International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

E-Learning Products Adoption by Sem and CMB Multivariate Technique of Data Mining

[1]Sri Tulasi T., [2]Inayath Ahamed S. B.

Submitted: 11/12/2023 **Revised**: 27/01/2024 **Accepted**: 03/02/2024

Abstract: The contemporary education landscape has witnessed a rapid surge in the utilization of e-learning products, ushering in new possibilities for accessible and flexible learning experiences. However, the successful adoption of these products hinges upon overcoming diverse marketing challenges. This study delves into the intricate interplay between marketing challenges associated with e-learning products and their subsequent impact on adoption intentions. Through an extensive exploration of perceived quality and credibility, technical obstacles, pricing strategies, lack of awareness, and learner engagement, this research sheds light on the multifaceted hurdles that impede the effective promotion of e-learning solutions. By employing a comprehensive analysis, the study reveals a profound relationship between these challenges and the intentions of learners to embrace e-learning products. The findings underscore the necessity for targeted strategies to navigate these challenges, fostering an environment conducive to wider e-learning adoption and the evolution of education paradigms. The research unveiled that the primary marketing obstacles linked to e-learning products encompass perceived quality and credibility, technical hurdles, pricing strategies, lack of awareness, and learner engagement. Moreover, the findings conclusively substantiated a noteworthy influence of these factors on the intentions of adopting e-learning products.

Keywords: *Marketing challenges, e-learning, adoption*

1. Introduction:

The rapid proliferation of digital technology has ushered in a new era of learning and education, transforming the way knowledge is disseminated and acquired. E-learning, characterized by its flexibility, accessibility, and interactivity, has emerged as a powerful alternative to traditional classroom-based education. The increase in the use of technology in education had altered educators' attitudes from the traditional ones when they were distributors of knowledge to a new and more flexible attitude now that they are considered more as supporters and motivators who urge and encourage students to participate and learn (Onyema et al., 2019). E-learning refers to the integration and utilisation of information technology tools such as computers, software and internet in the process of teaching and learning in education (Igbokwe et al., 2020). Kyari et al. (2018:1) define it as the "use of the Internet, intranets/extranets, audio and videotape, satellite broadcast, and interactive television, not only for content delivery but also for interaction among participants".

As the world becomes increasingly interconnected and reliant on digital solutions, the e-learning industry has witnessed unprecedented growth and innovation. The use of information technology is on the rise in the education sector and mobile devices along with the Internet are widely spread among students. Thus, e-learning system has easily taken place as an important tool in universities. Additionally, positive interest is seen among students from the perspective of acceptance and adoption of online-based e-learning (Humida et al., 2022). Revenue in the Online Education market is projected to reach US$167bn in 2023 and expected to reach US$239bn by 2027 with CAGR of 9.48% (Statista, 2023). E-learning products encompass a diverse range of digital resources, including online courses, virtual classrooms, webinars, and interactive tutorials, designed to cater to the diverse learning needs of a global audience.

The advent of information and communications technology (ICT) has brought about significant transformations and reconfigurations across various facets of contemporary existence. The field of education has experienced significant impact from Information and Communication Technology (ICT), primarily through the incorporation of various technological tools utilised for educational objectives, including computers, the Internet, and mobile technology. Online learning is sometimes characterised as the utilisation of electronic devices with Internet connectivity to participate in an educational process that is not limited by physical location or time constraints. The utilisation of learning management systems is a viable strategy for engaging in online learning. Learning management systems (LMS) are comprehensive platforms that provide a diverse range of

[1]*Department of Business Administration, Kalasalingam Business School, Kalasalingam Academy of Research and Education, Krishnankoil 626126, Tamil Nadu, India*
Email: tsritulasi@gmail.com
[2]*Department of Business Administration, Kalasalingam Business School, Kalasalingam Academy of Research and Education, Krishnankoil 626126, Tamil Nadu, India*
Email: inayathahamed@klu.ac.in

integrated tools for the facilitation and administration of online training. The adoption of learning management systems (LMSes) as a means to support educational endeavours has become a prevalent phenomenon in higher education institutions. Higher education institutions employ Learning Management Systems (LMSes) as a means to complement in-person learning sessions, facilitate blended instruction, and provide support for remote learning.While quality content and innovative features are essential for delivering a meaningful learning experience, they won't reach their potential if they're not effectively communicated to the target audience. This is where marketing steps in as a crucial enabler. Effective promotion and marketing strategies ensure that potential learners are aware of the product's existence, understand its benefits, and are motivated to engage with it. However, the e-learning landscape is not devoid of challenges in this regard. The marketing of e-learning products presents a unique set of hurdles that demand attention and investigation. As educational institutions, edtech startups, and online platforms strive to attract and retain learners in an increasingly competitive digital space, understanding and addressing these challenges become imperative. Gartner report (2022) mentioned that eLearning Company should spend 6.4% to 9.5% on their marketing budgets for stable market position.

