



Perception Influencing Motivation Towards the Adoption of Online Learning in the Indian Context: An Empirical Investigation Using the Technology Acceptance Model

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Abstract. This study explores the relationship between student perception and motivation regarding online learning in India, particularly in the wake of the COVID-19 pandemic, which necessitated a rapid shift to digital education. Drawing on the Technology Acceptance Model (TAM) and the Perception of Online Teaching and Learning (POSTOL) framework, the research employs a quantitative methodology, utilizing PLS-SEM to analyze data from 274 respondents, including students in traditional educational institutions and corporate training programs. The findings reveal a significant positive association between favorable perceptions of online learning and increased motivation to adopt online educational methods. This research contributes valuable insights for educational institutions and ed-tech companies seeking to enhance the effectiveness of online learning environments in India. The study emphasizes the importance of fostering positive perceptions and intrinsic motivation to ensure successful engagement with online learning platforms.

Keywords: Covid-19; Education; Motivation; Online Learning; Technology

1 Introduction

The rapid advancement of technology has significantly transformed various industries, particularly the educational sector. The swift adaptation of technological tools necessitates a strong foundation of motivation among learners. Research indicates that motivation profoundly influences individual learning capabilities [1]. This study aims to explore the intricate relationship between students' perceptions of online learning and their motivation to engage with online learning platforms, particularly in the context of the COVID-19 pandemic.

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During the COVID-19 pandemic, traditional teaching methods were drastically altered, leading to a widespread adoption of technology-driven educational approaches. Various online learning technologies were rapidly developed to ensure the continuity of quality education. Previous studies have established the effectiveness of online learning platforms in fields such as medicine [2], while gaining traction in corporate training. As such, it becomes imperative for students, educators, and professionals to continuously enhance their knowledge and skills related to online learning.

The primary objective of this paper is to unravel the complex factors influencing motivation and to examine how learners' perceptions of online education affect their motivation to engage with these platforms. To achieve this, the study leverages the Perception of Students Towards Online Learning (POSTOL) framework alongside constructs from the Technology Acceptance Model (TAM).

2 Literature Review

This study employs the established POSTOL scale and motivation constructs based on the Technology Acceptance Model (TAM), adapted from the Theory of Reasoned Action (TRA). The research aims to evaluate the relevance of these constructs within the Indian context, providing insights into their application in online learning.

2.1 Perception of Students Towards Online Learning (POSTOL) and Related Constructs

The POSTOL scale, developed by [3], is rooted in research conducted on 208 Taiwanese students. It assesses the acceptability of web-based learning tools through four major components: instructor characteristics, instructional design, trust, and social presence. This scale is contemporary, comprehensive, and robust, demonstrating a significant relationship between students' perceptions of online learning resources and their personality traits, demographics, and cultural backgrounds [3, 4].

2.2 Instructor Characteristics

Numerous studies emphasize the importance of instructor characteristics, highlighting that an instructor's compassion, support, and adaptability significantly impact student engagement [5]. Interactive sessions that encourage student feedback further enhance the effectiveness of online learning [6]. Research has shown that instructor immediacy in synchronous courses correlates positively with students' eagerness to learn and overall satisfaction [7,8,9].

2.3 Instructional Design

Instructional design is crucial in evaluating the adaptability of web-based learning environments. Continuous feedback from learners can improve the quality of online courses [10]. It is essential to ensure that course content does not overload students'

working memory [11]. The design should be proactive and engaging, as highlighted by [12] in their comparison of blended and flipped learning.

2.4 Social Presence

Social presence refers to the sense of belonging within a learning community in online environments. Increased group interaction enhances student retention and satisfaction [13,14]. A strong social presence fosters connections among students, encourages constructive engagement, and addresses issues that may not be covered by instructors [15].

2.5 Trust

Trust is a critical factor influencing students' decisions to engage with online learning [16] identified trust as essential for students to participate actively in courses, particularly for those with disabilities who may be hesitant to share sensitive information. Factors influencing trust include the reliability of the platform and the authenticity of course content [17].

