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ORIGINAL

Redefining Education in the Age of Covid-19: Exploring the Potential for E-learning Products

Redefiniendo la educación en la era del Covid-19: Explorando el potencial de los productos de aprendizaje en línea

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ABSTRACT

The COVID-19 pandemic ushered in profound changes in education, compelling institutions to navigate e-learning as a critical lifeline. This study aimed to investigate the perceptions and needs of students, the perspectives and requirements of faculty members, and the preparedness and outlook of educational institution management regarding e-learning adoption. A multifaceted exploration was conducted, focusing on undergraduate students, faculty members, and e-learning platform employees in Hyderabad city, India. Purposive sampling was used to select 395 students, 70 faculty members, and 50 employees. Data were collected through online questionnaires based on a Likert scale and analyzed using the SEM model, t-test, ANOVA, and regression analysis with SPSS-26. The research provided a comprehensive understanding of e-learning's potential during the COVID-19 pandemic. It addressed stakeholders' needs and concerns, offering insights into how e-learning could empower learners, enhance teaching, and create resilient educational systems. This study provides marketers with insights into the transformative potential of e-learning products amidst global educational shifts catalyzed by the COVID-19 pandemic, guiding them in developing tailored solutions that meet the evolving needs of students, faculty, and educational institutions.

Keywords: COVID-19; Education; Faculty; Students; Educational Institutions.

RESUMEN

La pandemia de COVID-19 ha provocado cambios profundos en la educación, obligando a las instituciones a adoptar el aprendizaje en línea como un recurso vital. Este estudio tuvo como objetivo investigar las percepciones y necesidades de los estudiantes, las perspectivas y requisitos de los miembros del profesorado, y la preparación y perspectiva de la gestión de las instituciones educativas con respecto a la adopción del aprendizaje en línea. Se realizó una exploración multifacética, centrándose en estudiantes de pregrado, miembros del profesorado y empleados de plataformas de aprendizaje en línea en la ciudad de Hyderabad, India. Se utilizó un muestreo intencional para seleccionar a 395 estudiantes, 70 miembros del profesorado y 50 empleados. Los datos se recopilaron mediante cuestionarios en línea basados en una escala Likert y se analizaron utilizando el modelo SEM, prueba t, ANOVA y análisis de regresión con SPSS-26. La investigación proporcionó una comprensión integral del potencial del aprendizaje en línea durante la pandemia de COVID-19. Abordó las necesidades y preocupaciones de los interesados, ofreciendo perspectivas sobre cómo el aprendizaje en línea podría empoderar a los estudiantes, mejorar la enseñanza y crear sistemas educativos resilientes. Este estudio proporciona a los especialistas en marketing una visión del potencial transformador de los productos de aprendizaje en línea en medio de los cambios educativos globales catalizados por la pandemia de COVID-19, guiándolos en el desarrollo de soluciones personalizadas que satisfagan las

necesidades cambiantes de estudiantes, profesores e instituciones educativas.

Palabras clave: COVID-19; Educación; Profesores; Estudiantes; Instituciones Educativas.

INTRODUCTION

The swift advancement of digital technology has significantly revolutionized the realm of education, changing the manner in which knowledge is imparted and acquired. E-learning, noted for its flexibility, accessibility, and interactive nature, has emerged as a robust alternative to traditional classroom settings. The increasing use of technology in education has shifted educators' roles from mere knowledge distributors to facilitators and motivators, encouraging active student participation and engagement.[1]

E-learning involves the integration and use of various information technology tools, including computers, software, and the internet, in educational processes.[2] According to Kyari et al., it encompasses 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".[3]

With the world becoming more interconnected and dependent on digital solutions, the e-learning sector has experienced significant growth and innovation. Information technology usage is on the rise in education, with mobile devices and the internet becoming prevalent among students. Consequently, e-learning systems have been widely adopted as essential tools in universities. Furthermore, there is a notable positive inclination among students towards the acceptance and adoption of online-based e-learning.[4]

The online education market is projected to generate revenue of $167 billion in 2024 and is expected to grow to $239 billion by 2027, with a compound annual growth rate (CAGR) of 9,48 %.[5] E-learning products include a wide range of digital resources such as online courses, virtual classrooms, webinars, and interactive tutorials, all designed to meet the diverse learning needs of a global audience.

Marketing e-learning products involves unique challenges that need careful consideration and research. As educational institutions, ed-tech startups, and online platforms compete to attract and retain learners in a crowded digital marketplace, understanding and addressing these challenges is crucial. According to a Gartner report, e-learning companies should allocate 6,4 % to 9,5 % of their marketing budgets to sustain a strong market position.[6]

The rapid growth and widespread adoption of e-learning, driven by advancements in digital technology and increasing acceptance among students and educators, underscore the significant potential and critical importance of e-learning products in transforming education, as explored in this study.