As highlighted by Al-Drees et al. (2011), understanding marketing challenges, including factors such as perceived quality, technical complexities, pricing strategies, lack of awareness, and learner engagement, is critical for optimizing the adoption process. For instance, Liaw (2008) emphasizes that perceived quality and credibility are central factors influencing learners' intentions to adopt e-learning systems. Addressing these challenges not only leads to increased adoption rates but also enhances user satisfaction, as noted by Chen et al. (2018), by creating a conducive environment for engaging and effective digital learning experiences.

Students are at the heart of the education process, and understanding their perceptions, preferences, and barriers is crucial for tailoring marketing strategies that resonate with their needs. By delving into these challenges from the student viewpoint, educators and e-learning providers gain insights that enable them to create targeted, user-centric approaches. This, in turn, enhances adoption rates and engagement levels, ultimately leading to improved learning outcomes. By addressing issues such as pricing concerns, perceived quality, and learner engagement, education stakeholders can align e-learning products more closely with student expectations, building trust, and encouraging active participation. Moreover, a comprehensive understanding of marketing challenges empowers students to make informed decisions, ensuring they select the products that best suit their learning goals.

This study aims to fill a gap in the existing literature by systematically examining the interplay between marketing challenges and adoption intention within the e-learning context. The findings of this research could potentially offer valuable insights for educators, e-learning platforms, marketers, and policymakers alike. By gaining a deeper understanding of the challenges that affect the promotion of e-learning products and their subsequent influence on adoption intention, stakeholders can develop more tailored strategies to overcome these challenges and enhance the overall adoption of e-learning solutions.

Research Objectives:

- To identify various challenges associated with marketing of e-learning products.
- To study impact of marketing challenges of e-learning products on their adoption intention.

The first objective of this study is to delve into the myriad challenges that emerge during the marketing of e-learning products. These challenges span a wide spectrum, encompassing issues related to target audience identification, competition, technological infrastructure, pricing strategies, communication channels, and more. An in-depth exploration of these challenges can provide a comprehensive view of the obstacles that marketers encounter while promoting e-learning offerings.

The second objective of the study focuses on the critical link between marketing challenges and the adoption intention of e-learning products. Adoption intention, a precursor to actual adoption, reflects the inclination and willingness of potential users to embrace e-learning solutions. It is hypothesized that the challenges faced in marketing e-learning products could have a significant impact on users' adoption intention. For instance, if potential learners perceive barriers or difficulties in accessing information about e-learning courses or find the promotional messages unconvincing, their intention to adopt these products might be hindered.

2. Literature Review

According to Nasscom (2018), e-learning, also known as online education, accounts for the majority of EdTech's revenue. To put it simply, e-learning is instruction delivered via the World Wide Web. Learning and course material can now be accessed anywhere, not just in classrooms (HolonIQ, 2021). There are many advantages to e-learning, including its portability, cost-effectiveness, regular updates, adaptability, and simplicity in tracking students' development. In addition, the demographics of the online learning audience are extremely diverse, spanning from young children to older adults and working professionals (KPMG, 2017).

Self-education is encouraged through e-learning, and the availability of small, high-quality educational institutions makes this a viable option. As a result of the widespread availability of online resources, today's students are no longer limited to classrooms within their immediate geographic area. There are numerous advantages to e-learning, including: (1) It facilitates communication with the parties, regardless of their physical location, through the use of a conversations room, digital classroom, and email. (2) There is no set schedule because teachers are available outside of regular business hours, contributing to the resources' availability around the clock. Third, everyone has the opportunity to learn, within the constraints of their own schedules and commitments (Abed, 2019).

In traditional classrooms, students who felt less confident often did not speak up or ask questions; in e-learning, however, they have a forum where they can send questions via email and discuss one-on-one as well (Sharp, 2000). According to Baiyere and Li (2016), education is the primary and most significant driving force behind any country's prosperity. Closing and suspending schools as a result of COVID-19 was a major setback for the education system. The education sector was also left defenceless as a result of the unexpected halt. Educators in this era have been experimenting with and using a wide range of digital tools in order to better serve their students.

