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THE IMPACT OF DIGITAL LITERACY ON TEACHING EFFECTIVENESS: A COMPARATIVE STUDY AMONG FACULTY IN GOVERNMENT, AIDED, AND PRIVATE COLLEGES

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Abstract *Digital literacy has become a cornerstone of teaching effectiveness in higher education, particularly as digital tools reshape pedagogical practices and student engagement. This article examines how faculty members' proficiency in digital tools influences their teaching methodologies and student interaction across government, aided, and private colleges affiliated with Mangalore University, Karnataka, India. This comparative study reveals significant disparities in digital competencies, with government faculty leading, followed by private and aided counterparts. Statistical analyses (t-tests, ANOVA) and qualitative insights highlight how these differences affect teaching practices and student outcomes, offering a basis for targeted interventions to enhance educational quality.*

Keywords: *Digital Literacy, Teaching Effectiveness, Higher Education, Faculty Proficiency, Teaching Methodologies, Student Engagement, Institutional Types, Information Literacy*

INTRODUCTION

The integration of digital technologies into higher education has elevated digital literacy to a critical competency for faculty members. Defined as the ability to locate, evaluate, utilize, and create information using digital platforms, digital literacy empowers educators to enhance teaching methodologies, foster interactive learning, and prepare students for a technology-driven world. This article investigates the impact of digital literacy on teaching effectiveness, comparing faculty in government, aided, and private colleges affiliated with Mangalore University.

The analysis is based on a comprehensive dataset examining digital literacy among 300 faculty members across 52 colleges in Dakshina Kannada, Udupi, and Kodagu districts. The central question is: How does faculty proficiency in digital tools influence teaching methodologies and student engagement across institutional types? The hypothesis posits that higher digital literacy correlates with innovative pedagogy and enhanced engagement, with variations driven by institutional resources, training, and employment stability.

THEORETICAL FRAMEWORK

Digital literacy aligns with information literacy theories, emphasizing its role in supporting lasting knowledge and critical thinking skills. The Association of College and Research Libraries (ACRL) standards frame this study, highlighting competencies such as efficient information access, critical evaluation, and ethical use. These skills underpin teaching effectiveness, enabling technology-mediated pedagogy.

Theoretically, digital literacy intersects with constructivist learning, where faculty facilitate knowledge construction through digital exploration, and Bandura's self-efficacy theory, suggesting that digitally confident educators adopt innovative practices. This framework supports the notion

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that digital literacy is fundamental to lifelong learning and effective teaching.

METHODOLOGY

The study employs a mixed-methods approach, sampling 300 faculty members from 52 colleges via Proportionate Stratified Random Sampling across government, aided, and private institutions. Data collection involved surveys on digital tool usage, teaching practices, and engagement, supplemented by interviews and observations. Quantitative analyses included t-tests (gender, rural-urban, permanent-temporary faculty) and ANOVA (institutional types, disciplines). Qualitative insights enriched the interpretation. Digital literacy is operationalized as proficiency in tools like OPACs, search engines, e-journals, and anti-plagiarism software, with teaching effectiveness measured via resource use, pedagogical innovation, and student interaction metrics.

DIGITAL LITERACY: SCOPE AND SIGNIFICANCE

Digital literacy encompasses skills such as internet navigation, OPAC usage, and advanced search techniques. Gaps exist in areas like plagiarism awareness and the use of Boolean operators. These skills enhance teaching by enabling access to diverse resources, multimedia integration, and ethical practices, such as copyright awareness, ultimately contributing to academic and pedagogical success.

COMPARATIVE ANALYSIS: DIGITAL LITERACY ACROSS INSTITUTIONAL TYPES

Government Colleges

Digital Literacy Proficiency: Government faculty exhibit the highest proficiency, reflecting strong digital skills. They frequently use textbooks, reference materials, OPACs, and e-journals, supported by robust training and library access.

Teaching Methodologies: High proficiency enables innovative pedagogy, integrating digital resources like e-journals and online materials. Frequent library use supports multimedia and research-based teaching, aligning with ACRL standards.

Student Engagement: Digital skills foster active learning, encouraging research and critical thinking. Students gain exposure to current data, supporting lifelong learning goals.

