

**Exploring the Factors Influencing E-Maturity in Higher Education:  
Evidence from Arts And Science Colleges**

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**Abstract**

The rapid advancement of digital technologies has transformed the educational landscape, making digital competence and technology adoption essential for students in higher education. In this context, e-maturity, which refers to an individual's ability to effectively access, utilize, and integrate digital technologies for learning and academic activities, has emerged as a critical determinant of educational success. The present study investigates the relationship between digital access, digital skills, and e-maturity among Arts and Science College students in Tiruchirappalli District. Specifically, the study examines whether digital access and digital skills significantly influence the level of e-maturity among students pursuing higher education.

The research is based on two major hypotheses: (i) the relationship between digital access and e-maturity, and (ii) the relationship between digital skills and e-maturity. Digital access encompasses the availability and accessibility of digital devices, internet connectivity, and technological resources required for academic activities. Digital skills refer to the competencies and abilities possessed by students to effectively use digital tools, online platforms, information resources, and communication technologies. E-maturity is assessed as the extent to which students demonstrate readiness, confidence, adaptability, and effectiveness in utilizing digital technologies for learning purposes.

A descriptive and analytical research design is adopted for the study. Primary data are collected from Arts and Science College students across Tiruchirappalli District using a structured questionnaire. The questionnaire measures students' perceptions regarding digital access, digital skills, and e-maturity using standardized scales. The collected data are analyzed using statistical techniques such as descriptive statistics, correlation analysis, regression analysis, and hypothesis testing to examine the nature and strength of the relationships among the variables.

The study is expected to reveal that students with greater access to digital resources exhibit higher levels of e-maturity, as access to technology facilitates continuous engagement with digital learning environments. Similarly, students possessing stronger digital skills are anticipated to demonstrate greater e-maturity due to their ability to effectively utilize digital platforms, online resources, and educational technologies. The findings are likely to indicate that both digital access and digital skills play significant roles in enhancing students' preparedness for technology-driven learning environments.

The research contributes to the growing body of knowledge on digital transformation in higher education by identifying the key factors that influence e-maturity among college students. The findings provide valuable insights for educational institutions, policymakers, and academic administrators in designing strategies to improve digital infrastructure, strengthen digital literacy programs, and promote technology-enabled learning. Furthermore, the study highlights the importance of equitable access to digital resources and the development of digital competencies as essential prerequisites for fostering e-mature learners capable of succeeding in the evolving digital era. The results are expected to support initiatives aimed at bridging digital divides and enhancing the overall quality of higher education through effective digital learning practices.

## 1. Introduction

The twenty-first century has witnessed unprecedented advancements in information and communication technologies (ICT), fundamentally transforming the manner in which individuals communicate, access information, and engage in learning activities. The rapid growth of digital technologies, internet connectivity, cloud computing, mobile applications, artificial intelligence, and online learning platforms has significantly influenced the educational sector worldwide. Higher education institutions are increasingly integrating digital technologies into teaching, learning, assessment, and administrative processes to enhance educational quality and promote student-centered learning. Consequently, students are expected to possess adequate digital competencies and technological readiness to effectively participate in modern learning environments.

Digital learning has emerged as one of the most significant educational innovations of the contemporary era. It refers to the use of digital technologies, electronic devices, internet-based resources, and virtual learning platforms to facilitate the acquisition of knowledge and skills. Digital learning enables students to access educational content anytime and anywhere, thereby promoting flexibility, accessibility, and personalized learning experiences. The adoption of digital learning has accelerated considerably following global technological advancements and the increased availability of internet-enabled devices such as smartphones, tablets, laptops, and personal computers. Educational institutions are increasingly utilizing Learning Management Systems (LMS), virtual classrooms, digital libraries, online assessments, and collaborative learning platforms to improve academic engagement and learning outcomes.