Literature Review

Student Perception Towards E-Learning Effectiveness

The effectiveness of e-learning platforms largely depends on how students perceive this mode of education.[7] Their attitudes, preferences, and overall satisfaction play a vital role in determining the success of online learning initiatives.[8] Exploring students' perspectives can shed light on the strengths and weaknesses of e-learning, allowing educational institutions to make informed improvements.[9]

Faculty's Attitude Towards the Effectiveness of Online Education

The role of educators in facilitating e-learning is pivotal.[10] Understanding the attitudes and opinions of faculty members towards online education is essential for evaluating its efficacy.[11] Their insights into instructional methods, technology integration, and overall pedagogical effectiveness are invaluable in shaping the future of e-learning.[12]

E-Learning Readiness from a Management Perspective:

Successful implementation of e-learning requires careful planning and management at the institutional level.[13] Institutions need to be well-prepared to provide the necessary resources, infrastructure, and support to ensure a seamless e-learning experience.[14] This study will examine e-learning readiness, focusing on the management perspective, to identify potential gaps and areas for improvement in the administration of e-learning platforms.[15]

This study examined the effectiveness of e-learning by exploring student perceptions, faculty attitudes, and management readiness, providing a comprehensive understanding essential for improving online education initiatives.

METHOD

The study was exploratory in nature, focusing on the transformative potential of e-learning products. It aimed to gather insights from various stakeholders in the education sector, including students, faculty members,

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and e-learning platform employees.

This exploratory study focused on assessing the transformative potential of e-learning products by gathering insights from stakeholders in the education sector. It encompassed undergraduate students, faculty members, and e-learning platform employees in Hyderabad, India. The sample size comprised 395 students, 70 faculty members, and 50 employees, selected through purposive sampling to ensure representation from an estimated total population of approximately 10,000 students, 500 faculty members, and 200 e-learning employees. The study examined variables including students' perceptions and needs, faculty perspectives, and institutional readiness for e-learning adoption. Data were collected using online questionnaires based on a Likert scale, ensuring both primary and secondary data sources were utilized. Statistical analyses, including SEM, t-tests, ANOVA, and regression analysis in SPSS-26, were employed with a confidence level of 95 % and a significance level of 0,05. Ethical considerations included obtaining informed consent, maintaining respondent confidentiality, and applying exclusion criteria to ensure data reliability and validity.

Research objectives

To determine the student perception towards e-learning effectiveness.

To study the faculty's attitude toward the effectiveness of online education.

To examine e-learning readiness towards e learning platforms management perspective.

Hypotheses

There is no significant effect of students' perception towards e-learning effectiveness.

There is no association between faculty's attitude toward the effectiveness of online education.

There is no significant effect of factors on e-learning readiness towards e learning platforms management perspective.

RESULTS AND DISCUSSIONS

The analysis was divided into three parts: the first part includes analysis related to student perception, the second part focuses on faculty attitudes, and the third part assesses management readiness towards e-learning.

Student perception towards e-learning effectiveness

The sample size for students is 395.