E-learning and online universities provided an advantage over more conventional approaches at this time (Alsoud and Harasis, 2021). The educational system is still struggling to recover from the crisis that COVID-19 caused. The globe has encountered several obstacles in recent years, including the one-to-one education challenge and the virtual education challenge (Edelhauser & Lupu-Dima, 2020). The COVID-19 epidemic in the first half of 2020 was a watershed moment for India's e-learning industry (Inc42 Data Labs, 2020). Institutions of higher learning and their students were driven by the pandemic to turn to online continuing education courses. As a result, it is more crucial than ever to examine how students feel about e-learning and what elements can increase their willingness to use it. Few studies have been conducted on this subject, especially those that (1) take the pandemic's effects into account and (2) aim for a wider audience, one that includes adult students.

2.1 Conceptual and Theoretical background:

Adoption intentions

E-learning products adoption intention can be defined as the predisposition and conscious inclination of individuals to embrace and utilize digital learning solutions within educational contexts. This intention signifies an individual's readiness to engage with technology-mediated educational resources, reflecting their assessment of perceived benefits, usability, and alignment with personal learning goals. It encompasses the cognitive processes of evaluating the advantages and potential barriers associated with adopting e-learning products. This definition draws from psychological and motivational factors that influence an individual's decision-making process, including perceived value, self-efficacy, and external influences**.**

This concept aligns with the Technology Acceptance Model (TAM), which emphasizes the role of perceived ease of use and perceived usefulness in shaping users' intentions to adopt technology. Davis (1989) introduced this model, underscoring how users' perceptions of a technology's ease of use and its potential to enhance their tasks influence their adoption intentions. In the context of e-learning, perceived ease of use and usefulness play a pivotal role in shaping users' intentions to adopt digital educational solutions.

E-learning can be regarded as an information system, and hence, its adoption can be evaluated in a manner similar to that of other information systems or technologies. The acceptance of a technology system can be regarded as an indicator of its success. One way to approach this is through the lens of the Unified Theory of Acceptance and Use of Technology (UTAUT) framework (Venkatesh et al. in 2016). The adapted UTAUT framework incorporates factors related to performance expectations, effort expectations, social influence, facilitating conditions, and individual characteristics.

Marketing challenges

Perceived Quality and Credibility: refer to the subjective assessment that learners make regarding the overall excellence, authenticity, and reliability of the educational content, platform, and resources offered. Perceived quality encompasses factors such as the relevance of content, instructional design, multimedia elements, and overall presentation. Credibility, on the other hand, pertains to the legitimacy and trustworthiness of the e-learning product and its sources.

Technical Challenges: Technical barriers, such as difficulties in navigating the platform, poor user interface design, compatibility issues, and slow loading times, can discourage learners from engaging with e-learning products.

Pricing Strategies: Pricing is a critical factor that influences adoption. E-learning products need to strike a balance between affordability and perceived value. If the cost is too high in relation to perceived benefits, potential users might opt for alternative learning methods. Pricing strategies must consider factors like course content,

features, certifications, and the target audience's financial capacity.

Lack of awareness: The term "lack of awareness" pertains to a scenario in which potential learners, educational institutions, or target audiences possess inadequate knowledge or are uninformed of the presence, advantages, characteristics, and significance of particular digital learning solutions. This situation refers to a circumstance in which providers of e-learning have failed to adequately convey or promote their offerings to the target audience, leading to a restricted comprehension of the products' capabilities and their potential contribution to learners' educational objectives (Nwana et al., 2017).

Learner Engagement for e-learning products involves the extent to which students actively participate, interact, and invest their attention, effort, and enthusiasm in the learning process facilitated by digital educational resources and platforms. It encompasses a range of cognitive, emotional, and behavioral activities that demonstrate the depth of learners' involvement and commitment to their learning experiences (Gligorea et al., 2021).

2.2 Hypothesis development Marketing challenges and e-learning product adoption intentions:

Alam et al. (2020), who emphasize that perceived value and affordability are crucial factors that determine users' willingness to adopt e-learning solutions. Chen et al. (2018) underscored the significance of student engagement as a pivotal determinant in forecasting the adoption of e-learning. According to Kapp (2012), the incorporation of gamified components, interactive dialogues, and multimedia information has the potential to augment engagement levels, hence exerting a beneficial influence on the rates of adoption. According to a study conducted by Chao (2010), one of the obstacles hindering the adoption of e-learning among students was a lack of awareness.

According to Bhuasiri et al. (2012), the implementation of effective marketing tactics, such as focused social media campaigns or collaborations with educators, has the potential to enhance awareness and foster the acceptance of a particular product or service. Based on a survey conducted among college students in Vietnam, the determinants of online learning service quality mostly consist of the quality of the e-learning system, the competence of e-learning instructors and the quality of course materials, as well as the effectiveness of e-learning administration and support services (Pham et al., 2019).

