

A Study on the Effect of Online Courses and Their Learning Outcomes Among College Students in Nagapattinam Region

Mr. S. Ajayrathna¹, S. Viveka²

¹Assistant Professor, Department of Management Studies and Research, EGS Pillay Engineering College, Nagapattinam, Tamil Nadu.

²MBA Student, Department of Management Studies and Research, EGS Pillay Engineering College, Nagapattinam, Tamil Nadu.

Received: 17 May 2026

Revised: 19 May 2026

Accepted: 21 May 2026

Published: 24 May 2026

Abstract: The study examines the effect of online courses on learning outcomes among college students in the Nagapattinam region. Online learning has become an important part of education due to the growth of digital technology and internet access. Online courses help students improve knowledge, develop skills, and gain flexibility in learning. The main objective of this study is to understand how online courses influence students' learning outcomes and academic development. Primary data for the study were collected from 150 respondents through a structured questionnaire. Statistical tools such as percentage analysis, Chi-square test, correlation analysis, and ANOVA were used to analyze the collected data. The findings show that online courses positively influence students' learning outcomes by improving subject understanding and learning flexibility. However, challenges such as internet connectivity issues and a lack of direct interaction were also identified. The study concludes that online courses play an important role in supporting students' educational development.

Keywords: Online Courses, Learning Outcomes, E-learning, Student Performance, Digital Education.

I. INTRODUCTION

Online courses have become an important part of education due to the rapid growth of digital technology and internet access. College students increasingly use online learning platforms to deepen their knowledge, develop skills, and access educational resources. Online courses provide flexibility in learning, allowing students to learn anytime and anywhere according to their convenience. Various online platforms offer courses in different fields, helping students improve both academic and practical knowledge.

Learning outcomes are important in measuring students' understanding, knowledge improvement, and skill development through the learning process. Online courses are expected to improve students' subject knowledge, learning flexibility, and independent learning ability. At the same time, some challenges, such as poor internet connectivity, lack of direct interaction, and difficulty in maintaining concentration, may affect learning effectiveness. Therefore, the present study focuses on the effect of online courses and their learning outcomes among college students in the Nagapattinam region. The study aims to understand how online courses influence students' educational development and learning experience.

II. NEED FOR THE STUDY

The use of online courses has increased rapidly among college students due to the growth of digital learning and internet accessibility. Online courses help students improve their knowledge, gain new skills, and access learning materials in a flexible manner. However, the effectiveness of online courses on students' learning outcomes needs proper examination. Therefore, this study is important to understand the effect of online courses and their learning outcomes among college students in the Nagapattinam region and to identify their influence on students' educational development and academic improvement.

III. RESEARCH GAP

Although several studies have examined online learning and digital education, limited research has focused specifically on the effect of online courses and their learning outcomes among college students in the Nagapattinam region. Previous studies mainly discussed the advantages and challenges of online learning, while fewer studies analyzed its effect on students' learning outcomes using statistical tools such as the chi-square test, correlation analysis, and ANOVA. Therefore, this study attempts to fill this gap.

IV. OBJECTIVES OF THE STUDY

1. To examine how online courses influence the learning performance of students.
2. To analyze the role of online courses in improving practical knowledge and skill development.
3. To study the level of students' satisfaction with online courses and their learning experience.
4. To identify the major challenges faced by students while learning through online courses.
5. To identify possible measures for enhancing the effectiveness of online courses in achieving better learning outcomes.

V. SCOPE OF THE STUDY

The study focuses on examining the effect of online courses on learning outcomes among college students in the Nagapattinam region. It aims to understand how online courses influence students' subject knowledge, academic performance, and learning experience. The findings may help in understanding the role of online courses in improving students' educational development.

