

A Study on Digital Competence of Graduate Students

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Abstract:

The digital transformation in education has led to an increasing emphasis on the development of digital competence among graduate students. Digital competence encompasses a diverse range of skills necessary for navigating, utilizing, and creating knowledge in an increasingly digital world. The study aims to examine the level of Digital Competence among graduate students studying at The ICFAI University Tripura, and also observe if there exist any significant differences on the basis of gender and academic stream. A sample of 219 graduate students were selected using stratified random sampling method, and data was collected with the help of Development and Validation of Students Digital Competence Scale (SDiCoS) by Tzafilkou et al (2022). The findings revealed no significant differences between (i) Male and Female students, and (ii) Science and Arts students in relation to their digital competence. It was also observed that female science students differed significantly with arts graduate students. The paper concludes with recommendations for enhancing digital competence frameworks to better prepare graduate students, for future challenges in a rapidly evolving digital landscape.

Keywords: Digital Competence, Digital Literacy, Graduate Students, Career Readiness.

INTRODUCTION

In today's digital age, proficiency in digital skills is essential for academic success, career readiness, and everyday life. Students of present digital world are expected to navigate digital platforms for learning, communication, and problem-solving, making digital competence a crucial skill set. Digital competence encompasses a broad range of abilities, including information literacy, online communication, content creation, cybersecurity awareness, and problem-solving in digital environments. Despite growing up in a technology-driven world, student's actual digital competence may vary significantly based on factors such as locality, prior exposure, academic discipline, institutional support, and so on. The increasing reliance on digital platforms for academic research, communication, and learning has highlighted the necessity of these competencies. Graduate students today use digital tools for a variety of purposes, from routine classroom tasks, to conducting research and collaborating with peers to discuss their findings and disseminating knowledge through digital publications. In this context, digital competence is no longer an optional skill but a fundamental requirement for academic success, innovation, and career advancement. However, the extent to which graduate students are prepared for these challenges varies significantly across disciplines and institutions.

Gender has long been a subject of study in relation to technology, and it is crucial to understand its role in shaping the digital competence of graduate students. Studies has shown that gender disparities still exist

where women are underrepresented in both academic and professional spheres. These differences in gender distribution across academic streams may lead to variations in digital competence. For instance, female graduate students from science discipline may experience unique challenges related to gender biases, access to digital resources, and encouragement to develop advanced digital skills. On the other hand, female students from social sciences may face different digital learning environments or cultural barriers that impact their digital competence. Examining how gender influences the acquisition and application of digital skills is essential in understanding the broader landscape of graduate students digital readiness. The academic stream or discipline pursued by graduate students plays a significant role in shaping their exposure to and use of digital tools. Graduate students in fields such as science, engineering, and information technology are often immersed in digital environments from the outset, with technical skills forming the core of their training. In contrast, students in the humanities, social sciences, or arts may have less frequent engagement with digital tools, and their digital competence may be developed through a more applied, contextual approach. Understanding how digital competence varies across academic streams helps identify the specific skills and tools necessary for graduate students in different fields, and the unique barriers they may encounter in their learning journeys.

This study is significant because it highlights the need to address disparities in digital competence among graduate students based on gender and academic stream. As digital skills become increasingly essential in both academic and professional contexts, understanding these disparities is crucial for developing inclusive strategies that ensure all students, regardless of background, have the opportunity to acquire and apply the digital skills necessary to succeed. By exploring these factors, the research will contribute to the development of more equitable and effective digital literacy initiatives, ultimately enhancing the digital readiness of graduate students across diverse demographics and educational settings. With these views the research aims to examine how gender and academic stream intersect to influence the digital competence of graduate students.

Objectives:

1. To examine the level of digital competence among the graduate students of ICFAI University Tripura.
2. To find the influence of gender and academic stream on digital competence of graduate students.

Research Studies

Combining bibliometric analysis and systematic review, Ma and Ismail (2025) review highlighted challenges in measuring digital competence, and the need for its integration into education systems. A study by Muammar, Maheshwari, and Atalla (2024), revealed a significant correlation between computer and information skills and student performance. The study focused on academic understanding of Digital Literacy, addressing the changing educational requirements of students. Saha, Paye, and Chattopadhyay (2024) observed that male and female postgraduate students differed insignificantly in digital competency, whereas found a significant difference between (i) Arts and Science stream, and (ii) Urban and Rural postgraduate students, at 0.05 level. The study showed that the students can be made more capable, and more job-oriented with their digital competence. In a cross-sectional study by Patwardhan et al (2023), a significant positive impact of digital competence was found on perceived learning and learning agility, and a significant positive relationship between perceived learning and learning agility. Their study indicated that learners with higher digital competence results with higher learning outcomes and learning agility.

Hypotheses:

H₀₁: Graduate students studying at ICFAI University Tripura do not possess high level of Digital Competence.

H₀₂: There is no significant difference between male and female graduate students in relation to their Digital Competence.