Research by Mtebe and Raphael (2019) highlighted the importance of user-friendly interfaces in e-learning systems. Students' satisfaction with usability and technical performance influences their willingness to use these products (Liaw et al., 2008). A study by Mtebe and Kissaka (2015) highlighted that affordability was a significant factor influencing students' decisions to adopt e-learning. Students often assess the perceived value of the product against its cost (Liaw, 2008). Pricing strategies that strike a balance between affordability and perceived value can positively impact adoption rates.

Based on above discussion the current study formulated following hypotheses:

Null hypothesis: There is no significant influence of marketing challenges of e-learning products on their adoption intention.

Alternate hypothesis:

H1: Balancing pricing strategies of e-learning products significantly influences their adoption intention.

H2: Perceived quality & credibility of e-learning products significantly influences their adoption intention.

H3: Technical challenges associated with e-learning products significantly influences their adoption intention.

H4: Learner engagement associated with e-learning products significantly influences their adoption intention.

H5: Lack of awareness towards e-learning products significantly influences their adoption intention.

3. Methodology:

The research employed a quantitative methodology to gather data, utilizing a cross-sectional survey and a convenience sample administered through a Google form. The study comprised a sample of students from various universities in ……who were enrolled in online courses at both the graduate and postgraduate levels. In order to solicit student participation for data collection, the survey link was sent among students via the WhatsApp groups administered by their various instructors. The students were asked to give their response for research constructs on a five-point Likert scale with a 1–5 rating: strongly disagree (1), disagree (2), do not know (3), agree (4) and strongly agree (5). Finally, 247 data were selected for final analysis and their demographic details presents in table 1.

3.1 Technique of data analysis

The present investigation utilized a blend of descriptive and inferential statistics to achieve the research objectives. The descriptive statistics were calculated utilizing various measures, including the mean, standard deviation, percentage, and frequency.

The main software utilized in this research consists of the Statistical Package for the Social Sciences (SPSS) and AMOS version 24. A preliminary investigation utilizing exploratory factor analysis (EFA) was conducted to ascertain the fundamental framework of a provided

dataset. After the study's factors were completed, Confirmatory Factor Analysis (CFA) was employed to evaluate the suitability of the proposed scale for the study. The study was concluded by employing Structural Equation Modelling (SEM), which is a multivariate technique that enables the estimation of relationships between all the variables under investigation by simultaneously analyzing multiple regression equations.

4. Data Analysis and Results:

4.1 Demographic Information:

Table 1: Demographic information about the respondents (N=247)

		Frequency	Percent
Gender	Male	132	53.4
	Female	115	46.6
Age	18-22 years	145	58.6
	23-26 years	62	25.3
	27 and above	40	16.1
Education	Undergraduate	128	51.7
	Postgraduate	119	48.3

The analysis of participant demographics reveals several notable patterns. In terms of gender distribution, the study includes 132 male participants (53.4%) and 115 female participants (46.6%), indicating a relatively balanced gender representation. Regarding age, the majority of respondents fall within the 18-22 years bracket, accounting for 58.6% of the total sample. Participants aged 23-26 years constitute 25.3% of the sample, while those aged 27 and above comprise 16.1%, showcasing a diverse range of age groups. In terms of education, the study encompasses a mix of participants, with 51.7% being undergraduates and 48.3% holding postgraduate degrees.

4.2 Normality, Common method bias and Multicollinearity

Prior to conducting structural equation modelling (SEM), it is imperative to assess the normality assumption of the data by scrutinising the skewness and kurtosis values. According to the findings presented in Table 2, the observed values fall within the range of -2 and +2, suggesting that the data meets the normality assumption (Hair et al., 2010).

The potential occurrence of common method bias (CMB) in the data could be influenced by the fact that each participant autonomously completed the questionnaire. The utilisation of this particular independent completion method may potentially result in bias as a consequence of shared method variance. This occurs when respondents unintentionally provide consistent responses throughout the various items in the questionnaire (Cai et al., 2017). A Harman one-factor test was used to analyse how CMB affected the outcomes (Podsakoff et al., 2012). To do this, all items were combined into a single unrotated construct and analysed using the principal component approach in an exploratory factor analysis. Below the 50% threshold, the single extracted factor accounts for 37.68% of the total variation. This shows that the variance in our sample was not primarily explained by the single component. According to the findings, CMB does not present a substantial threat in the context of this investigation.

It is important to acknowledge that high multicollinearity among variables can distort the obtained results (Gujarati and Porter, 2010). To assess multicollinearity, variance inflation factors (VIF) were utilized as a diagnostic tool. The observed VIF values ranged from 1.114 to 2.629, indicating the absence of significant multicollinearity concerns. These values, as reported by Kock (2015), were all below the threshold of 3.3.

