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Transformative e-Learning in Indian Higher Education: Empowering Education for the New Normal – A SEM Analysis

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BSTRACT

Purpose: The paper will underscore the escalating significance of e-learning technology in education, particularly as it swiftly becomes the predominant paradigm in higher education. This research aims to investigate the evolving attitudes of students towards e-learning platforms.

Design/Methodology/Approach: The authors investigate the blend of e-learning and Information and Communication Technology (ICT) within Higher Education Institutions (HEIs) throughout India. Their research focuses on the impact of internet-based tools and information on the online learning journey, evaluating student satisfaction with the effectiveness of advanced teaching methods in enhancing knowledge.

Findings: The study reveals that most students exhibit a favorable stance towards e-learning, with gender and frequency of online learning playing pivotal roles in shaping their perception. Moreover, the attitude towards e-learning usage significantly influences this positive outlook.

Research Limitations: The study's generalizability is limited due to its sample size of 200 learners from Tamil Nadu, potential bias, and time constraints, and may not account for broader student demographics, technology access, digital literacy, and external factors.

Managerial Application: HEIs should integrate e-learning technologies into their strategic plans, investing in infrastructure, training faculty, and revising curricula.

Originality/Value: The study assesses technological strategies in Indian Higher Education Institutions for learning well-being and development, discusses ICT innovation, and proposes a classroom teaching pedagogy evaluation framework.

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Introduction

The education landscape in India is transforming due to global challenges. Traditional paradigms are being replaced by e-learning, particularly in Higher Education Institutions (HEIs). This discourse explores the synergies between technology and pedagogy, creating a dynamic educational ecosystem that transcends physical boundaries. The aim is to empower education in India and create a future where learning knows no bounds. E-learning is a rapidly growing technology in education, with a majority of students having a moderate to highly favorable attitude toward it. Post-COVID-19, the social life changed, leading to the adoption of modern learning methods among scholars. In 2016, India's online learning industry reached a value of USD 247 million, boasting 1.6 million users. Projections indicate an exponential growth of 8X to USD 1.96 billion by 2021, with the user base expected to surge at a 44% Compound Annual Growth Rate (CAGR) to 9.6 million users. Despite being the world's second-largest e-learning market after the United States, which is anticipated to reach $48 billion and 730 million internet users by 2020, India's online education sector has not received substantial government attention. The 2021 budget allocation for the education sector was Rs. 93,224.31 crore, representing a decrease of Rs 6,086.89 crore from the previous year. Although the COVID-19 pandemic exacerbated the digital divide, the budget lacked provisions for implementing the National Education Policy (NEP) or advancing educational technology. While the government reduced the GST rate for online education services from 18 percent, students continued to study online from home without receiving reimbursements. The health sector took center stage during COVID-19, and for blended learning to thrive, state governments must make consistent financial investments over time. This study will measure the present conditions of online education and its perception in the years between 2023 and 2024 for the new normal approach by collecting opinions from the students involved in this study to know the present conditions prevailing in the learning conditions.