2.6 Motivation and Online Learning

Motivation is a multifaceted construct playing a vital role in learning. Brophy [1] defines motivation as the theoretical framework for understanding the initiation, direction, intensity, persistence, and quality of goal-directed behavior. Motivation can be intrinsic, derived from internal satisfaction, or extrinsic, linked to external rewards.

The literature reveals a strong connection between intrinsic motivation and student engagement in online learning [18,19]. This study captures extrinsic motivation through perceived usefulness and ease of use while examining intrinsic motivation via perceived enjoyment. Constructs are measured using scales adapted from [20].

2.7 Perceived Usefulness

Perceived usefulness reflects the value derived from engaging in online learning activities and influences attitudes towards technology adoption [20]. Studies have demonstrated a significant relationship between perceived usefulness and satisfaction, as seen in [21,22].

2.8 Ease of Use

Ease of use denotes the expected effort required to engage with a particular medium [23]. Studies in various sectors, including banking [24] and technology adoption [25], emphasize the significance of perceived ease of use in facilitating user engagement.

2.9 Perceived Enjoyment

Perceived enjoyment refers to the inherent pleasure derived from learning activities, independent of external rewards [14]. This study explores the relationship between perceived enjoyment and online learning perceptions, contributing to the understanding of intrinsic motivation in educational contexts [26].

The original TAM developed by [20] has laid the groundwork for a substantial body of research on technology acceptance. It effectively identifies two primary constructs perceived ease of use and perceived usefulness which have been consistently validated across various contexts and technologies. Utilizing the original constructs allows this study to build upon established theoretical foundations, ensuring that the findings are grounded in a robust and widely recognized framework.

2.10 Relevance to Online Learning Context:

While more recent revisions of TAM (such as TAM2 and UTAUT) introduce additional constructs (e.g., social influence, facilitating conditions), the core constructs of perceived ease of use and perceived usefulness remain particularly relevant for understanding online learning environments. In educational contexts, where students' perceptions of ease and usefulness significantly affect their motivation to engage with online platforms, the original TAM constructs serve as a direct link to understanding students' attitudes towards online learning.

Simplicity and Clarity: The simplicity of the original TAM allows for clear operationalization of constructs, making it easier to measure their impact on motivation. By focusing on a smaller set of constructs, the study can maintain clarity and precision in the analysis, which is particularly important in an exploratory context like the online learning landscape during the COVID-19 pandemic. This clarity helps prevent confusion that might arise from incorporating numerous additional constructs that more complex models might introduce.

Support from Existing Literature: A substantial body of literature supports the validity of TAM constructs in various technological settings, including online learning. For instance, studies have consistently shown that perceived ease of use and perceived usefulness directly influence students' intentions to adopt online learning tools [27,28]. By using the original constructs, this study aligns with previous findings, providing a consistent framework for comparison.

Flexibility for Future Research: The original TAM constructs provide a foundation upon which more complex models can be built in future research. By establishing a strong base with the original TAM, this study opens the door for subsequent explorations that may incorporate additional factors, such as social influence or institutional support, thereby extending the research scope.

Cultural Considerations: In the Indian context, where online learning is still relatively new and not as widely accepted, the original constructs of TAM resonate well with the

current educational challenges. The focus on perceived ease of use and perceived usefulness directly addresses the barriers faced by students, such as technology access and usability, making them particularly pertinent in this study.

In conclusion, the existing body of literature underscores the critical interplay between perception and motivation in the context of online learning. The Technology Acceptance Model (TAM) has emerged as a foundational framework for understanding how perceptions of ease of use and usefulness influence learners' motivation to engage with online educational platforms. While contemporary revisions to TAM offer valuable insights, the original constructs remain highly relevant and applicable, particularly in emerging contexts like online learning in India, where challenges such as technology access and usability persist. Additionally, factors such as instructor characteristics, social presence, and trust have been identified as significant contributors to learners' motivations. This literature review highlights a notable gap in understanding the intricate dynamics of how these factors interact to shape motivation in the rapidly evolving landscape of online education, particularly in the wake of the COVID-19 pandemic. Future research should aim to explore these relationships further, incorporating a more comprehensive range of variables to develop a holistic understanding of student engagement and success in online learning environments. By addressing these gaps, we can form educational strategies that foster a more effective and engaging online learning experience for students.