4.3 Scale Validation:

The current study used factor analysis with principal component analysis using varimax rotation method. The sample adequacy was tested using Kaiser- Meyer-Olkin for current sample KMO = 0.889 with significant Bartlett's sphericity test confirmed sample is good enough to run further analysis. Factors having Eigen values above 1 were considered for analysis and finally 6 factors were extracted which are able to explain 72.54% of total variance.

After exploratory factor analysis, CFA was performed on six factors, by considering all exogenous constructs. The fit indices of the measurement model indicates that good indicators such as Chi-square/degree of freedom (CMIN/df) =2.024 {<=3}, Adjusted Goodness of Fit Index (AGFI) = 0.870 {>=0.80}: Comparative Fit Index (CFI) = 0.962 {>=0.90} and Normalized Fit Index (NFI) = 0.928 {>=0.90} all are above the threshold criteria. The Root Mean Square of Approximation (RMSEA) value of 0.062 is also found to be below the threshold limit of 0.08, as indicated by Hair et al. (2010).

Table 2: Factor loadings and Cronbach's alpha values

Constructs	**Items**	**Loadings**	**Skewness**	**Kurtosis**	**Alpha value**
Perceived quality & credibility	PQC1	.844	.790	.323	0.914
	PQC3	.852	.585	-.027	
	PQC2	.838	.528	-.024	
Balancing price strategies	BPS1	.867	1.173	2.014	0.903
	BPS2	.806	.947	.968	
	BPS3	.869	1.207	1.618	
Learner engagement	LE1	.853	1.173	1.146	0.891
	LE2	.859	1.237	1.434	
	LE	.704	1.301	1.614	
	LE4	.851	1.433	1.831	
Technical challenges	TC1	.823	1.314	1.312	0.893
	TC2	.747	1.636	2.026	
	TC3	.761	1.418	1.341	
	TC4	.758	1.498	1.827	
Lack of awareness	LA1	.835	1.245	2.058	0.833
	LA2	.601	3.119	3.793	
	LA3	.866	1.141	2.333	
	LA4	.904	.761	.840	
e-learning Adoption intention	AI1	.730	1.380	2.123	0.850
	AI2	.812	1.490	1.361	
	AI3	.793	1.679	1.247	

The analysis of the constructs reveals several key findings. In the "Perceived quality & credibility" construct, items PQC1, PQC2, and PQC3 demonstrate strong loadings (0.844, 0.838, and 0.852, respectively), indicating that participants perceive e-learning products as having high quality and credibility. The "Balancing price strategies" construct is also well-defined, with items BPS1, BPS2, and BPS3 exhibiting substantial loadings (0.867, 0.806, and 0.869, respectively), suggesting that pricing strategies are carefully considered. The "Learner engagement" construct shows strong loadings for all items (ranging from 0.704 to 0.859), indicating that participants find e-learning engaging. Similarly, the "Technical challenges" construct demonstrates good internal consistency (Cronbach's alpha = 0.893) and highlights specific technical hurdles associated with e-learning. Notably, the "Lack of awareness" construct displays (cronbach's alpha=0.833) indicating that participants perceive e-learning products as having high quality and credibility. Lastly, the "e-learning Adoption intention" construct's items (AI1, AI2, and AI3) exhibit respectable loadings (ranging from 0.730 to 0.812), indicating a positive intention to adopt e-learning. Overall, the study's constructs demonstrate sound internal reliability and

provide valuable insights into participants' perceptions of e-learning product quality, pricing, engagement, technical challenges, awareness, and adoption intention. Further investigation is recommended to address potential data distribution concerns and validate the constructs' robustness.

Table 3: Results for construct reliability, validity and correlation coefficients

Construct	VIF	CR	AVE	MSV	Correlations					
					BPS	**PQC**	**TC**	**LE**	**LA**	**AI**
BPS	1.114	0.893	0.736	0.524	1					
PQC	1.277	0.943	0.847	0.301	.393**	1				
TC	2.629	0.916	0.731	0.645	.651**	.446**	1			
LE	2.444	0.907	0.709	0.645	.637**	.406**	.537**	1		
LA	1.954	0.835	0.630	0.168	.388**	.322**	.290**	.256**	1	
AI	-	0.851	0.656	0.573	.625**	.575**	.587**	.557**	.414**	1

**: Correlation significance <0.01

The correlations provide insights into the relationships between pairs of constructs. Notably, p (less than 0.01) significant positive correlations are observed between various constructs. For instance, Technical Competence (TC) shows strong correlations with Problem-solving and Quality Control (PQC), Leadership Effectiveness (LE), and Communication and Leadership Abilities (LA). This implies that individuals with higher technical competence tend to exhibit better performance in problem-solving, leadership, and communication.