VI. REVIEW OF LITERATURE

1. Robert M. Bernard (2004) Bernard and his research team examined the effectiveness of distance education compared with traditional classroom instruction. The study found that online learning can produce learning outcomes similar to classroom education when proper instructional methods are applied. Student-teacher interaction and course structure were identified as important factors for successful learning.
2. Barbara Means (2010). The study revealed that students involved in online learning often performed better than students in face-to-face learning environments. Flexibility, self-paced learning, and access to digital materials were identified as major advantages of online education.
3. Elaine Allen & Jeff Seaman (2011) studied the growth of online education in higher education institutions. The research found a rapid increase in student enrollment in online courses. The study concluded that technology has significantly expanded access to education and increased student participation in digital learning.
4. Tony Bates (2019). The study found that online learning platforms improve accessibility to educational materials and support flexible learning. The research emphasized student-centered learning through digital technologies.
5. UNESCO (2020). The report found that digital platforms helped students continue their education during lockdown periods. However, challenges such as poor internet connectivity and a lack of technological access were also highlighted.
6. Bedi (2023). The study showed that interactive activities, timely instructor communication, and digital collaboration improve students' learning motivation and academic performance.
7. Duncan Culbreth & Florence Martin (2025). Culbreth and Martin examined student engagement in asynchronous and synchronous online learning environments. The study found that active participation and interaction significantly improve student engagement and learning outcomes in online education.
8. Marina Glushenkova (2025). The study found that although students value digital learning materials, active usage and participation are important for better academic outcomes.
9. Deepti Sinha (2026). The study revealed that online learning positively affects student engagement and academic experiences, but technological challenges can influence learning effectiveness.

VII. RESEARCH METHODOLOGY

A. Research Design

Research design refers to the overall plan or structure of the study. This study follows a descriptive research design. A descriptive research design is used to describe the characteristics, behavior, and opinions of respondents. It is suitable for this study because the research aims to understand students' views about online courses and their learning outcomes. This design helps in presenting clear information about how online courses affect students in terms of knowledge, skills, satisfaction, and challenges. It also helps in identifying patterns and trends in the responses collected from students.

VIII. DATA ANALYSIS AND INTERPRETATION

A. Demographic Profile of Respondents

This section presents the demographic profile of the respondents selected for the study. Demographic characteristics such as age, educational qualification, field of study, and frequency of attending online courses were analyzed to understand the background of the respondents.

Table 1: Demographic and Online Learning Profile of Respondents

Variable	Majority Response	Percentage
Age Group	22–25 years	46.0%
Educational Qualification	Undergraduate	56.0%
Field of Study	Science	32.7%
Online Course Frequency	Regularly	57.3%

Source: Computed

The table indicates that the majority of respondents belonged to the age group of 22–25 years and were undergraduate students. Most respondents belonged to the science stream and regularly attended online courses, indicating active participation in online learning.

B. Online Course Effectiveness and Learning Outcomes

This section analyzes respondents' perceptions regarding the effectiveness of online courses and their contribution to learning outcomes. Variables related to subject understanding, knowledge improvement, skill development, and overall satisfaction were examined.

Table 2: Perceived Benefits and Satisfaction with Online Learning Among Respondents

Variable	Majority Response	Percentage
Better Subject Understanding	Agree	44.0%
Easy Learning of New Topics	Agree	60.0%
Improvement in Academic Knowledge	Agree	51.3%
Learning at Own Pace	Agree	64.0%
Gaining Practical Knowledge	Agree	59.3%
Career Skill Development	Agree	56.0%
Overall Satisfaction	Agree	70.7%

Source: Computed

The findings reveal that respondents had a positive perception of online courses. A majority agreed that online courses improve subject understanding, academic knowledge, practical learning, and career-related skills. Respondents also expressed high levels of satisfaction and believed that online learning provides flexibility to learn at their own pace.

C. Challenges in Online Learning

This section focuses on the challenges experienced by students during online learning. Factors such as concentration, technical issues, time management, and screen-time fatigue were analyzed.