Table 1: Digital Tool Usage by Government Faculty

Tool	Percentage Usage
Textbooks	95.30%
Reference Materials	72.90%
OPACs	61.67%
E-Journals	68.53%

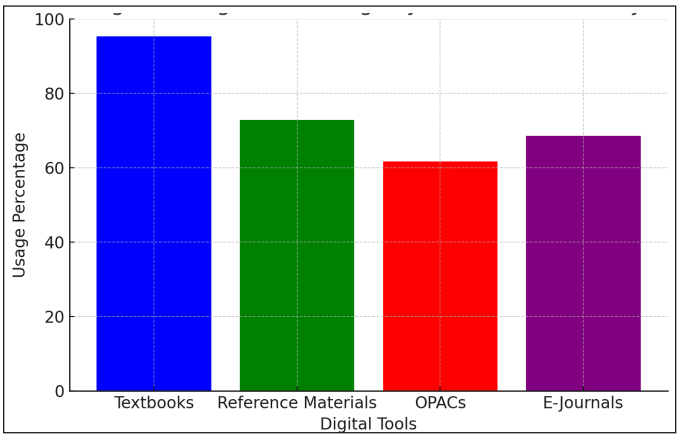

Fig. 1: Digital Tool Usage by Government Faculty

Aided Colleges

Digital Literacy Proficiency: Aided faculty demonstrate the lowest proficiency, with limited engagement in digital tools. They rely heavily on catalogues and print journals, with minimal advanced skill usage.

Teaching Methodologies: Lower skills restrict pedagogy to traditional methods, primarily using textbooks with little digital integration, reducing adaptability.

Student Engagement: Engagement suffers, with less exposure to e-resources limiting interactive learning, contrasting with the dynamic approach of government faculty.

Table 2: Digital Tool Usage by Aided Faculty

Tool	Percentage Usage
Textbooks	87.67%
Catalogues	42.70%
Journals	67.67%

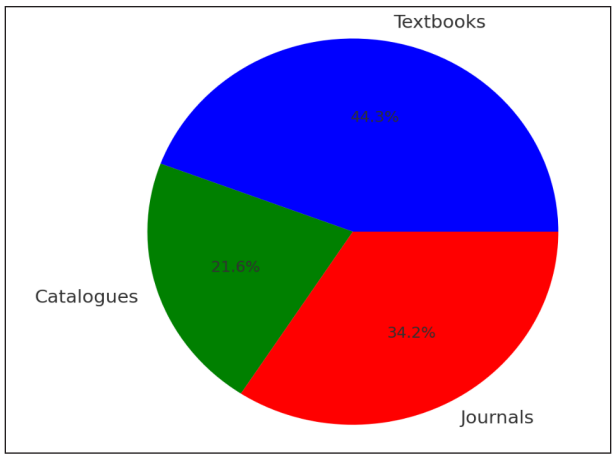

Fig. 2: Aided Faculty Resource Preference

Textbooks	87.67%

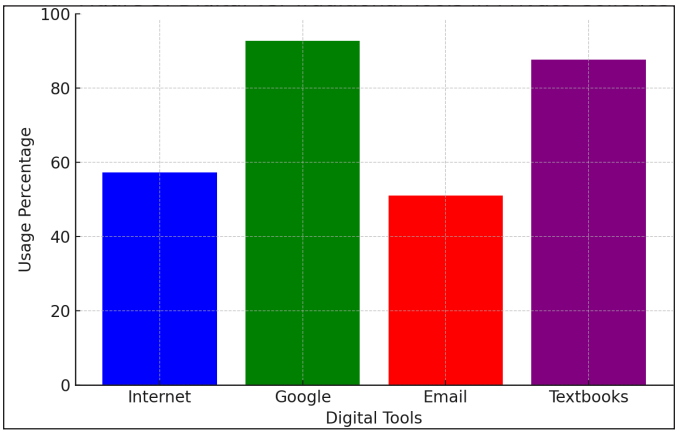

Fig. 3: Comparing Digital vs. Traditional Tools in Private Colleges

Private Colleges

Digital Literacy Proficiency: Private faculty show moderate proficiency, frequently using the internet, search engines, and email, though advanced tool knowledge remains limited.

Teaching Methodologies: A hybrid approach blends textbooks with digital resources, indicating moderate innovation.

Student Engagement: Engagement is fair, benefiting from digital tools but lacking consistency due to variable skills.

Table 3: Digital Tool Usage by Private Faculty

Tool	Percentage Usage
Internet	57.33%
Google	92.67%
Email	51%

Impact on Teaching Methodologies

Digital literacy enables pedagogical innovation. Government faculty integrate e-journals and multimedia, enhancing relevance and interaction. Aided faculty's reliance on static methods limits flexibility, while private faculty's hybrid approach shows potential. Training in advanced digital skills could enhance integration across all types.

Influence on Student Engagement

Engagement correlates with digital proficiency. Government faculty's high skills facilitate research tasks, boosting interaction. Aided faculty's lower proficiency limits engagement, while private faculty offer moderate benefits. Digital skills appear to enhance engagement universally across institutions.

