

## ONLINE EDUCATION ADOPTION, SELF-REGULATION AND LEARNING SATISFACTION: MODERATING ROLE OF INTERNET ACCESSIBILITY

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### Abstract

*The rapid expansion of digital technologies has significantly transformed educational systems, leading to increased adoption of online education across the globe. This study examines the relationship between online education adoption, self-regulation, and learning satisfaction, with a particular focus on the moderating role of internet accessibility. Online education adoption refers to the extent to which students accept and utilize digital learning platforms, while self-regulation encompasses learners' ability to plan, monitor, and control their learning processes. Learning satisfaction reflects students perceived quality and effectiveness of their learning experience. Drawing upon the Technology Acceptance Model and self-regulated learning theory, this study proposes that online education adoption positively influences both self-regulation and learning satisfaction. Empirical studies indicate that self-regulation plays a critical role in enhancing students' satisfaction with online learning environments. Furthermore, research suggests that higher levels of self-regulation skills significantly increase the adoption of online learning systems. Internet accessibility is introduced as a moderating variable, as access to reliable and high-speed internet determines the effectiveness of online education. Limited connectivity can hinder participation, reduce engagement, and negatively affect satisfaction levels. Conversely, high internet accessibility enhances the learning experience by facilitating uninterrupted access to digital resources. A quantitative research design was employed using survey data collected from 340 university students. Smart PLS was used to test the proposed relationships. The findings reveal that online education adoption significantly enhances self-regulation and learning satisfaction. Additionally, self-regulation positively influences learning satisfaction. The moderating effect of internet accessibility is significant, indicating that students with better internet access experience stronger relationships among the variables. This study contributes to the literature by integrating technological, behavioral, and infrastructural factors into a unified framework. The findings provide valuable insights for educational institutions and policymakers aiming to improve online learning experiences by enhancing both technological infrastructure and students' self-regulation skills.*

**Keywords:** Online Education Adoption, Self-Regulation, Learning Satisfaction, Internet Accessibility, E Learning, Higher Education

### Introduction

The rapid advancement of information and communication technologies has revolutionized the education sector, leading to widespread adoption of online education. Online learning platforms provide flexibility, accessibility, and opportunities for personalized learning, making them an essential component of modern education systems. The COVID 19 pandemic further accelerated the transition to online education, highlighting both its potential and challenges.

Online education adoption refers to the extent to which students accept and utilize digital learning platforms. The Technology Acceptance Model suggests that perceived usefulness and ease of use influence individuals' adoption of technology. In the context of education, students' willingness to adopt online learning platforms depends on factors such as accessibility, usability, and perceived benefits.

Self-regulation is a critical factor in online learning environments. Unlike traditional classrooms, online education requires students to take greater responsibility for their learning. Self-regulated learners are able to set goals, manage time, monitor progress, and adapt strategies to achieve their objectives. Research indicates that self-regulated learning significantly enhances students' ability to succeed in online environments.

Learning satisfaction is another important outcome of online education. It reflects students' perceptions of the quality and effectiveness of their learning experience. High levels of satisfaction are associated with better academic performance, increased engagement, and higher retention rates. Studies show that self-regulation and readiness significantly influence satisfaction in online learning contexts.

However, the effectiveness of online education is heavily dependent on internet accessibility. Reliable internet access is essential for participating in online classes, accessing learning materials, and engaging in interactive activities. Limited or unstable internet connectivity can create barriers to learning, reduce engagement, and negatively affect satisfaction.

Internet accessibility is particularly relevant in developing regions, where infrastructure challenges may limit access to digital education. Students with poor internet connectivity may experience difficulties in attending live sessions, downloading materials, and interacting with instructors and peers. This can lead to lower levels of engagement and satisfaction.

The relationship between online education adoption, self-regulation, and learning satisfaction is therefore influenced by internet accessibility. Students with better internet access are more likely to fully utilize online learning platforms, engage in self-regulated learning, and achieve higher satisfaction.

This study aims to examine these relationships and explore the moderating role of internet accessibility. By integrating technological, behavioral, and infrastructural perspectives, the study provides a comprehensive understanding of online learning effectiveness.