3. Methodology

This study was conducted in the Indian subcontinent, focusing on respondents who were students enrolled in traditional educational institutions (schools and colleges) as well as those participating in corporate training to enhance their skills while on the job. Data collection was carried out using a questionnaire distributed through a snowball sampling technique, resulting in a total of 274 responses that were subsequently analyzed. The data collection period spanned from March 2020 to May 2022, coinciding with the critical phase of the COVID-19 pandemic when a strict nationwide lockdown was enforced as recommended by the World Health Organization.

A structured, non-disguised questionnaire was developed, utilizing established scales from the Perception of Students Towards Online Learning (POSTOL) framework and motivation scales adapted from the Technology Acceptance Model (TAM). The questionnaire comprised three sections:

Section A: Demographic profile of the respondents.

Section B: Elicited responses regarding perceptions towards online learning.

Section C: Captured motivational perspectives related to online learning.

The use of snowball sampling, while typically employed for sensitive topics or hard-to-reach populations, was justified due to the initial challenges in recruiting participants during the pandemic, enabling broader access to diverse respondents.

Table 1. Indicator variables and their statements

Statement	Label
Construct: Instructor Characteristics	
Instructors should be friendly and approachable.	IC1
Instructors should encourage student interactions.	IC2
Instructors should provide sufficient learning resources online.	IC3
Instructors should solve emerging problems efficiently	IC4
Instructors should provide fast feedback to queries in the discussion forum.	IC5
Construct: Social Presence	
Online course would help me to use the Internet sources more efficiently.	SP1
I think sharing knowledge through online discussions is a good idea.	SP2
Online discussion enables students to exchange ideas and comments.	SP3
I would benefit from using interactive applications.	SP4
Browsing classmates' works would help to improve the quality of my own work.	SP5
Construct: Instructional Design	
I differentiate between difficult and easier types of course content and study them differently.	ID1
I like to involve myself actively in group discussions.	ID2
Understanding the subject matter of the course is very important to me.	ID3
Construct: Trust	
Online courses should provide a better learning experience than traditional courses.	T1
I believe that I can earn better grade in an online course than in a traditional course.	T2
Students learn more in online courses than they learn in traditional courses	T3
Construct: Perceived usefulness	
Using Internet based Learning medium (ILM) will improve my course grades.	PU1

The advantages of Internet based Learning medium will outweigh the disadvantages.	PU2
Overall, using Internet based Learning medium will be advantageous.	PU3
Construct: Ease of Use	
Instructions for using Internet Learning Medium will be hard to follow	EU1
It will be difficult to learn how to use Internet Learning Medium	EU2
It will be easy to operate Internet Learning Medium	EU3
Construct : Perceived Enjoyment	
I would find using Internet Learning Medium to be enjoyable	PE1
The actual process of using Internet Learning Medium would be pleasant	PE2
I would have fun using Internet Learning Medium	PE3

4. Conceptual Model

The literature discussed in the previous section supports the formulation of a research framework for examining the relationship between motivation towards online learning and perception towards online learning. The statements are shown in table 1. In this context, online learning refers to any medium that involves the use or adoption of online means or technology to aid the learning process.

To assess this relationship, the researchers employed Partial Least Squares Structural Equation Modeling (PLS-SEM), a robust method for multivariate analysis in social sciences. The analysis was conducted in two stages: first, a measurement model (outer model) defining the relationship between the indicators and their manifest variables; and second, a structural model (inner model) explaining the relationships between the latent variables. The repeated indicators approach, or hierarchical components model, as suggested by [29], was utilized.