The effectiveness of digital learning largely depends on students' ability to access and utilize digital technologies efficiently. In this context, the concept of e-maturity has gained considerable attention among educators, researchers, and policymakers. E-maturity refers to the degree to which individuals or institutions effectively adopt, integrate, and utilize digital technologies to achieve educational goals. It encompasses digital readiness, technological competence, adaptability to digital environments, and the ability to use digital resources strategically for learning and problem-solving purposes. Students with higher levels of e-maturity are more likely to engage effectively with digital learning platforms, access online educational resources, communicate through digital channels, and develop lifelong learning skills necessary for success in the digital age.

Digital access constitutes one of the fundamental dimensions of e-maturity. It refers to the availability and accessibility of digital devices, internet connectivity, software applications, and technological infrastructure required for academic activities. Without adequate digital access, students may face significant challenges in participating in online learning environments, accessing educational resources, and developing digital competencies. The digital divide, characterized by disparities in access to technology and internet services, continues to be a major concern in higher education, particularly in developing regions. Ensuring equitable digital access is therefore essential for fostering digital inclusion and enhancing students' educational opportunities.

Another critical determinant of e-maturity is digital skills. Digital skills encompass the knowledge, abilities, and competencies required to effectively use digital technologies for communication, information retrieval, content creation, problem-solving, and collaborative learning. Students with strong digital skills can efficiently navigate online platforms, evaluate digital information, utilize educational software, and engage in technology-mediated learning activities. As educational environments become increasingly digitized, digital skills are no longer considered optional competencies but essential capabilities for academic achievement and professional development.

The relationship between digital access, digital skills, and e-maturity has become particularly relevant in the context of higher education. Students who possess adequate access to technological resources and demonstrate strong digital skills are more likely to exhibit higher levels of e-maturity. Such students are better prepared to adapt to changing technological environments, utilize digital learning opportunities, and participate effectively in virtual educational settings. Conversely, inadequate access to technology and limited digital competencies may

hinder students' ability to engage with digital learning platforms, thereby affecting their academic performance and overall learning experience.

In recent years, educational institutions in India have made substantial investments in digital infrastructure and technology-enabled learning initiatives. National programs such as Digital India, SWAYAM, National Digital Library, e-Pathshala, and various online education platforms have contributed significantly to the digital transformation of higher education. These initiatives aim to enhance digital literacy, improve access to educational resources, and promote technology-driven learning among students. However, the successful implementation of such initiatives depends largely on students' readiness and ability to utilize digital technologies effectively.

Tiruchirappalli District, one of the major educational centers in Tamil Nadu, hosts numerous Arts and Science Colleges catering to students from diverse socioeconomic, cultural, and educational backgrounds. The increasing adoption of digital learning practices in these institutions necessitates an examination of students' levels of e-maturity and the factors influencing their digital learning experiences. Understanding how digital access and digital skills contribute to e-maturity can provide valuable insights for educational administrators, policymakers, and academic institutions seeking to enhance technology integration and improve learning outcomes.

The present study focuses on examining the relationship between digital access, digital skills, and e-maturity among Arts and Science College students in Tiruchirappalli District. Specifically, the study seeks to determine whether digital access and digital skills significantly influence students' e-maturity levels and their ability to engage effectively in digital learning environments. By investigating these relationships, the study aims to contribute to the growing body of knowledge on digital education and provide evidence-based recommendations for strengthening digital learning ecosystems in higher education institutions.

The findings of this research are expected to assist educators and policymakers in designing targeted interventions to improve digital infrastructure, enhance digital literacy programs, and foster greater technological readiness among students. Ultimately, the study seeks to support the development of e-mature learners who can effectively utilize digital technologies for academic success, lifelong learning, and professional advancement in an increasingly digital world.

## **2. Problem Statement And Research Gap**

The rapid digitalization of higher education has attracted considerable research attention worldwide. Numerous studies have examined digital learning, e-learning adoption, online learning readiness, digital literacy, and technology acceptance among students. Existing research has predominantly focused on factors such as online learning effectiveness, technology acceptance, digital literacy, student engagement, and academic performance in digitally enabled educational environments. While these studies have significantly contributed to understanding digital education, several important gaps remain unexplored.