Review of Literature

Digital transformation plays a crucial role in modern education, encompassing various dimensions. According to Bozhko et al., (2016), digital platforms and resources must align with contemporary educational standards and guidelines. They emphasize that while technical tools are paramount, broader changes at academic, institutional, and programmatic levels are equally crucial in reshaping digital education. Integrating digital tools in education introduces new responsibilities for both educators and learners, creating adaptable and interactive learning environments. This shift encourages greater autonomy among students and promotes collaborative teamwork Elena, (2011). Furthermore, digital literacy and skills are of utmost importance. As we move towards a more interconnected world, there is a growing need for individuals proficient in both technology and interpersonal communication Azarenko et al., (2018).From the perspective of university educators, Bond et al., (2018) suggest that technical and instructional guidance is essential. Administratively, many higher education institutions have taken advantage of technology to enhance learning flexibility for students. They have also implemented just-in-time mentoring to ensure the availability of high-quality education. Additionally, these institutions are streamlining their internal processes to optimize teaching delivery. Regarding infrastructure, digital technology offers a myriad of avenues to support education. Learning portals and digital services have become indispensable tools that align with contemporary educational practices and meet current requirements Bresinsky & von Reusner,(2018). These platforms not only facilitate learning but also enhance the overall educational experience for both educators and students alike. Online learning, as defined by Zhao et al., 2018), refers to the delivery of instructional methods through real-time online broadcasts. In this form of learning, instructors are required to upload their teaching materials beforehand, conduct lectures, and seminars, address student queries, and facilitate class discussions. Both instructors and students are active participants in the online teaching process, adapting to various educational strategies, levels of engagement, and technological challenges. Institutions' IT departments play a significant role in providing the necessary online educational resources, networks, and technologies to facilitate real-time teaching. However, assessing the preparedness of students for live online sessions is a challenging task for educators, as students access lessons from diverse locations. Ensuring students' readiness for live digital learning is paramount for a productive learning environment and academic success, according to Dangol & Shrestha, (2019). Unlike traditional classroom settings, participation in remote learning isn't always guaranteed, making

it challenging to measure students' focus (Cheon et al., 2012). The effectiveness of live online learning largely depends on students' preparedness, emphasizing the need to identify key factors influencing their readiness. Research indicates that students' readiness for online courses is influenced by their ability to engage independently, apply knowledge confidently, and understand delivery methods. Several factors determine learners' readiness for online education. Walia, (2019) examined this readiness based on students' learning approaches and gender differences. The study employed seven criteria: technical competence, living situation, instructional presence, perceived effectiveness, relationship satisfaction, capabilities, and diverse learning needs. Engin, (2017) focused on students' emotional and intellectual readiness for online learning, particularly their computer self-efficacy. Hung et al., (2010) developed a similar method to assess teens' readiness based on student numbers. Various studies have scrutinized the tools, criteria, and standards used to evaluate students' digital readiness Farid, (2014), suggesting that attitudes, identities, aspirations, internet self-efficacy, and digital literacy significantly influence multimodal e-learning preparedness. Despite the growing popularity of online learning, research specifically focusing on real-time online education remains limited and others have explored live-streaming educational systems and digital teaching approaches Rommel J Miranda, (2015). However, the readiness of higher education students for live online courses, particularly at the undergraduate and doctoral levels, requires further investigation. By integrating five key factors: technology enthusiasm Phan & Dang, (2017), progressive public persona, achieving excellence, learning curiosity, and digital communication identity, educators can better assess students' readiness and enthusiasm for real-time online learning. The importance of digital learning and online education in disseminating innovative concepts and new information is increasingly recognized Bayuo et al., (2020). Discussions in the literature highlight leveraging technology to offer affordable education and training to vulnerable populations. Distance learning and lifelong learning play vital roles in delivering quality education to remote areas through innovative technologies and software de Pretelt & Hoyos, (2015). Jean Kiekel, (2016) pointed out that the majority of students will likely enroll in at least one online course before finishing high school. These online programs offer students unique educational opportunities that may not be accessi-ble otherwise due to reasons such as a lack of interest in specific subjects, budget constraints at schools, or limited teacher expertise. In a comprehensive analysis by Means et al., (2010) of the vast array of empirical studies conducted on e-learning between 1996 and 2008, findings consis-tently indicated that students participating in online learning generally outperformed their counterparts receiving traditional face-to-face instruction. The potential of education to be truly transformative lies in creating nurturing learning environments that cultivate students' analytical, imaginative, inventive, critical thinking, and metacognitive skills. Online teaching has been embraced globally in various forms and is witnessing rapid growth. Parker et al., (2011) reported that during the 2010-11 academic year, 89% of colleges offered fully online, hybrid, or other remote education courses. Furthermore, Allen & Seaman, (2013) noted that by 2013, 32% of postgraduate students had enrolled in at least one online course. The Community of Inquiry (CoI) framework, developed by Garrison et al., (1999), Highlights the significance of a harmonious interplay between three key elements for successful online learning: cognitive presence, teaching presence, and social presence. This framework underscores the importance of cultivating interactive online environments that encourage active engagement, proficient teaching, and meaningful social connections among students.