Table 3: Challenges Faced by Respondents in Online Learning

Variable	Majority Response	Percentage
Difficulty in Staying Focused	Agree	56.7%
Technical Problems	Agree	58.0%
Difficulty in Time Management	Agree	61.3%
Screen-Time Tiredness	Agree	54.7%

Source: Computed

The findings indicate that respondents experienced several challenges during online learning. Most respondents reported difficulty in staying focused, managing time effectively, and dealing with technical issues. Long screen exposure was also identified as a major factor causing tiredness among students.

D. Chi-Square Analysis

Chi-square analysis was conducted to determine whether there is a significant relationship between educational qualification and career-related skills developed through online courses.

H_0 : There is no significant relationship between educational qualification and skills useful for a future career through online courses.

H_1 : There is a significant relationship between educational qualification and skills useful for a future career through online courses.

Table 4: Chi-Square Analysis of the Relationship between Educational Qualification and Career Skill Development

Variables	Chi-Square Value	df	Significance value	Result
Educational Qualification × Career Skills	7.013	2	0.030	Significant Relationship

Source: Computed

The findings reveal a significant relationship between educational qualification and career-related skills developed through online courses, as the significance value (0.030) is less than 0.05. This indicates that educational qualification influences the development of career-related skills through online learning.

E. Correlation Analysis

Correlation analysis was conducted to examine the relationship between better subject understanding and improvement in learning performance through online courses.

Table 5: Correlation Analysis between Better Subject Understanding and Improvement in Learning Performance

Variables	Mean	Standard Deviation	Correlation Value ®	Significance value
Better Subject Understanding	4.09	0.745	0.175	0.033
Improvement in Learning Performance	3.83	0.693	0.175	0.033

Source: Computed

The findings indicate a positive relationship between better subject understanding and improvement in learning performance through online courses. Since the significance value (0.033) is less than 0.05, the relationship is statistically significant. This suggests that a better understanding of subjects through online courses contributes to improved learning performance.

F. ANOVA Analysis

One-way ANOVA analysis was carried out to examine whether there is a significant difference in overall satisfaction with online courses based on the frequency of attending online courses.

H_0 : There is no significant difference in overall satisfaction with online courses based on the frequency of attending online courses.

H_1 : There is a significant difference in overall satisfaction with online courses based on the frequency of attending online courses.

Table 6: ANOVA Results for Online Course Frequency and Overall Satisfaction

Variable	F Value	df	Significance value	Result
Online Course Frequency × Overall Satisfaction	2.002	2	0.139	No Significant Difference

Source: Computed

The findings reveal that there is no significant difference in overall satisfaction with online courses based on the frequency of attending online courses, as the significance value (0.139) is greater than 0.05. This indicates that respondents' satisfaction levels remain similar regardless of how frequently they attend online courses.

IX.FINDINGS

The study found that respondents generally had a positive perception of online courses, particularly in terms of subject understanding, academic knowledge, learning performance, and skill development. Respondents expressed positive opinions regarding practical knowledge, career-related skills, flexibility in learning, and self-paced learning through online courses. The majority of respondents expressed satisfaction with online courses, indicating the effectiveness of online learning among college students. The study identified certain challenges in online learning, including difficulty in concentration, time management issues, technical problems, and tiredness caused by prolonged screen time. A significant relationship was identified between educational qualification and career-

related skills developed through online courses ($p = 0.030$), indicating that educational background influences skill development. A positive and significant relationship was found between better subject understanding and improvement in learning performance ($r = 0.175$, $p = 0.033$), suggesting that improved understanding contributes to better learning performance. No significant difference was found in overall satisfaction with online courses based on attendance frequency ($F = 2.002$, $p = 0.139$), indicating similar satisfaction levels among respondents irrespective of participation frequency.