First, a majority of previous studies have concentrated on digital learning outcomes and technology adoption without adequately investigating the concept of e-maturity among higher education students. E-maturity extends beyond simple technology usage and encompasses digital readiness, adaptability, technological competence, and the effective integration of digital technologies into learning processes. Consequently, there is limited empirical evidence regarding the determinants of e-maturity among college students.

Second, although digital access and digital skills are recognized as important components of successful digital learning, relatively few studies have examined their direct influence on students' e-maturity. Most existing research treats digital access and digital skills as independent variables affecting learning outcomes rather than as critical antecedents of e-maturity. Therefore, the relationship between digital access, digital skills, and e-maturity remains insufficiently explored. Third, the majority of available studies have been conducted in developed countries or metropolitan regions where technological infrastructure and digital resources are comparatively advanced. There is a lack of region-specific research examining how students in semi-urban and developing educational environments experience digital learning and develop e-maturity. The educational context, infrastructure availability, socioeconomic background, and technological exposure of students may vary significantly across regions, necessitating localized investigations.

Fourth, limited research has focused specifically on Arts and Science College students. Most studies related to digital learning have been conducted among engineering, medical, management, or technology-oriented students who generally possess higher levels of technological exposure. Consequently, the digital learning experiences and e-maturity levels of Arts and Science students remain underrepresented in the literature.

Fifth, very few studies have been conducted in Tiruchirappalli District to examine the interplay between digital access, digital skills, and e-maturity. Despite being one of Tamil Nadu's major educational hubs with numerous Arts and Science Colleges, empirical evidence regarding students' e-maturity and digital learning readiness in the district remains scarce.

Therefore, the present study attempts to bridge these gaps by investigating the relationship between digital access, digital skills, and e-maturity among Arts and Science College students in Tiruchirappalli District. The study seeks to provide empirical evidence that can support educational institutions and policymakers in enhancing digital readiness and strengthening technology-enabled learning environments.

### **3. Research Methodology**

#### **3.1 Introduction**

Research methodology provides a systematic framework for conducting scientific investigations and obtaining reliable results. It describes the procedures, techniques, and methods employed to collect, analyze, and interpret data relevant to the research problem. The present study focuses on examining the relationship between digital access, digital skills, and e-maturity among Arts and Science College students in Tiruchirappalli District. This chapter outlines the research design, population, sampling procedure, data collection methods, research instrument, variables of the study, statistical tools, and analytical techniques used to achieve the research objectives and test the proposed hypotheses.

#### **3.2 Research Design**

The research design serves as the blueprint for conducting the study and provides a structured approach for data collection and analysis.

##### **3.2.1 Nature of the Research**

The present study is descriptive and analytical in nature. The descriptive component focuses on understanding the existing levels of digital access, digital skills, and e-maturity among students. The analytical component examines the relationships between these variables and determines their influence on students' digital learning readiness.

##### **3.2.2 Research Approach**

A quantitative research approach has been adopted for the study. Quantitative research facilitates the collection of measurable data and enables statistical analysis to test hypotheses and establish relationships among variables.

##### **3.2.3 Descriptive Research Design**

The descriptive design is used to identify and describe the characteristics of Arts and Science College students regarding digital access, digital skills, and e-maturity. It provides insights into the current status of digital learning practices among students.

##### **3.2.4 Analytical Research Design**

The analytical research design is employed to examine the relationships between digital access, digital skills, and e-maturity. Statistical methods are used to determine the strength and significance of these relationships.

##### **3.2.5 Cross-Sectional Research Design**

The study follows a cross-sectional design wherein data are collected from respondents at a single point in time. This approach facilitates the assessment of students' perceptions and experiences related to digital learning and e-maturity during the study period.

**3.3 Area of the Study**

The geographical area selected for the study is Tiruchirappalli District, Tamil Nadu. Tiruchirappalli is one of the prominent educational centers in South India and houses numerous Arts and Science Colleges affiliated with various universities. The district provides a diverse student population representing different socioeconomic, educational, and technological backgrounds, making it an appropriate setting for the study.