Conceptual Framework

Figure 1 illustrates that Online learning is influenced by three factors: the learner's perception, teacher participation, and the institution's role. Learner's perception involves transformative learning and reflective thinking, while teacher participation involves creating engaging content and providing feedback. The institution's role involves providing support, training, and quality materials. The importance of each factor varies depending on the program.

Research Hypotheses

- H1: Learner's perception has a positive influence on Transformative learning
- H2: Teacher's Participation has a positive influence on Transformative learning
- H3: Institution's role has a positive influence on Transformative learning
- H4: Transformative learning has a positive influence on Reflective thinking

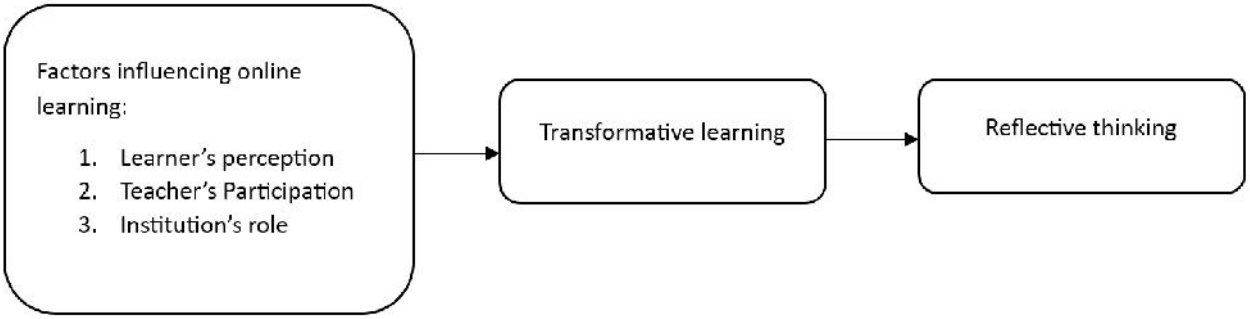

Figure 1

Source: *Author's ideation from the Literature Review 2023, 2024*

Methodology

The study empirically examines the integration of e-learning with Information and Communication Technology (ICT) in Higher Education Institutions (HEIs) across India. It investigates the influence of internet-based applications on online learning experiences and assesses student satisfaction with knowledge enhancement through advanced pedagogies. We gathered data through a structured questionnaire, utilizing a five-point Likert scale for measurement. Participants were recruited through convenience sampling in Karaikudi, Tamil Nadu, South India, using Google Forms. From September to November 2023, 230 questionnaires were distributed, with 200 responses deemed suitable for analysis. The research also investigates student's online learning methodologies and skills development, utilizing both primary and secondary data sources.

Analysis and Interpretation

The study uses various tools and methodologies to analyze gender distribution, technology usage, and psychometric evaluation of Digital Financial Literacy (DFL), discriminant validity, and hypotheses testing. Gender distribution is determined by counting male and female respondents, while frequency distribution and percentages are used to represent the proportion of respondents using each technology. Psychometric evaluation of DFL is assessed using Skewness, kurtosis, factor analysis, Cronbach's Alpha, and Average Variance Extracted (AVE). Discriminant validity is assessed by comparing correlations between factors with the square roots of their AVE. Hypotheses are formulated based on theoretical frameworks or research questions, and statistical tests are used to examine the significance of relationships between these factors and DFL.

Table 1: Gender Wise Respondents

Gender	Frequency	Percentage (%)
Male	96	48.0
Female	104	52.0
Total	**200**	**100.0**

Source: *Primary Data*

Table 1 shows that out of 200 respondents, 96 of them (48.0%) are male; and 104 of them (52.0%) are female.