The analysis suggests that the measurement model is reliable, valid, and the constructs are distinct from one another. The relationships between constructs, as indicated by correlations, offer valuable insights into how different skills and attributes might be interconnected. These findings contribute to a deeper understanding of the underlying factors and relationships within the dataset, which can be vital for making informed decisions or drawing meaningful conclusions in your study or research.

4.4 Hypotheses testing using SEM model

Structural Equation Modelling (SEM) is a statistical methodology used to assess and analyze complex relationships among variables within a theoretical framework. The current study employed Maximum Likelihood Estimation for SEM, due to its robustness and ability to handle various types of data distributions, as well as its strong theoretical foundation (Blunch, 2013).

The acceptance of research hypothesis is based on significance values and critical ratio (t-value) of particular path. When both the p-value is less than 0.05 and the t-value is greater than 1.96, researchers have strong evidence to support the acceptance of the research hypothesis represented by that specific path.

Based on results for path analysis and hypothesis testing as reported in table 4 and shown in figure 1, confirmed that all the marketing related challenges are influencing adoption intention for e-learning products. The standardized path coefficient i.e., β value for balancing pricing strategies to e-learning products adoption is 0.311 with p=0.000 & T= 4.876. Since the p value <0.05, hence hypothesis H1 was accepted. The influence of perceived quality & credibility on e-learning product adoption is positive and significant as p value <0.05, β value for this path is 0.301, confirming hypothesis H2.

Similarly, other marketing challenges associated with e-learning products such as technical challenges (β =0.374, p=0.000) , engagement of learners(β =0.323, p=0.000) and lack of awareness (β =0.210, p=0.001) have significant intention of adoption intention as p values for all these paths are less than 0.05, confirming the acceptance of hypotheses H3, 4 & 5 respectively.

The coefficient of determination for this structure model is 0.48, indicating all the five marketing challenges of e-learning products are able to explain 48% variation in adoption intention.