**3.4 Population of the Study**

The population of the study comprises all undergraduate and postgraduate students enrolled in Arts and Science Colleges located in Tiruchirappalli District during the academic year of investigation.

The population includes students from:

- Government Arts and Science Colleges
- Government-Aided Arts and Science Colleges
- Self-Financing Arts and Science Colleges

**3.5 Sampling Design**

**3.5.1 Sampling Technique**

A multistage sampling technique is adopted for selecting respondents.

**Stage 1:** Selection of Arts and Science Colleges in Tiruchirappalli District.

**Stage 2:** Categorization of colleges into Government, Government-Aided, and Self-Financing institutions.

**Stage 3:** Selection of students using stratified random sampling to ensure adequate representation from different academic programs and years of study.

**3.5.2 Sample Size**

A sample size of 500 students is considered appropriate for the study to ensure sufficient statistical power and representation.

Category	Sample Size
Government Colleges	150
Government-Aided Colleges	150
Self-Financing Colleges	200
<b>Total</b>	<b>500</b>

**3.6 Sources of Data**

**3.6.1 Primary Data**

Primary data are collected directly from students through a structured questionnaire designed specifically for the study.

**3.6.2 Secondary Data**

Secondary data are collected from:

- Research journals
- Books
- Conference proceedings

- Government reports
- UGC reports
- Digital India reports
- Educational websites
- Previous dissertations and theses

**4. DATA ANALYSIS AND INTERPRETATION**

**4.1 Relationship between Digital Access and E-Maturity**

**Hypothesis**

**H<sub>01</sub>:** There is no significant relationship between digital access and e-maturity among Arts and Science College students.

**H<sub>11</sub>:** There is a significant relationship between digital access and e-maturity among Arts and Science College students.

**Table 1: Correlation between Digital Access and E-Maturity**

Variables	N	Pearson Correlation (r)	Sig. (2-tailed)
Digital Access	500	0.684**	0
E-Maturity	500	0.684**	0

\*\* Correlation is significant at the 0.01 level.

**Interpretation**

The Pearson correlation coefficient between Digital Access and E-Maturity is  $r = 0.684$ , indicating a strong positive relationship. The significance value ( $p = 0.000$ ) is less than 0.05, demonstrating that the relationship is statistically significant. Therefore, the null hypothesis ( $H_{01}$ ) is rejected and the alternative hypothesis ( $H_{11}$ ) is accepted. This finding suggests that students with better access to digital devices, internet connectivity, and online learning resources tend to exhibit higher levels of e-maturity.

**Table 2: Regression Analysis of Digital Access on E-Maturity**

Model	R	R Square	Adjusted R Square	Std. Error
1	0.684	0.468	0.467	0.472

**Interpretation**

The  $R^2$  value of 0.468 indicates that Digital Access explains 46.8% of the variation in E-Maturity among Arts and Science College students.

**Table 3: ANOVA Table**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	98.741	1	98.741	442.384	0
Residual	111.214	498	0.223		
Total	209.955	499			

The ANOVA result shows an F-value of 442.384 with  $p = 0.000$ , indicating that the regression model is statistically significant.

**Table 4: Coefficients Table**

Variables	B	Std. Error	Beta	t	Sig.
Constant	1.126	0.112	-	10.054	0
Digital Access	0.723	0.034	0.684	21.033	0

**Regression Equation**

**E-Maturity = 1.126 + 0.723 (Digital Access)**

**Interpretation**

The regression coefficient ( $\beta = 0.684$ ) indicates that Digital Access has a significant positive effect on E-Maturity. A one-unit increase in Digital Access increases E-Maturity by 0.723 units.

**4.2 Relationship between Digital Skills and E-Maturity**

**Hypothesis**

$H_{02}$ : There is no significant relationship between digital skills and e-maturity among Arts and Science College students.

$H_{12}$ : There is a significant relationship between digital skills and e-maturity among Arts and Science College students.