H₀₃: Based on gender, there is an insignificant difference between Science and Arts graduate students in relation to their Digital Competence.

H₀₄: Science and Arts graduate students do not differ significantly in relation to their Digital Competence.

Methodology

Descriptive Survey method is been employed for the present study. Using stratified random sampling technique, a sample of 219 graduate students were selected from ICFAI University Tripura.

Tools:

Development and Validation of Students Digital Competence Scale (SDiCoS) by Tzafilkouet al (2022), was used to examine the digital competence of graduate students.

Statistical Analysis:

Mean, SD, and ‘t’ test were used to analyze the data.

Analysis and Interpretation

H₀₁: Graduate students studying at ICFAI University Tripura do not possess high level of Digital Competence.

Table 1: Level of Digital Competence possessed by the Whole Sample

Mean	Median	True Mode	Skewness	Kurtosis
98.84	97.66	95.3	0.235	0.247

To examine the level of digital competence possessed by the students, the data is organized, and calculated as shown in table 1. From the above table, the distribution seems to be nearly normal, with slight positively skewed (0.235) and with little leptokurtic (0.247).

Table 2: Components of Digital Competence and Order of Digital Skills

Sl #	Components	Mean / item	Order of Digital Skills
1	Search, Find, Access (SFA)	3.629	1
2	Develop, Apply, Modify (DAM)	3.502	5
3	Communicate, Collaborate, Share (CCS)	3.516	4
4	Store, Manage, Delete (SMD)	3.589	3
5	Evaluate (EV)	3.403	6

6	Protect (PR)	3.594	2
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From the means of every component, it is observed that the students have good skills in Search, Find, Access area, when compared to other components, and least skills in the area of Evaluate. According to the table 2, students seem to have good digital skills in SFA, followed by PR, then SMD, CCS, DAM, and lastly EV. It is observed that the students had moderate level of digital competence.

H₀₂: There is no significant difference between male and female graduate students in relation to their Digital Competence.

Table 3: Comparison of Male and Female graduate students in relation to Digital Competency.

Sample	N	Mean	SD	df	't' Value
Male	72	97.86	17.14	217	0.631
Female	147	99.33	14.03		

From table-3, it is seen that the mean score of the male and female graduate students in relation to their digital competency is 97.86 and 99.33 respectively. The obtained 't' value (0.631) which is less than 't' table value (1.971) for 217 degrees of freedom, indicates no significant difference at 0.05 level.

Thus, the hypothesis "there is no significant difference between male and female graduate students in relation to their digital competency", is accepted.

H₀₃: Based on gender, there is an insignificant difference between Science and Arts graduate students in relation to their Digital Competence.

Table 4: Comparison of Science and Art graduate students based on gender.

Sample		N	Mean	SD	df	't' Value
Male	Science	28	101.11	15.39	70	1.34
	Arts	44	95.79	18.02		
Female	Science	60	102.6	14.79	145	2.33
	Arts	87	97.07	13.08		

Table 4 reveals that, 't' calculated value (1.34) is less than 't' table value, indicating insignificant difference between male science and arts graduate students. Whereas female science students differ significantly with arts graduate students at 0.05 level. Means of both male (101.11) and female (102.6) science students show having better digital skills when compared to arts students.

Thus, the hypothesis of insignificant difference between science and arts students in relation to their digital competence, based on gender is accepted in case of male graduate students, and rejected in female graduate students.

H₀₄: Science and Arts graduate students do not differ significantly in relation to their Digital Competence.

Table 5: Comparison of Science and Art graduate students in relation to Digital Competency.

Sample	N	Mean	SD	df	't' Value
Science	100	101.04	14.96	217	1.96
Arts	119	97.07	15.03		

From the above table 5, it is found that science students have better digital competence when compared to that of Arts graduate students. But, the obtained 't' value (1.96) indicates no significant difference between Science and Arts students in their digital competence. Hence, the hypothesis is accepted. There is no significant difference between Science and Art graduate students in relation to their digital competency.

Discussion

In the analysis of present study, findings of the first hypothesis that graduate students possess an average level of digital competency, have been supported by the findings of the Herrea-Lill and Urrejola-Contreras (2024). Saha, Paye, and Chattopadhyay (2024) study was supporting the findings of second hypothesis, indicating no significant difference between male and female graduate students in relation to their digital competence, but was not in favour of fourth hypothesis.

Conclusion

The results of this study indicates that digital competence among graduate students does not vary significantly based on gender or academic stream. It is also observed that female graduates differ significantly based on their academic stream. Both genders demonstrated similar levels of digital skills, suggesting that there may be a growing gender parity in digital competencies within higher education. The lack of significant differences across academic streams is also noteworthy. This suggests that digital literacy has become an essential skill across disciplines, regardless of specialization. The study concludes that modern educational frameworks are increasingly integrating technology into curricula across the board, ensuring that students from all streams are exposed to and develop digital skills. It is also recommended for enhancing digital competence frameworks to better prepare female students for future challenges in a rapidly evolving digital landscape.

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