Table 2: Usage of Technologies for Education Purposes

Usage of technologies for education purposes	Frequency	Percentage (%)
Tablet	28	14.0
Laptop	48	24.0
PC	59	29.5
Mobile	65	32.5
Total	200	100.0

Source: *Primary Data*

Table 2 shows the usage of technology for education purposes. Out of 200, 32.5 % of the respondents are using mobile for education purposes, followed by 29.5 are using the PC, 24.0 of the respondents are using the laptop for education purposes, and

14.0% of the respondents are using the tablet for education purposes.

Table 3 explains the psychometric evaluation of Digital Financial Literacy (DFL) involves analyzing Skewness, kurtosis, factor loadings, Cronbach's Alpha, and Average Variance Extracted (AVE) for each factor. Skewness and kurtosis

Table 3: Digital Financial Literacy: Psychometric Evaluation

Digital Financial Literacy		**Skewness**	**Kurtosis**	**Factor Loadings**	**Cronbach's Alpha**	**AVE**
Digital Financial Literacy						
Learner's Perception	LP5	0.816	0.584	0.797	0.891	0.623
	LP4	0.835	0.689	0.662		
	LP3	0.876	0.590	0.850		
	LP2	0.823	0.634	0.886		
	LP1	0.891	0.623	0.729		
Teacher's Participation	TP5	0.838	0.599	0.721	0.838	0.599
	TP4	0.827	0.512	0.681		
	TP3	0.817	0.643	0.794		
	TP2	0.816	0.584	0.870		
	TP1	0.876	0.590	0.787		
Institution's Role	IR6	0.823	0.634	0.777	0.827	0.512
	IR5	0.891	0.623	0.780		
	IR4	0.863	0.419	0.618		
	IR3	1.289	0.595	0.774		
	IR2	0.838	0.599	0.852		
	IR1	-1.89	0.546	0.788		
Transformative learning						
	TL1	0.816	0.584	0.720	0.816	0.584
	TL2	0.823	0.634	0.736		
	TL3	0.891	0.623	0.796		
	TL4	0.838	0.599	0.872		
	TL5	0.827	0.512	0.842		
Reflective thinking						
	RT1	-0.789	0.619	.898	0.845	0.591
	RT2	0.724	0.648	0.833		
	RT3	0.724	0.658	0.660		
	RT4	0.654	0.631	0.594		
	RT5	0.789	0.639	0.221		
	RT6	0.975	0.627	0.688		

measure the distribution of responses, while factor loadings represent the correlation between items and factors. Cronbach's Alpha measures internal consistency reliability, and AVE measures variance captured by items in each factor relative to total variance. The data for Learner's Perception (LP) shows close to zero Skewness and kurtosis values, indicating normal distributions. Factor loadings ranged from 0.729 to 0.891, indicating strong associations between items and the factor. Cronbach's Alpha values are generally high, indicating good internal consistency and reliability. These findings support the validity and reliability of the measurement instrument used for assessing Digital Financial Literacy.

Table 4 presents mean, standard deviation, and inter-factor correlations for factors related to digital financial literacy. The data indicates that on average, respondents perceive their digital financial literacy at a moderate level. Teacher participation is moderate, with a higher standard deviation suggesting more variability. Institutions play a stronger role in promoting digital financial literacy, with a higher mean score. Transformative learning experiences are moderate, with a mean score of 3.818. Reflective thinking is lower, with a mean score of 2.843. Positive correlations between factors suggest they tend to co-occur or influence each other positively. These insights can inform targeted interventions and educational programs aimed at enhancing digital financial literacy among diverse populations.

