values)

		Original Sample	Sample Mean	Standard Deviation	T statistics	P values
ATI	ITU	0.520	0.520	0.132	3.953	0.000
ATI	USE	0.684	0.701	0.077	8.848	0.000
ETU	ITU	0.276	0.276	0.122	2.256	0.024
USE	ETU	0.728	0.743	0.062	11.655	0.000

Table-12: Path Coefficient (Confidence Intervals Bias Corrected)

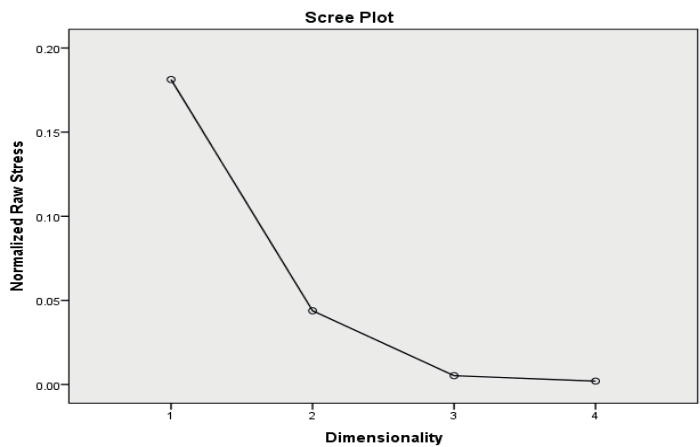
		Original Sample	Sample Mean	Bias	2.5%	97.5%
ATI	ITU	0.520	0.520	-0.000	0.271	0.771
ATI	USE	0.684	0.701	0.017	0.536	0.833
ETU	ITU	0.276	0.276	0.000	0.037	0.502
USE	ETU	0.728	0.743	0.015	0.603	0.846

Tables-11 & 12 show the mean, STDEV, P values, confidence intervals, and confidence intervals bias-corrected. Assuming a 2.5 per cent significance level, we find that all relationships in the structural model are significant.

Table-13: Goodness of Fit

Stress and Fit Measures	
Normalized Raw Stress	.18129
Stress-I	.42578 ^g
Stress-II	.89766 ^g
S-Stress	.36900 ^h
Dispersion Accounted For (D.A.F.)	.81871
Tucker's Coefficient of Congruence	.90483
PROXSCAL minimizes Normalized Raw Stress.	
g. Optimal scaling factor = 1.221.	
h. Optimal scaling factor = .847.	