The Perception of Students towards Online Learning (POSTOL) framework is conceptualized as a second-order construct, measured directly by observed variables for the first-order factors: Instructor Characteristics, Social Presence, Instructional Design, and Trust. Similarly, motivation is observed through Perceived Usefulness, Perceived Enjoyment, and Ease of Use. The proposed conceptual model is depicted in Figure 1.

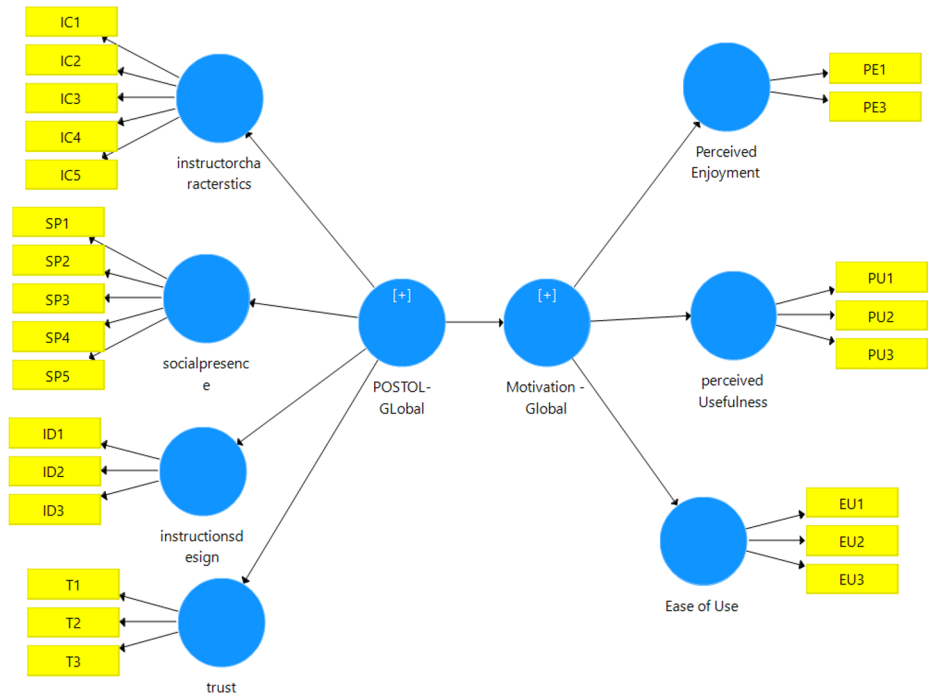


Fig1: Conceptual Model
Source: PLS Output

The choice of a second-order reflective model is based on a comprehensive review of the existing literature and the presence of high correlations (>0.5) between the indicator variables. The PLS approach is non-parametric in nature, requiring no assumptions of data normality, making it robust in cases of small sample sizes. Against this backdrop, we hypothesize the following relationship:
Hypothesis: Perception towards online learning will positively influence motivation to pursue online learning.

5. Analysis

The demographic profile of the respondents showcases a balanced representation across key demographics, including gender, education, and occupation. This balance enhances the reliability of the findings and allows for a more nuanced understanding of how various factors influence motivation and perceptions of online learning. The demographic profile is summarized in Table 2.

Table 2. Demographic Profile of the Respondents

DEMOGRAPHIC VARIABLES		PERCENTAGE
Gender	Male	39.1
	Female	66.6
	Prefer not to say	0.4
Education	High School	10.2
	Undergraduate	63.5
	Post Graduate	23.7
	Doctorate	2.6
Occupation	Student	59.1
	Profession	29.2
	Business	7.3
	Homemaker	4.4

Source: Primary Data

PLS algorithm was run. Bootstrapping was run to test the significance of the results (Wong, 2013). The results showed 50.7% of variation in motivation is explained by perception towards online learning as depicted in Figure 2.

5.1 Assessment of the Reflective Model

As the correlation values as depicted in Table 3 are greater than 0.5 (0.4 accepted by some researchers), it suggested a Reflective model Repeated Indicator approach could be used to determine the higher order reflective constructs labeled as Motivation and POSTOL.