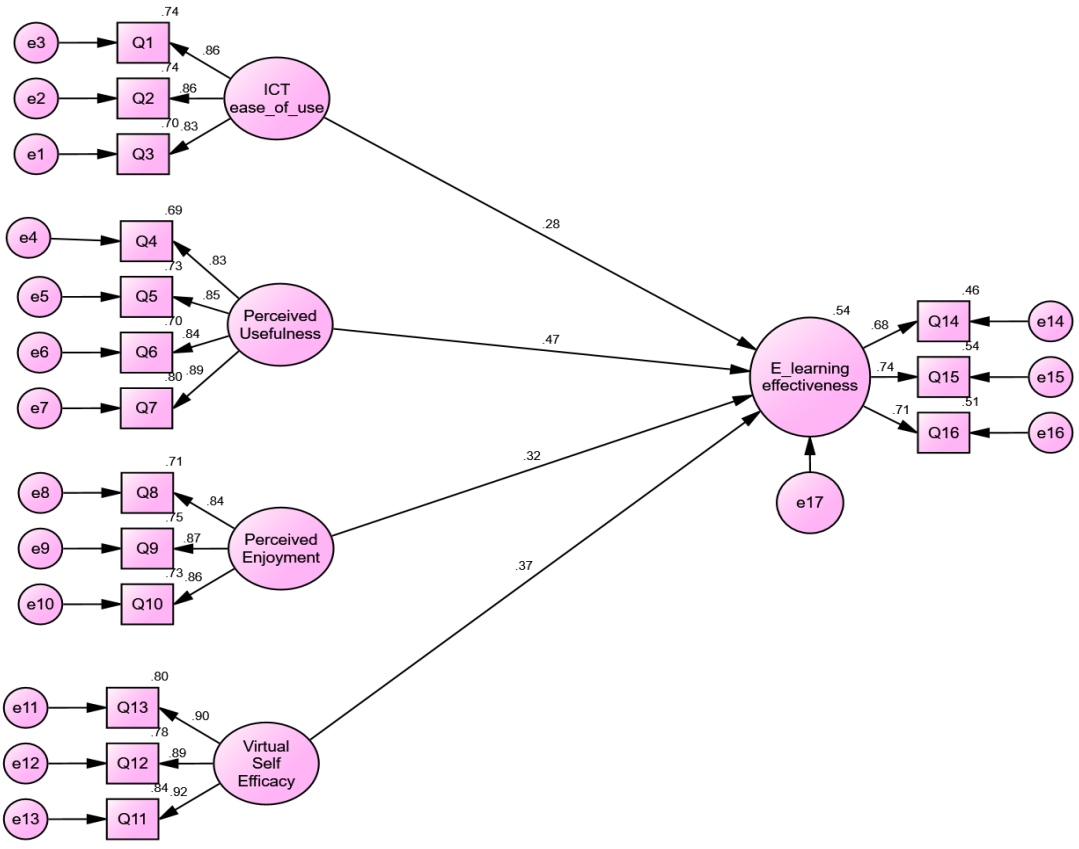

Figure 1. SEM Model

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Table 1. Regression coefficients – Regression Weights

Path	Estímate	S.E.	C.R.	P
Information communication technology (ease of use) -> E-learning effectiveness	0,279	,031	5,350	0,000
Perceived Usefulness -> E-learning effectiveness	0,470	,037	8,394	0,000
Perceived Enjoyment -> E-learning effectiveness	0,321	,033	6,072	0,000
Virtual Self-Efficacy -> E-learning effectiveness	0,370	,035	7,027	0,000

The path analysis results highlight the relationships between various independent variables and their impact on E-learning effectiveness.

Information communication technology (ease of use) positively affects E-learning effectiveness (path coefficient = 0,279, C.R. = 5,350, p = 0,000), indicating that increased ease of use enhances E-learning effectiveness.

Perceived Usefulness has a strong positive influence on E-learning effectiveness (path coefficient = 0,470, C.R. = 8,394, p = 0,000), showing that when learners find E-learning useful, its effectiveness significantly improves.

Perceived Enjoyment also positively impacts E-learning effectiveness (path coefficient = 0,321, C.R. = 6,072, p = 0,000), suggesting that enjoyable E-learning experiences contribute to its effectiveness.

Virtual Self-Efficacy is positively linked to E-learning effectiveness (path coefficient = 0,370, C.R. = 7,027, p = 0,000), indicating that higher virtual self-efficacy enhances E-learning effectiveness.

All these factors—ease of use of ICT, perceived usefulness, perceived enjoyment, and virtual self-efficacy—have significant positive relationships with E-learning effectiveness. Enhancing these elements can lead to a more effective E-learning experience, crucial for digital educational and training programs.

Faculty's attitude toward the effectiveness of online education

The sample size for faculty is 70.

Table 2. The Faculty's attitude toward the effectiveness of online education

Q.no	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
FQ1	It is conceivable that theoretical and practical sessions could be conducted in a manner that lacks genuine contact between instructors and their pupils.	1	6	8	34	21
FQ2	Online lectures provide students with the opportunity to articulate their inquiries with clarity.	2	3	8	24	33
FQ3	Research studies have indicated that students who engage in online learning courses tend to exhibit superior academic performance compared to their counterparts who participate in traditional face-to-face learning environments.	1	7	8	34	20
FQ4	The level of students' engagement in online courses serves as an indicator of their understanding and academic achievement.	21	13	10	17	9
FQ5	The instructor employs strategies to stimulate student motivation towards completing their projects, while also offering constructive criticism on their submitted work.	15	11	13	10	21
FQ6	Online classrooms facilitate educators in attaining the desired learning outcomes as outlined in the syllabi of their respective courses.	3	8	10	27	21

The data summarizes responses to statements (FQ1 to FQ6) about online learning, revealing diverse perceptions and experiences. Many respondents doubt the feasibility of conducting theoretical and practical sessions without in-person contact (FQ1) and the clarity of student inquiries during online lectures (FQ2). There is also skepticism about research suggesting online learners outperform traditional ones (FQ3). While FQ4 data is missing, responses indicate that many see student engagement in online courses as a valid measure of understanding and achievement. For FQ5, a significant number believe instructors motivate students to complete projects and provide constructive feedback. FQ6 shows mixed views on the effectiveness of online classrooms in helping educators achieve learning outcomes. Overall, the responses highlight the varied opinions on online education and the need for ongoing improvements in this evolving field.