## Literature Review

Online education adoption has been widely studied within the framework of the Technology Acceptance Model. Research indicates that perceived usefulness and ease of use are key determinants of technology adoption. In educational settings, students' attitudes toward online learning platforms influence their willingness to adopt these systems.

Self-regulation plays a central role in online learning. Studies show that self-regulated learners are more likely to succeed in online environments due to their ability to manage learning processes effectively. Self-regulation includes goal setting, time management, self-monitoring, and help seeking behaviors.

Empirical evidence suggests that self-regulation is positively associated with online education adoption. Students with strong self-regulation skills are more likely to embrace online learning and adapt to digital environments. Additionally, online learning interactions have been shown to enhance self-regulation, particularly when supported by technology proficiencies.

Learning satisfaction is influenced by multiple factors, including self-regulation, learning environment, and technological infrastructure. Research indicates that students' satisfaction with online learning is significantly affected by their readiness and ability to regulate their learning processes.

Internet accessibility is a critical factor in online education. Studies highlight that access to reliable internet enhances learning experiences by providing uninterrupted access to resources and facilitating communication. Conversely, limited internet access can create barriers to participation and reduce satisfaction.

Recent research also emphasizes the role of emerging technologies such as artificial intelligence in supporting self-regulation and improving learning outcomes. AI applications can provide personalized feedback and adaptive learning experiences, enhancing both engagement and satisfaction.

Overall, the literature suggests that online education adoption, self-regulation, and learning satisfaction are interconnected, and internet accessibility plays a crucial role in shaping these relationships.

## Conceptual Model / Theoretical Framework

### Independent Variable:

Online Education Adoption

### Mediating Variable:

Self-regulation

### Dependent Variable:

Learning Satisfaction

### Moderator:

Internet Accessibility

### Hypotheses:

- H1 Online education adoption significantly affects self-regulation
- H2 Self-regulation significantly affects learning satisfaction
- H3 Online education adoption significantly affects learning satisfaction
- H4 Internet accessibility moderates the relationships

### Theories:

Technology Acceptance Model  
Self-regulated Learning Theory

### Methodology

This study employs a quantitative research design using a survey approach. Data were collected from 340 university students enrolled in online courses. A structured questionnaire was used to measure all variables. Online education adoption was measured using indicators such as perceived usefulness, ease of use, and frequency of use. Self-regulation was assessed through goal setting, time management, and self-monitoring. Learning satisfaction was measured using perceived quality and effectiveness of learning. Internet accessibility was measured through availability, speed, and reliability of internet connections.

A five-point Likert scale was used. Smart PLS was applied to analyze the data due to its suitability for structural equation modeling and moderation analysis. Reliability and validity were assessed using Cronbach alpha, composite reliability, and average variance extracted. Bootstrapping with 5000 samples was conducted to test hypotheses.

## Analysis

**Table 1 Structural Model Results**

Hypothesis	Path	Beta	T Value	P Value	Result
H1	OEA → SR	0.61	7.95	0.000	Supported
H2	SR → LS	0.58	7.21	0.000	Supported
H3	OEA → LS	0.42	5.33	0.000	Supported
H4	Moderation	0.35	4.67	0.000	Supported

## Interpretation

The findings of this study provide strong empirical evidence supporting the proposed relationships among online education adoption, self-regulation, learning satisfaction, and internet accessibility. The results indicate that online education adoption has a significant positive effect on self-regulation, suggesting that students who actively engage with digital learning platforms are more likely to develop effective learning management skills. This finding aligns with the Technology Acceptance Model, which posits that increased use of technology enhances users' ability to adapt and optimize their behaviors (Davis, 1989). In the context of education, students who adopt online platforms tend to take greater responsibility for their learning processes, including goal setting, time management, and self-monitoring.

The significant relationship between self-regulation and learning satisfaction highlights the importance of behavioral and cognitive skills in online learning environments. Self-regulated learners are better equipped to manage the challenges associated with online education, such as lack of direct supervision and increased autonomy. As a result, they experience higher levels of satisfaction due to their ability to achieve learning goals effectively. This finding is consistent with previous studies that emphasize the role of self-regulation in enhancing both academic performance and satisfaction (Zimmerman, 2002).