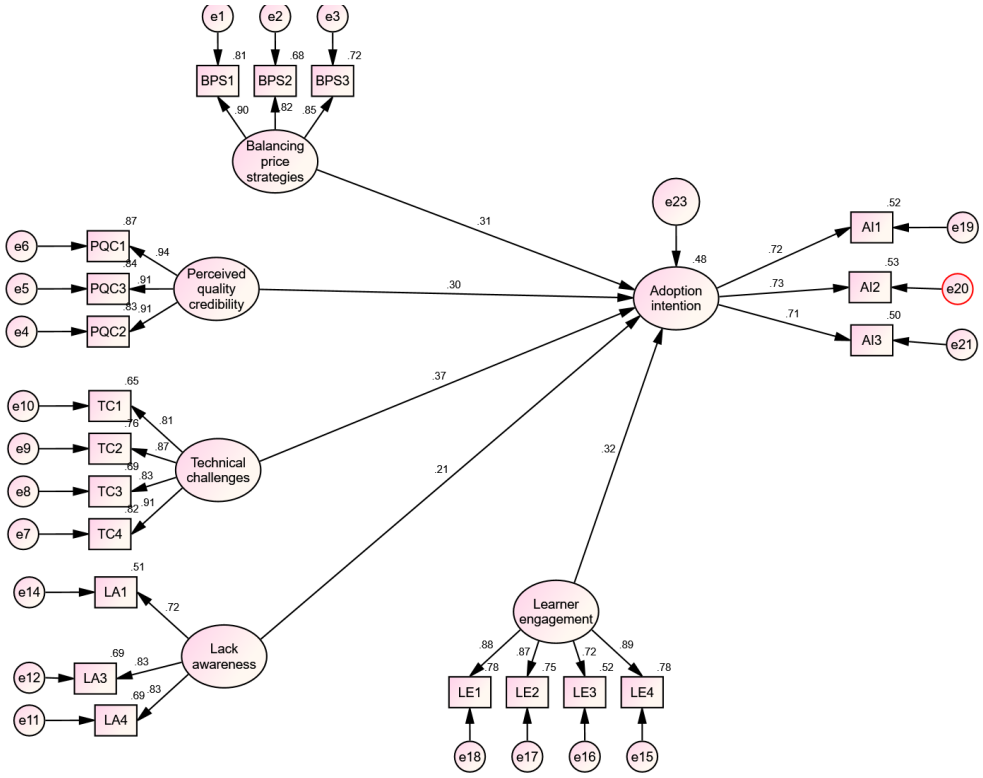

Fig 1: Casual structure for e-learning product adoption

Table 4.: Path coefficients for causal model and hypothesis result

	Path	**S.E.**	**C.R.**	**P**	**Path coefficient (β)**
H1	Balancing price strategies→ e-learning adoption intention	.048	4.876	***	0.311
H2	Perceived quality & credibility→ e-learning adoption intention	.035	4.866	***	0.301
H3	Technical challenges→ e-learning adoption intention	.036	5.811	***	0.374
H4	Learner engagement→ e-learning adoption intention	.037	5.091	***	0.323
H5	Lack of awareness→ e-learning adoption intention	.053	3.273	.001	0.210

*****: p<0.000**

The study aimed to investigate the factors influencing e-learning adoption intention. Through a comprehensive analysis of various paths and their respective path coefficients (β), several key insights have emerged.

Firstly, the balancing price strategies demonstrated a significant impact on e-learning adoption intention, with a path coefficient of 0.311. This suggests that the pricing strategies implemented by e-learning platforms play a crucial role in shaping individuals' intentions to adopt e-learning.

Secondly, perceived quality and credibility also exhibited a substantial influence on e-learning adoption intention, as indicated by a path coefficient of 0.301. This underscores the importance of individuals' perceptions of the quality and credibility of e-learning platforms in driving their adoption intentions.

Furthermore, technical challenges were found to be significantly associated with e-learning adoption intention, with a path coefficient of 0.374. This highlights that addressing technical obstacles can potentially enhance individuals' willingness to adopt e-learning.

Moreover, the impact of learner engagement on e-learning adoption intention was evident, with a path coefficient of 0.323. This suggests that creating engaging learning experiences can positively sway individuals towards adopting e-learning.

Interestingly, lack of awareness also showed a noteworthy effect on e-learning adoption intention, albeit with a relatively lower path coefficient of 0.210. This implies that efforts to increase awareness about the benefits and opportunities of e-learning could contribute to higher adoption rates.

5. Discussion and Implications:

The study identified marketing challenges associated with e-learning products are mainly: perceived quality and credibility, technical challenges, pricing strategies, lack of awareness, and learner engagement. The results further confirmed significant impact of all these factors on e-learning product adoption intentions.

Technical challenges are considered as most influencing factors by students while adopting e-learning products. This highlighted prioritizing user experience and usability are most important. It is required for companies to ensure that their e-learning platform is user-friendly, accessible across devices, and offers seamless navigation. Engaging learners significantly influence adoption intention towards e-learning products. These findings are helpful for e-learning providers to promote engagement through interactive design and engaging content that includes multimedia elements, quizzes, discussions, and gamified features. Offer personalized learning paths that cater to individual preferences and learning styles. Regularly update content to keep it fresh and relevant.

The current study proved that learner's adoption is impacted by pricing models provided by e-learning product suppliers. Determining the right pricing model for e-learning products is complex. Educational institutions and learners have varying budget constraints, and finding a pricing strategy that is both competitive and sustainable can be challenging. By offering flexible pricing options, demonstrating value, and aligning costs with students' budget constraints, e-learning providers can enhance their products' attractiveness and adoption rates.

The results confirm that lack of awareness towards e-learning products and suppliers affect their adoption intention. It is recommended for e-learning providers to increase their products awareness by developing a comprehensive marketing strategy that includes targeted social media campaigns, search engine optimization (SEO), and partnerships with educational influencers. Finally, the study concluded that focusing on enhancing quality, addressing technical concerns, raising awareness, and promoting engagement can result in higher adoption rates for e-learning products.

The study's findings collectively emphasize the multifaceted nature of e-learning adoption intention, with pricing strategies, perceived quality and credibility, technical challenges, learner engagement, and awareness all playing significant roles. These insights provide valuable guidance for e-learning platforms, educators, and policymakers seeking to enhance e-learning adoption rates by addressing these influential factors. It's important to note that these conclusions are based on the data and analysis conducted within the scope of this study, and future research may provide further nuanced insights into the dynamics of e-learning adoption.

6. Limitation:

Even though study has identified major marketing challenges associated with e-learning product and their impact on adoption intention. But the study has considered these challenges from students' perspective. Future research can consider response from e-learning product providers or educational intuitional. The future research can involve the role of moderating variables such as age, gender or education for checking the variations in challenges and their impact on adoption intentions.