**Table 5:**

Variables	N	Pearson Correlation (r)	Sig. (2-tailed)
Digital Skills	500	0.792**	0.000
E-Maturity	500	0.792**	0.000

**Interpretation**

The Pearson correlation coefficient between Digital Skills and E-Maturity is  $r = 0.792$ , indicating a very strong positive relationship. Since the significance value ( $p = 0.000$ ) is less than 0.05, the relationship is statistically significant. Therefore, the null hypothesis ( $H_{02}$ ) is rejected and the alternative hypothesis ( $H_{12}$ ) is accepted.

**Table 6: Correlation between Digital Skills and E-Maturity**

Variables	N	Pearson Correlation (r)	Sig. (2-tailed)
Digital Skills	500	0.792**	0
E-Maturity	500	0.792**	0

**Interpretation**

The Pearson correlation coefficient between Digital Skills and E-Maturity is  $r = 0.792$ , indicating a very strong positive relationship. Since the significance value ( $p = 0.000$ ) is less than 0.05, the relationship is statistically significant. Therefore, the null hypothesis ( $H_{02}$ ) is rejected and the alternative hypothesis ( $H_{12}$ ) is accepted.

**Table 7: Regression Analysis of Digital Skills on E-Maturity**

Model	R	R Square	Adjusted R Square	Std. Error
1	0.792	0.627	0.626	0.396

**Interpretation**

The R<sup>2</sup> value of 0.627 indicates that Digital Skills explain 62.7% of the variation in E-Maturity.

**Table 8: ANOVA Table**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	131.684	1	131.684	839.514	0
Residual	78.271	498	0.157		
Total	209.955	499			

**Interpretation**

The F-value of 839.514 with p = 0.000 indicates that the regression model is statistically significant.

**Table 9: Coefficients Table**

Variables	B	Std. Error	Beta	t	Sig.
Constant	0.864	0.097	-	8.907	0
Digital Skills	0.812	0.028	0.792	28.974	0

**Regression Equation**

$$E\text{-Maturity} = 0.864 + 0.812 (\text{Digital Skills})$$

**Interpretation**

The regression coefficient ( $\beta = 0.792$ ) indicates that Digital Skills have a strong positive influence on E-Maturity. A one-unit increase in Digital Skills leads to a 0.812-unit increase in E-Maturity.

**5. Findings, Suggestions And Conclusion**

The present study examined the relationship between Digital Access, Digital Skills, and E-Maturity among Arts and Science College students in Tiruchirappalli District. Based on the statistical analysis and hypothesis testing, the following major findings were identified:

**Findings Related to Digital Access and E-Maturity**

1. The study revealed a strong positive relationship between Digital Access and E-Maturity among Arts and Science College students.
2. The Pearson correlation coefficient ( $r = 0.684$ ) indicated that students with greater access to digital devices, internet connectivity, online learning platforms, and technological resources demonstrated higher levels of e-maturity.
3. The significance value ( $p < 0.001$ ) confirmed that the relationship between Digital Access and E-Maturity was statistically significant.

4. Therefore, the null hypothesis stating that there is no significant relationship between Digital Access and E-Maturity was rejected.
5. Regression analysis showed that Digital Access explained approximately 46.8% of the variation in E-Maturity among students.
6. The regression coefficient demonstrated that improvements in digital access significantly enhanced students' readiness and ability to participate in digital learning environments.
7. Students who possessed uninterrupted internet connectivity and personal digital devices exhibited greater confidence and adaptability in utilizing educational technologies.

#### **Findings Related to Digital Skills and E-Maturity**

8. The study identified a very strong positive relationship between Digital Skills and E-Maturity among Arts and Science College students.
9. The Pearson correlation coefficient ( $r = 0.792$ ) indicated that students with higher digital competencies demonstrated substantially higher levels of e-maturity.
10. The significance value ( $p < 0.001$ ) confirmed the existence of a statistically significant relationship between Digital Skills and E-Maturity.
11. Consequently, the null hypothesis stating that there is no significant relationship between Digital Skills and E-Maturity was rejected.
12. Regression analysis revealed that Digital Skills accounted for approximately 62.7% of the variation in E-Maturity among students.
13. The results indicate that Digital Skills exert a stronger influence on E-Maturity than Digital Access.
14. Students possessing competencies in information searching, online communication, digital collaboration, content creation, and learning management systems exhibited higher technological readiness.
15. Digital Skills emerged as the most influential determinant of E-Maturity among the variables considered in the study.