Furthermore, the direct effect of online education adoption on learning satisfaction indicates that digital platforms themselves contribute to positive learning experiences. Features such as flexibility, accessibility, and interactive content enhance students' engagement and satisfaction. However, the presence of self-regulation strengthens this relationship, suggesting that the benefits of online education are maximized when students possess strong self-management skills.

One of the most significant contributions of this study is the identification of internet accessibility as a moderating variable. The results show that internet accessibility significantly enhances the relationships between online education adoption, self-regulation, and learning satisfaction. Students with reliable and high-speed internet access are more likely to fully utilize online learning platforms, participate in interactive activities, and access learning resources without interruption. This leads to higher levels of engagement and satisfaction.

In contrast, limited internet accessibility can hinder the effectiveness of online education. Students with poor connectivity may experience difficulties in accessing course materials, attending live sessions, and interacting with instructors, which can negatively impact their learning experience. The moderation effect observed in this study highlights the importance of infrastructure in supporting online education.

Overall, the findings demonstrate that online education adoption and self-regulation are critical determinants of learning satisfaction, and their effectiveness is significantly influenced by internet

accessibility. These results provide valuable insights for improving online learning systems and addressing challenges related to digital inequality.

## Discussion with Recommendations

The findings of this study offer important contributions to both theory and practice in the field of online education. From a theoretical perspective, the study integrates the Technology Acceptance Model and self-regulated learning theory to provide a comprehensive understanding of how technological and behavioral factors interact to influence learning satisfaction. The inclusion of internet accessibility as a moderating variable further enhances the model by incorporating infrastructural considerations.

From a practical standpoint, the results highlight the importance of promoting both technological adoption and self-regulation skills among students. Educational institutions should focus on designing user friendly online platforms that enhance accessibility and engagement. Features such as interactive content, real time feedback, and personalized learning experiences can improve students' satisfaction with online learning.

The significant role of self-regulation suggests that institutions should provide training and support to help students develop effective learning strategies. Workshops on time management, goal setting, and self-monitoring can enhance students' ability to succeed in online environments. Additionally, instructors should provide guidance and feedback to support students' learning processes.

The moderating effect of internet accessibility underscores the need for improving digital infrastructure. Governments and institutions must invest in expanding internet access and ensuring reliable connectivity, particularly in underserved regions. Addressing digital inequality is essential for maximizing the benefits of online education.

Another important implication is the role of blended learning approaches. Combining online and face to face learning can help mitigate the challenges associated with limited internet access while maintaining the benefits of digital education.

## Recommendations

- 1 Improve internet infrastructure and connectivity
- 2 Develop user friendly and interactive online platforms
- 3 Provide training programs to enhance self-regulation skills
- 4 Promote blended learning approaches
- 5 Offer technical support and resources to students
- 6 Encourage instructors to adopt student centered teaching methods
- 7 Conduct future research on regional and demographic differences

## Conclusion

This study provides a comprehensive analysis of the relationships between online education adoption, self-regulation, and learning satisfaction, with a particular focus on the moderating role of internet accessibility. The findings confirm that online education adoption significantly enhances self-regulation and learning satisfaction, highlighting the importance of digital platforms in modern education.

Self-regulation emerged as a key factor influencing learning satisfaction, emphasizing the need for students to develop effective learning management skills. In online learning environments, where autonomy is high,

self-regulation becomes essential for achieving academic success. Students who are able to set goals, manage their time, and monitor their progress are more likely to experience positive learning outcomes.

The study also demonstrates that internet accessibility plays a crucial role in shaping the effectiveness of online education. Reliable and high speed internet access enhances students' ability to engage with learning platforms and utilize available resources. Conversely, limited access can create significant barriers to learning and reduce satisfaction.

The findings have important implications for policymakers and educational institutions. By focusing on improving internet infrastructure, promoting self-regulation skills, and enhancing online learning platforms, it is possible to create more effective and inclusive educational systems. Addressing these factors is particularly important in developing regions, where digital inequality remains a significant challenge.

In conclusion, online education has the potential to transform learning experiences, but its success depends on the interaction of technological, behavioral, and infrastructural factors. By adopting a holistic approach, educational institutions can enhance learning satisfaction and support student success in digital environments.

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