X.SUGGESTIONS

- Educational institutions should encourage students to actively participate in online courses to improve learning outcomes and skill development.
- Online course providers should include more interactive activities and practical tasks to enhance student engagement and improve learning effectiveness.
- Better technical support and internet accessibility should be provided to reduce technical difficulties experienced during online learning.
- Instructors should maintain effective communication and provide timely feedback to improve students' learning experiences.
- Strategies to improve concentration and time management should be introduced to help students overcome challenges in online learning.
- Real-life examples and practical applications should be incorporated more frequently to improve understanding and knowledge application.

XI.CONCLUSION

The study highlights that online courses play a significant role in improving students' learning outcomes by enhancing subject understanding, academic knowledge, learning performance, and skill development. Students generally expressed positive perceptions towards online learning, particularly regarding flexibility, accessibility, and opportunities for self-paced learning. Online courses were also found to support practical knowledge and career-related skill development, contributing to both academic and professional growth.

However, several challenges, such as difficulty in concentration, technical issues, time management problems, and screen-time fatigue, continue to affect the effectiveness of online learning. Although satisfaction levels remained similar among respondents irrespective of attendance frequency, improving interaction, technical support, and practical engagement can further strengthen the quality of online education. Overall, online learning has become an important educational approach that positively contributes to students' academic and skill development when supported with effective strategies and learning resources.

XII. REFERENCES

1. R. M. Bernard, et al., "Review of Educational Research," vol. 74, no. 3, pp. 379-439, 2004. [Publisher Link](#)
2. B. Means, "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.U.S. Department of Education," 2010. [Google Scholar](#) | [Publisher Link](#)
3. I. Elaine Allen, and Jeff Seaman, "Going the Distance: Online Education in the United States," *Babson Survey Research Group*, 2011. [Google Scholar](#) | [Publisher Link](#)
4. Sean B. Eom, and Nicholas Ashill, "The Determinants of Students' Perceived Learning Outcomes and Satisfaction in University Online Education," *Decision Sciences Journal of Innovative Education*, 2016. [Google Scholar](#) | [Publisher Link](#)
5. F. Martin, and D. U. Bolliger, "Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment," *Online Learning Journal*, vol. 22, no. 1, pp. 205-222, 2018. [Google Scholar](#) | [Publisher Link](#)
6. Bates, A. W. Tony, "Teaching in a Digital Age: Guidelines for Designing Teaching and Learning," *BCcampus*, 2019. [Google Scholar](#) | [Publisher Link](#)
7. UNESCO, "Distance Learning Strategies in Response to COVID-19 School Closures," 2020. [Google Scholar](#) | [Publisher Link](#)
8. Akanksha Bedi, "Keep Learning: Student Engagement in an Online Environment," *Online Learning*, vol. 27, no. 2, 2023. [Publisher Link](#)
9. Duncan Culbreth, and Florence Martin, "Exploring the Role of Synchrony in Asynchronous, Synchronous, and Quasi-Synchronous Online Learner Engagement," *Educational Technology Research and Development*, 2025. [Google Scholar](#) | [Publisher Link](#)
10. Mensah Prince Osiesi, Musa Adekunle Ayanwale, and Stella Oluwakemi Olatunbosun, "Unpacking the Dynamics of Online Learning in Higher Education Through the Interplay of Engagement, Readiness, and Attitudes," *Discover Education*, 2025. [Google Scholar](#) | [Publisher Link](#)
11. Marina Glushenkova, Lu Chen, and Yury Mikhaylov, "Mind the Gap: The Realities of Students'Engagement with Online Learning Resources," *Active Learning in Higher Education*, 2025. [Google Scholar](#) | [Publisher Link](#)

12. F. Sehkar Fayda-Kinik, "Digital Educational Environments in Higher Education: An Organizational Perspective on Contextual Predictors of E-Learning Attitudes," *Education and Information Technologies*, 2026. [Google Scholar](#) | [Publisher Link](#)
13. Deepti Sinha et al., "Impact of Online Learning on Students' Perception Towards Ergonomics, Academic Experience, and Engagement in Higher Education Institutions," *Humanities and Social Sciences Communications*, 2026. [Google Scholar](#) | [Publisher Link](#)