7. Conclusion:

In conclusion, this study delved into the critical marketing challenges that exert significant influence on the adoption of e-learning products. Among the key challenges explored were perceived quality and credibility, technical challenges, pricing strategies, lack of awareness, and learner engagement. By comprehensively examining these marketing challenges, this study not only sheds light on the complexities inherent in the adoption of e-learning products but also underscores the significance of a holistic approach to addressing these challenges. Recognizing the interplay between perceived quality, technical feasibility, pricing strategies, awareness campaigns, and engagement dynamics is essential for e-learning product providers seeking to enhance their adoption rates.

In a rapidly evolving educational landscape, these findings provide valuable insights for e-learning product developers, educators, and policymakers. Crafting strategies that not only address these challenges but also leverage them as opportunities could prove pivotal in fostering the wider adoption of e-learning products. As technology continues to shape the educational sphere, acknowledging and mitigating these challenges will be instrumental in shaping a more inclusive and effective e-learning ecosystem.

References;

[1] Abed, E.K. (2019), "Electronic learning and its benefits in education", EURASIA Journal of Mathematics, Science and Technology Education, Vol. 15 No. 3, em1672.

[2] Alsoud, A.R. and Harasis, A.A. (2021), "The impact of covid-19 pandemic on student's e-learning experience in Jordan", Journal of Theoretical and Applied Electronic Commerce Research, Vol. 16 No. 5, pp. 1404-1414.

[3] Baiyere, A. and Li, H. (2016), "Application of a virtual collaborative environment in a teaching case", in AMCIS 2016: Surfing the IT Innovation Wave - 22nd Americas Conference on Information Systems.

[4] Baleghi-Zadeh, S., Ayub, A.F.M., Mahmud, R. and Daud, S.M. (2017), "The influence of system interactivity and technical support on learning management system utilization", Knowledge Management and E-Learning, Vol. 9 No. 1, pp. 50-68.

[5] Chen, S. Y., & Macredie, R. D. (2018). The Assessment of Learning Performances for Science and Engineering Higher Education Using an Intelligent Tutoring System. Computers & Education, 119, 110-128.

[6] Duggal, S. (2022). Factors impacting acceptance of e-learning in India: learners' perspective. Asian Association of Open Universities Journal, 17(2), 101–119. https://doi.org/10.1108/aaouj-01-2022-0010

[7] Gligorea, I., Bârsan, G., Oancea, R., & Moro, N. (2021). E-Learning Strategies to Improve the Students' Engagement. In International Conference Knowledge-Based Organization (Vol. 27, No. 3).

[8] HolonIQ (2021), "2021 global learning landscape", available at: https://www.globallearninglandscape.org/ (accessed 16 May 2021).

[9] Humida, T., Al Mamun, M. H., & Keikhosrokiani, P. (2022). Predicting behavioral intention to use e-learning system: A case-study in Begum Rokeya University, Rangpur, Bangladesh. Education and information technologies, 27(2), 2241-2265.

[10] Igbokwe, I. C., Okeke-James, N. J., Anyanwu, A. N., & Eli-Chukwu, N. C. (2020). Managing the challenges to the effective utilisation of e-learning as a response in COVID-19 Nigeria. International Studies in Educational Administration, 48(2), 28–34.

[11] KPMG (2017), "Online education in India: 2021", available at: https://assets.kpmg/content/dam/kpmg/in/pdf/2017/05/Online-Education-in-India-2021.pdf (accessed 16 May 2021).

[12] Mtebe, J. S., & Kissaka, M. M. (2015). Heuristics for evaluating usability of Learning Management Systems in Africa. *2015 IST-Africa Conference*.

[13] Nasscom (2018), "EdTech – the advent of digital education", available at: https://nasscom.in/knowledge-center/publications/edtech-advent-digital-education (accessed 16 May 2021).

[14] Nwana, S. E., Egbe, C. I., & Ugwuda, S. O. (2017). Awareness and Usage of E-Learning Materials among Students of National Open University of Nigeria (NOUN). World Journal of Education, 7(6), 75-79.

[15] Onyema, E. M., Ogechukwu, U., Anthonia, E. C. D., & Deborah, E. (2019). Potentials of mobile technologies in enhancing the effectiveness of inquiry-based learning approach. International Journal of Education (IJE), 2(01), 1-22.

[16] Pham, L., Limbu, Y. B., Bui, T. K., Nguyen, H. T., & Pham, H. T. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam. International Journal of Educational Technology in Higher Education, 16(1), 1-26.

[17] Sharp, S. (2000), "Internet usage in education for technology horizon in education", Vol. 27 No. 10, pp. 12-14.

[18] Venkatesh, V., Thong, J. & Xu, X. (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. Journal of the Association for Information Systems, 17 (5), 328-376