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Table 3. One sample T-test

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
FQ1	70	3,83	1,021	,122
FQ2	70	3,73	1,062	,127
FQ3	70	3,74	1,017	,122
FQ4	70	3,94	1,178	,141
FQ5	70	4,03	1,274	,152
FQ6	70	3,77	1,144	,137

The one-sample statistics for six variables (FQ1 to FQ6) from a sample of 70 observations reveal key insights.

Mean, FQ5 has the highest mean score (4,03), indicating the highest average rating, while FQ2 has the lowest mean (3,73).

Standard Deviation, FQ5 shows the highest variability (1,274), indicating more diverse responses. FQ1 has the lowest variability (1,021), suggesting more consistent responses.

Standard Error Mean, FQ5 has the highest standard error (0,152), indicating less precision in estimating the population mean due to higher variability. FQ1 and FQ3 have the lowest standard errors (0,122), indicating greater precision in estimating their population means.

Table 4. T-test analysis

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95 % Confidence Interval of the Difference	
					Lower	Upper
FQ1	6,789	69	,000	,829	,59	1,07
FQ2	5,739	69	,000	,729	,48	,98
FQ3	6,111	69	,000	,743	,50	,99
FQ4	6,696	69	,000	,943	,66	1,22
FQ5	6,756	69	,000	1,029	,72	1,33
FQ6	5,641	69	,000	,771	,50	1,04

Tables 4 and 5 show that the mean score for all items exceeds 3, indicating strong agreement among faculty members. A one-sample t-test, using 3 as the test value, confirms that all e-learning effectiveness mean values are significant ($p < 0,05$), demonstrating higher faculty agreement on e-learning.

E-learning readiness towards e learning platforms, management perspective.

The study used e-learning readiness as the dependent variable and IT infrastructure, equipment capabilities, content, and learning management systems as independent variables from a management perspective. Multiple regression analysis tested the impact of these predictor variables on e-learning readiness.

Table 5. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12,505	5	2,501	5,942	,000
	Residual	18,521	44	,421		
	Total	31,026	49			

The low p-value (Sig. = ,000) in the Regression section indicates that the independent variables collectively have a significant effect on the dependent variable, likely E-learning readiness. This suggests that the model effectively explains variance in the data. However, interpreting the model fully requires additional context on the variables, objectives, and practical implications.

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Table 6. Multiple regression coefficients

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	-,547	,300		-1,822	,070
	IT infrastructure	,248	,094	,183	2,655	,009
	Content	,229	,078	,198	2,947	,004
	Equipment capability	,245	,088	,228	2,793	,006
	Learning management system	,225	,081	,217	2,777	,006
a. Dependent Variable: E-learning readiness						

The coefficient table shows relationships between independent variables and the dependent variable, E-learning readiness, in a regression model. The intercept, though not significant, indicates an estimated E-learning readiness of approximately -0,547 when all independent variables are zero. IT infrastructure, Content, Equipment capability, and Learning management system display positive and significant relationships with E-learning readiness. Each unit increase in these variables is associated with respective increases in E-learning readiness: 0,248 for IT infrastructure, 0,229 for Content, 0,245 for Equipment capability, and 0,225 for Learning management system. These findings highlight the crucial role of these factors in enhancing E-learning readiness.

Table 7. Model summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	,635[a]	,403	,335	,64879

The R Square value of 0,403 indicates the model explains a substantial portion of the variation in E-learning readiness. The Adjusted R Square considers model complexity, while the Standard Error of the Estimate reflects typical prediction error. Together, these statistics assess the model's goodness of fit and explanatory power.

CONCLUSIONS

This study illuminates the transformative impact of e-learning by investigating student perceptions, faculty perspectives, and institutional readiness. The research underscores the critical role of e-learning in modern education. Marketers can leverage these insights to develop and promote e-learning products that meet the diverse needs of stakeholders, enhance user experience through user-friendly designs and perceived usefulness, and support educational institutions in fostering engagement and resilience. This strategic approach not only addresses current educational demands but also positions e-learning as a cornerstone for future-ready educational systems worldwide.

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CONFLICT OF INTEREST

None.

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Methodology: Sri Tulasi.
Drafting - original draft: Sri Tulasi T.
Writing - proofreading and editing: Sri Tulasi T, Inayath Ahamed S B.