Chart-3: Scree Plot Diagram

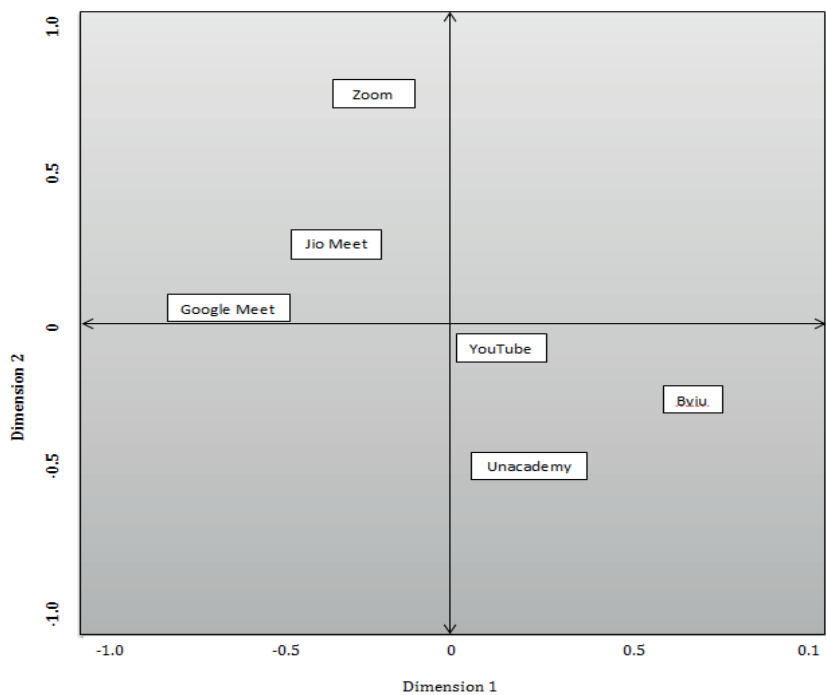


The data has been converted into proximities and a Scree plot (Chart 3) is prepared to know the number of dimensions that can accurately present the data. As the scree plot diagram shows that it can have two dimensions that present DAF (Table 20: Dispersion Accounted For) 0.8187. This means that these two identified dimensions can present 82 per cent of data if interpreted accurately. If three dimensions are presented then it becomes ambiguous to interpret the results therefore two-dimensional analysis has been selected.

Table-14: Final Coordinates

Final Coordinates		
	Dimension	
	1	2
Jio Meet	-.309	.237
Zoom	-.247	.741
Google Meet	-.675	.025
YouTube	.124	-.109
Unacademy	.333	-.569
Byju	.773	-.326

Chart-4: Common Space - Perceptual Map of Teaching-Learning participants for the preference for Teaching-Learning Platforms



From the study of the goodness of fit table and the chart of a scree plot diagram, two-dimensional analysis has been selected. A common plot and Final Coordinates for two dimensions are prepared. Which are presented in Table 14: Final Coordinates and Chart 4: Perceptual Map of participants for the preference for teaching-learning platforms. Considering the values of different teaching-learning platforms, dimension one is named Active Experience, and dimension number two is Complete Course Content. The data indicates that while preferring teaching-learning platforms the two attributes or dimensions which are considered by users are dimension 1 Active Experience and dimensions 2 Complete Course Content.

Managerial Implications

The EduTech service providers shall focus on building and creating a positive

attitude of the key stakeholders of education towards the platforms by offering ease of use and comfort to them. This will have a greater impact on the intention to use the EduTeh Platforms for the stakeholders. The existing and potential teaching-learning service provider platforms shall offer active experience and complete course content to the stakeholders of education to capture a larger market and satisfy them.

Findings and Conclusion

The main aim of the study is to know the perception and acceptance of EduTech applications among students, educators, and others. The study made a preliminary analysis of the reliability and discriminant validity of our model's measurement scale using Cronbach's Alpha, rho_A, Composite reliability, Fornell-larcker criterion,

and heterotrait-monotrait ratio, etc. Research models satisfy all the criteria of these parameters.

The finding illustrates that the ease to use and attitude toward using have a significant direct influence on the intention to use teaching-learning applications. Attitude towards using has a significant influence on the usefulness and usefulness has a significant indirect influence on the intention to use teaching-learning applications. Teaching-learning applications developers can focus more on the ease-of-use criteria of applications and attitude has a major effect directly and indirectly on the intention to use the applications, so EduTech platforms have to give the users that kind of comfort that switch their attitude towards traditional methods of learning to modern online sources of teaching and learning. During COVID-19 Pandemic, these platforms play a prominent role in continuing the study without classrooms and after the lockdown period, now people are comfortable with these online platforms and the opportunity is here, those platforms create more user-friendly, easy to use, and provide quality knowledge, it can acquire major online market.

The perceptual map presents that on the Active Experience dimension

the Byju is least preferable and the Google Meet is highly preferable by the teaching-learning participants. On the second dimension i.e., Complete Course Content the Zoom is least preferable and the Unacademy is highly preferable by the users. From the above data, it can be concluded that the teaching-learning participants prefer platforms that offer active experience and complete course content. Thus, to capture the large market and satisfy participants, the existing and potential EduTech or teaching-learning platforms must provide active experience and complete course content to the participants. During the present era, it is important to use information and communication technology (ICT) technologies to support e-learning in education. E-learning has been defined as learning and teaching facilitated online through network technologies with no barriers of time and place (NGai, Poon, & Chan, 2007). E-learning environments reduce the cost of provision and therefore increase revenues for academic institutions (Ho & Dzung, 2010). They also provide students more study flexibility and improve their learning experience and performance (Christie & Ferdos, 2004). Nowadays, Technology is the future. The education system and sources of learning are also going to change over the period. So, EduTech applications are the future of the e-learning system.

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