Table 5 presents estimates, standard errors, critical ratios, p-values, and significance indicators for hypotheses related to the influence of factors on Transformative Learning (TL) and Reflective Thinking (RT) in the context of Digital Financial Literacy. The data indicates significant positive relationships between Learner's Perception (LP), Teacher's Participation (TP), Institution's Role (IR), and Transformative Learning (RT). The high C.R. and significance indicator (***) support the positive influence of Learner's Perception on Transformative Learning. The high C.R. and significance indicator (***) also suggest a positive influence on Teacher's Participation in Transformative Learning. The high C.R. and significance indicator (***) also support the positive influence of the Institution's Role in Transformative Learning. The findings highlight the importance of these factors in fostering transformative learning experiences and reflective thinking related to digital financial literacy.

Table 4: Discriminant validity

	Mean	S. D	Learner's Perception	Teacher's Participation	Institution's Role	Transformative learning	Reflective thinking
Learner's Perception	3.915	1.425	**0.768**				
Teacher's Participation	3.914	1.657	0.519***	**0.796**			
Institution's Role	4.961	1.918	0.379***	0.395***	**0.789**		
Transformative learning	3.818	1.239	0.531***	0.486***	0.324***	**0.774**	
Reflective thinking	2.843	1.265	0.319***	0.256***	0.135*	0.495***	**0.716**

Table 5: Hypotheses Result

	Estimate	S.E.	C.R.	P	Label	Significant	Accepted/ Rejected
TL	<—	LP	0.183	0.055	3.301	***	Accepted
TL	<—	TP	0.224	0.056	3.974	***	Accepted
TL	<—	IR	0.341	0.073	4.669	***	Accepted
RT	<—	TL	0.595	0.086	6.954	***	Accepted

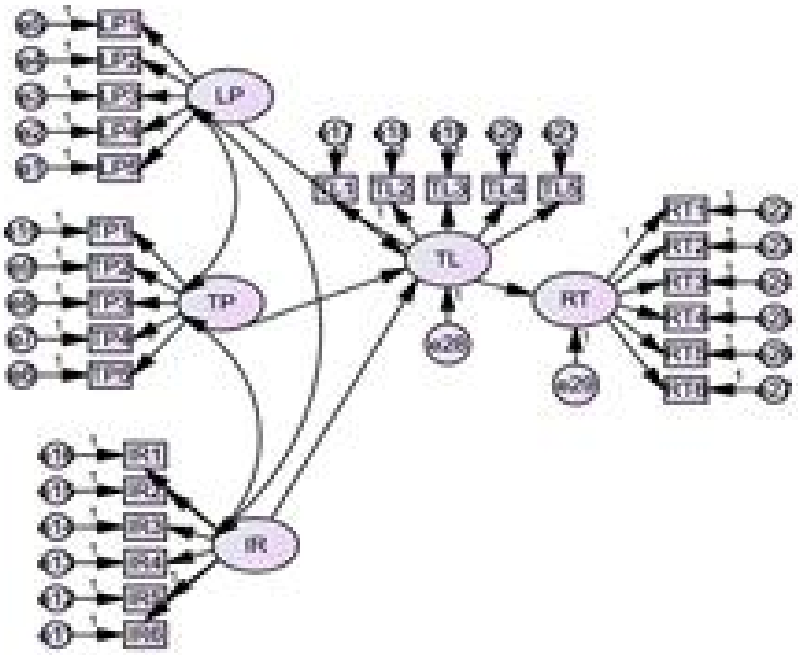

Figure 2 Sem Analysis from the calculated values

LP = Learner's perception, TP = Teacher's Participation, IR = Institution's role, TL = Transformative Learning, RT = Reflective Thinking