Table .3 Latent Variable Correlation

	Ease of Use	Perceived Enjoyment	Instructions design	Instructor characteristics	Perceived Usefulness	Social presence	Trust
Ease of Use	1	0.459	0.28	0.094	0.519	0.278	0.388
Perceived Enjoyment	0.459	1	0.394	0.313	0.819	0.666	0.674
Instructions design	0.28	0.394	1	0.577	0.428	0.638	0.363

Instructor-characteristics	0.094	0.313	0.577	1	0.282	0.597	0.309
Perceived Usefulness	0.519	0.819	0.428	0.282	1	0.636	0.737
Social presence	0.278	0.666	0.638	0.597	0.636	1	0.582
Trust	0.388	0.674	0.363	0.309	0.737	0.582	1

Source: PLS Output based on primary data

In order to assess the reflective measurement model, four types of test are conducted i.e. Internal Consistency, Reliability, Convergent validity and discriminant validity [30,31]. Before carrying out these tests the data was tested to rule out any collinearity issues for which VIF values are assessed. All VIFs value are less than except for PE 2 (perceived enjoyment) therefore it was dropped for from further analysis as it didn't meet the basic criteria of being less than 5 as recommended by(Ringle ,2015). To measure construct reliability for internal consistency, Cronbach's alpha and CR (Composite Reliability) measures are used. Further, CR is a preferred alternative to Cronbach's alpha in a reflective model therefore a cut off value 0.7 for CR is accepted as indicated in the Table 4.

Table 4. Composite Reliability and Convergent Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Ease of Use	0.609	0.579	0.783	0.547
Perceived Enjoyment	0.922	0.922	0.962	0.928
Perceived Usefulness	0.896	0.896	0.935	0.827
Instructions Design	0.725	0.73	0.844	0.644
Instructor Characteristics	0.863	0.863	0.901	0.646
Social Presence	0.905	0.905	0.929	0.725
Trust	0.868	0.869	0.919	0.792
Motivation **	0.81756141		0.889371	0.732283
POSTOL **	0.80381255		0.960236	0.586756

Source: PLS Output based on Primary data

** For higher order constructs, Cronbach's alpha, CR and AVE values calculated using Excel.

Next, we check for convergent and discriminant validity. To verify the convergent validity, Average Variance extracted (AVE) is used. AVE. As suggested by [32] all AVE values were more than 0.5 which confirmed the convergent validity for the model. To assess discriminant validity Fornell –Larcker criterion was used .As seen from Table 5, all the values are largest among their corresponding rows and column values, and therefore discriminant validity is met as per Fornell-Larcker criterion.

Table 5. Discriminant Validity

	Ease of Use	Perceived Enjoyment	Instructions design	Instructor characteristics	Perceived Usefulness	Social Presence	Trust
Ease of Use	0.739						
Perceived Enjoyment	0.459	0.963					
Instructions design	0.28	0.394	0.803				
Instructor characteristics	0.094	0.313	0.577	0.803			
perceived Usefulness	0.519	0.819	0.428	0.282	0.91		
Social presence	0.278	0.666	0.638	0.597	0.636	0.851	
Trust	0.388	0.674	0.363	0.309	0.737	0.582	0.89

Source: PLS Output based on Primary data

To assess the discriminant validity of the second the second order construct HTMT (Hetrotrait-Monotrait Ratio) criterion was used and calculations were made in Excel. The result showed the value as:

HTMT Ratio 0.77872736

Which is below the conservative threshold of 0.85.