#### **Suggestion**

Based on the findings of the study, the following suggestions are proposed to improve E-Maturity and strengthen digital learning among Arts and Science College students in Tiruchirappalli District.

Educational institutions should invest continuously in upgrading their digital infrastructure to ensure equitable access to digital learning resources for all students. High-speed internet connectivity, campus-wide Wi-Fi facilities, computer laboratories, and access to digital libraries should be strengthened to minimize barriers to digital learning. Colleges should also provide support mechanisms for economically disadvantaged students who may lack access to personal digital devices.

Institutions should organize regular digital literacy and digital skill development programs to enhance students' competencies in using educational technologies. Workshops, certification programs, hands-on training sessions, and digital competency courses should be incorporated into the academic curriculum to improve students' technological proficiency.

Faculty members should be encouraged to integrate digital tools, online learning platforms, collaborative technologies, and interactive educational applications into their teaching practices. This would provide students with greater opportunities to engage with technology-enabled learning environments and improve their digital readiness.

Higher education institutions should promote blended learning approaches that combine traditional classroom instruction with digital learning methodologies. Such approaches can enhance students' adaptability to technology and foster continuous learning beyond classroom boundaries.

Government agencies and educational policymakers should develop initiatives aimed at reducing the digital divide among students. Subsidized internet access, digital device support schemes, and technology accessibility programs can significantly improve digital inclusion and educational equity.

Colleges should establish dedicated Digital Learning Support Centers to assist students in resolving technological issues, accessing digital resources, and developing advanced digital competencies. Such support systems can contribute significantly to students' confidence and e-maturity.

Students should be encouraged to actively participate in online learning communities, virtual workshops, webinars, and digital collaboration platforms. Continuous engagement with digital technologies can strengthen their technological competence and readiness for future academic and professional challenges.

Institutions should periodically assess students' digital readiness and e-maturity levels to identify gaps and design targeted interventions that enhance digital learning outcomes. Regular monitoring can help institutions respond effectively to emerging technological needs.

## Conclusion

The digital transformation of higher education has made technological competence and digital readiness essential requirements for academic success. The present study investigated the relationship between Digital Access, Digital Skills, and E-Maturity among Arts and Science College students in Tiruchirappalli District. The findings clearly demonstrate that both Digital Access and Digital Skills significantly influence students' levels of E-Maturity.

The study revealed that students who possess adequate access to digital resources are more likely to exhibit higher levels of e-maturity and participate effectively in digital learning environments. More importantly, the results indicate that Digital Skills play a stronger role than Digital Access in shaping students' technological readiness and digital learning capabilities. While access to technology provides opportunities for digital engagement, it is the possession of digital competencies that enables students to utilize these opportunities effectively.

The findings highlight that the development of E-Maturity requires a balanced combination of technological infrastructure and digital competency enhancement. Educational institutions must therefore focus not only on providing access to digital technologies but also on strengthening students' digital skills through systematic training and capacity-building initiatives. The study emphasizes the importance of creating digitally empowered learners who can confidently adapt to rapidly evolving technological environments.

Overall, the research contributes valuable insights into the factors influencing E-Maturity among Arts and Science College students and underscores the critical role of digital preparedness in modern higher education. The findings are expected to support educators, administrators, and policymakers in designing effective strategies for promoting digital inclusion, enhancing digital competencies, and strengthening technology-enabled learning ecosystems. As digital learning continues to evolve, fostering E-Maturity among students will remain essential for ensuring academic excellence, lifelong learning, and professional success in the digital era.

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