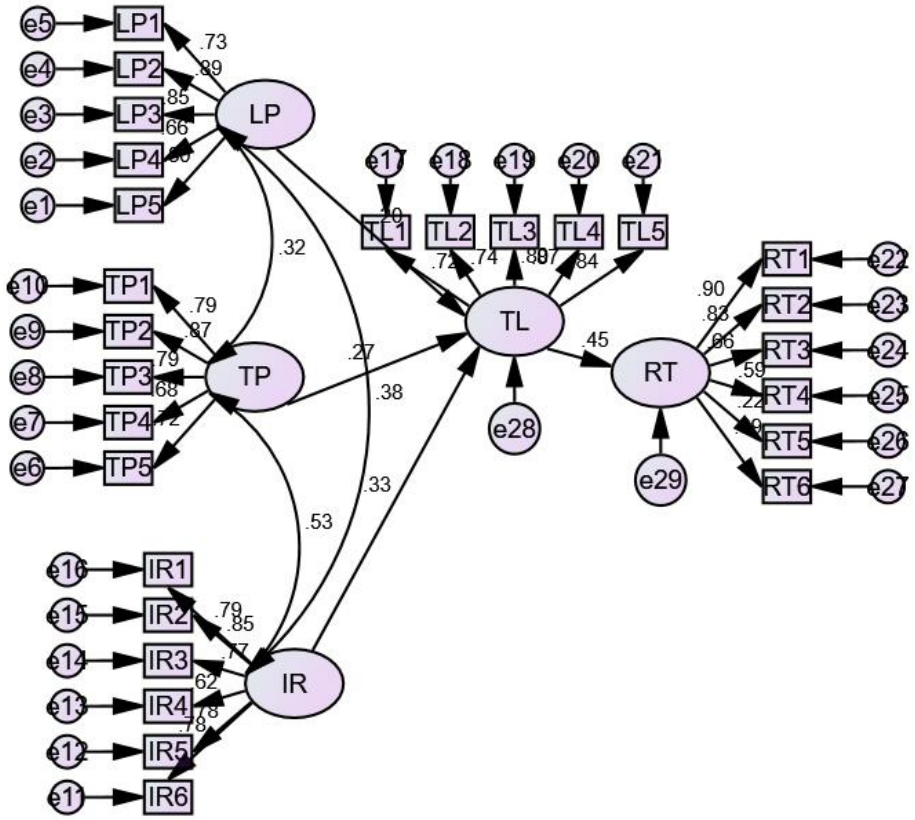

Figure 3

Figure 2 explains that online learning is influenced by three main factors: learner characteristics, instructor characteristics, and course design. Learner characteristics include motivation, self-discipline, time management, and technological fluency. Instructor characteristics include experience, content creation, and communication skills. Course design factors influence each other.

Figure 3 examines factors influencing Digital Financial Literacy (DFL) and assesses the instrument's reliability and validity. It includes factors like Learner's Perception, Teacher's Participation, Institution's Role, Transformative Learning, and Reflective Thinking. The table also uses statistical measures like Skewness and Kurtosis to describe the data distribution. Factor loadings represent the correlation between questions and factors, while Cronbach's Alpha measures internal consistency. The table provides information for interpreting the DFL measurement instrument but does not offer direct insights into the factors themselves.

Conclusion

The study highlights the growing importance of e-learning in India's higher education sector, especially during the pandemic. It reveals a shift in students' attitudes towards e-learning, with a majority showing a moderate to highly favorable stance. Key determinants of students' engagement with e-learning platforms include gender, frequency of online learning, and attitudes towards usage. However, the study's limitations include its sample size, potential biases, and regional focus. It suggests integrating e-learning technologies into strategic plans, investing in infrastructure, faculty training, and curriculum revision. The research also provides insights into innovative pedagogical approaches and a framework for evaluating classroom teaching methods.

Scope for Future Research

Virtual learning combined with AI and ML has the potential to completely transform the educational system. With the integration of LMS (Learning Management Systems), virtual teaching on learning platforms is now made possible for e-learning. A learning gap can be closed by using AI-based solutions to develop individualized learning materials that allow students to progress at their own pace and in a flexible way. Virtual assistants are available to students, who can use them to master difficult material while supporting their teachers. Content analytics is applied in a data-driven manner to assess student progress. Teachers can review student performance based on the results and personalize their teaching methods. As technology keeps changing, new methods of customizing content, user-centric learning platforms, and teaching methodologies will emerge in the teaching-learning sphere to deliver fast-track education via e-learning.

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