5.2 Significance and relevance of structural model relationships

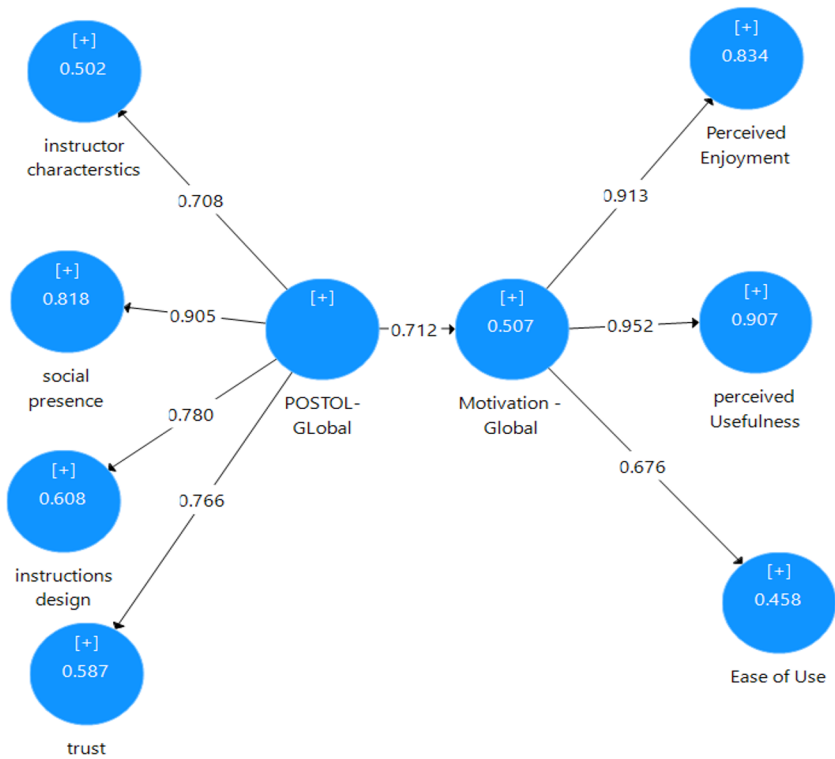


Fig. 2 Final model after PLS Algorithm
Source: PLS Output based on Primary data

The path coefficients generated by PLS algorithm explains the relationship between the constructs of the structural model. In Figure 2, R2 square of endogenous construct is shown inside the circle as 0.507. Path coefficient value closer to +1 indicates a strong positive relationship and a value closer to 0 is suggestive of a weak relationship. Table 6 shows that all the paths are significant as all the p values are less than 0.05.

Table 6. Path coefficient values and their significance

	Original Sample (O)	Sample Mean (M)	Standard De- viation (STDEV)	T Statistics (O/STDEV)	P Values
Motivation -> Ease of Use	0.676	0.684	0.051	13.211	0
Motivation -> Perceived Enjoy- ment	0.913	0.913	0.011	80.129	0
Motivation -> per- ceived Usefulness	0.952	0.953	0.007	138.009	0

POSTOL- -> Motivation	0.712	0.716	0.035	20.333	0
POSTOL->instructionsdesign	0.78	0.78	0.034	22.833	0
POSTOL -> instructorcharacteristics	0.708	0.704	0.046	15.478	0
POSTOL> social presence	0.905	0.904	0.011	78.931	0
POSTOL -> trust	0.766	0.767	0.033	23.054	0

**Level of Significance: 5%

Our findings suggest that there is significant positive relationship between the perception of students towards online learning and motivation to use online learning. Therefore, the Hypothesis is safely accepted.

6. Discussion

This study aims to understand the underlying factors that influence an individual's motivation to adopt online learning methods. It identifies that both perception of online teaching methods and motivation to use technology are crucial elements in this context. The Technology Acceptance Model (TAM) has been extensively validated as an important framework for exploring the relationship between motivation and technology adoption, as well as various behavioral intentions among technology users. Research has demonstrated this relationship in areas such as online tax payments [28], computer usage [33], mobile banking [34], and social media usage [35]. These studies highlight that motivation can lead to increased engagement with specific technologies [27].

In this paper, we explored the TAM as a dependent variable, examining whether an improved perception of online teaching methods—represented by the POSTOL scale—can enhance motivation to adopt technology. This understanding is crucial, as a highly motivated individual is more likely to embrace technology, particularly online learning methods. This insight is valuable for those planning to adopt online education for knowledge dissemination, suggesting that motivated individuals are more likely to enroll in such courses compared to those less motivated to utilize these educational methods.

The proposed model was found to be significant, corroborating findings by [27], who identified a positive association between technology adoption and the likelihood of using online tools in various educational settings. Furthermore, literature has shown that intrinsic motivation can be influenced by teaching strategies, including increased student participation, enhanced group relationships, and improved student confidence [36]. Instructor beliefs also significantly impact how educators adopt new ICT teaching

methods [37]. This is particularly relevant in India, where online learning is still not widely adopted across many educational institutions.

7. Implications

This study was conducted at the onset of the COVID-19 pandemic, when educational institutions were compelled to transition to online learning to ensure the continuity of classes. The respondents in this study were individuals engaged in courses and training programs that necessitated adaptation to these new circumstances.

In India, online education has not been a popular mode of teaching, with many institutions adhering to the traditional “chalk and talk” approach. Barriers such as low internet penetration compared to other developing countries, along with limited access to computers and smart devices in tier-3 cities, pose significant challenges. Furthermore, online teaching has primarily been used as a supplement to primary and secondary education, while master's programs and test preparations have seen a greater market share in the online education sector [38].

This study highlights that factors such as a supportive instructor, prompt problem resolution, and frequent interactions are critical for motivating students to adopt online teaching methods. Additionally, trust plays a vital role; it is essential for online education to ensure a better learning experience and grades compared to traditional teaching methods. Active group discussions and user-friendly learning materials will also enhance both intrinsic and extrinsic motivation among prospective learners, making them more inclined to transition from traditional to internet-based teaching methods.

The findings hold practical implications for new entrants in the online education industry, including schools, universities, autonomous education institutes, coaching centers, and private tutors. Understanding the motivational factors of the Indian student community is crucial for designing curricula and selecting instructors that effectively attract students to their courses. This study serves as a valuable resource for ed-tech startups—both existing and emerging—as they strive to assist schools and colleges in transitioning online. As noted by [39], educators, pedagogical approaches, and school environments must cultivate an atmosphere conducive to educational innovations.

Research indicates that demand for online courses has surged post-COVID-19, with venture capital firms expressing strong interest in investing in these startups. In the first half of 2020, educational startups raised approximately \$795 million, compared to \$296 million in the latter half of the previous year [40]. This growth reflects the potential of online education markets in the post-COVID era, where service providers will compete to offer the best courses with high student engagement. Designing courses that consider factors influencing prospective users' perceptions and motivations will be pivotal to their success. Additionally, this study has implications for overseas colleges, universities, and corporations offering courses to students in India, particularly as they may avoid international travel. There exists an opportunity to explore the vast Indian market and cater to a diverse student population.

8. Conclusion

This study demonstrates a significant positive association between perception and motivation regarding the use of online learning mediums. The empirical results provided meaningful insights, revealing that improving perception by enhancing factors such as instructor characteristics, instructional design, trust, and social presence can aid universities and corporations in designing widely accepted online courses. We presented a framework to examine the causal relationship between perception and motivation, with findings indicating that perception significantly impacts motivation.

Research on human behavior supports the notion that motivation influences behavioral intention, which in turn affects actual behavior. A highly motivated individual is more likely to adopt and excel in online learning, particularly in light of the greater significance this has gained post-COVID-19. Measures taken by schools, universities, curriculum developers, and ed-tech companies to reinforce the critical aspects of perception and motivation can yield substantial benefits for both service providers and users.

9. Limitations and Scope for Future Research

While this study contributes significantly to understanding student perception and motivation, several other interacting factors affecting the online learning environment remain unexplored. These include students' expectations, beliefs of institutions providing online education, teaching standards, and assessment criteria.

Additionally, the impact of motivation on behavioral intention and subsequent behavior is an important phenomenon that warrants further exploration. Studies have shown that behavioral intention positively affects behavior [41,42] posited behavioral intention as a predictor of action. Future research should investigate these aspects to provide a more holistic understanding of students' online learning behavior.

10. Compliance with Ethical Standards

Disclosure of potential conflicts of interest: There is no conflict of interest.

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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