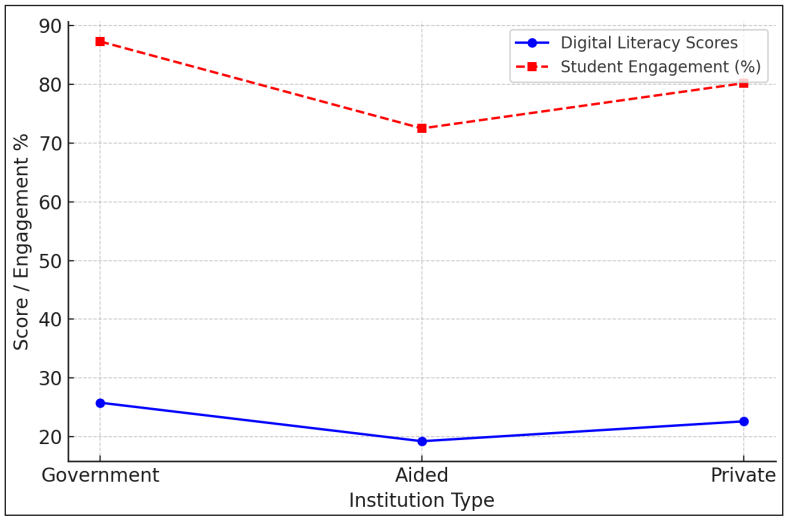

Fig. 4: Digital Literacy Scores vs. Engagement Metrics

Statistical Insights and Additional Variables

Institutional Differences: ANOVA confirms significant variation, with government faculty excelling due to resources and training.

Gender Disparities: Females score higher than males, possibly linked to greater engagement in training opportunities.

Table 4: Gender Comparison of Digital Literacy Scores

Gender	Mean Score	SD	N	t-Value	p-Value
Male	23.943	13.714	158	2.132	0.034
Female	27.2324	12.914	148		

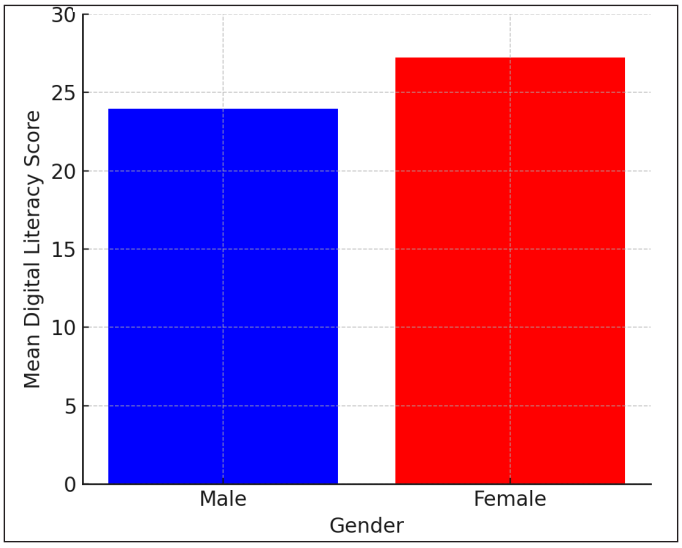

Fig. 5: Gender-Based Digital Literacy Scores

Rural vs. Urban: Rural faculty score lower than urban counterparts, reflecting access disparities.

Discipline Variations: Science faculty lead, followed by education, commerce, and arts, indicating discipline-specific demands.

Table 5: Discipline-Based Digital Literacy Scores

Discipline	Mean Score	SD	N
Arts	22.5333	13.635	165
Commerce	22.7191	12.29	89
Education	25.5	19.092	2
Science	32.2955	15.211	44

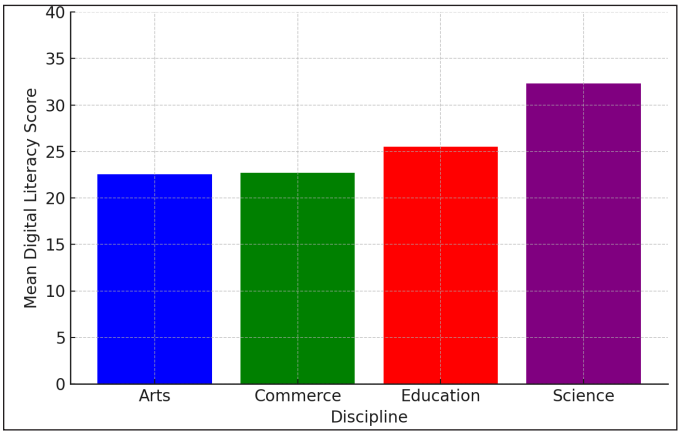

Fig. 6: Discipline-Based Scores

Legal and Ethical Dimensions

Digital literacy includes ethical skills. Awareness of plagiarism is limited, with varying use of anti-plagiarism tools across types. Government faculty excel in privacy and security knowledge, aided faculty lag, and private faculty show moderate awareness.

Table 6: Ethical Awareness Across Types

Issue	Government Mean	Aided Mean	Private Mean
Privacy/Security	8.073	5.4	8.43
Copyright	5.224	5.224	5.224

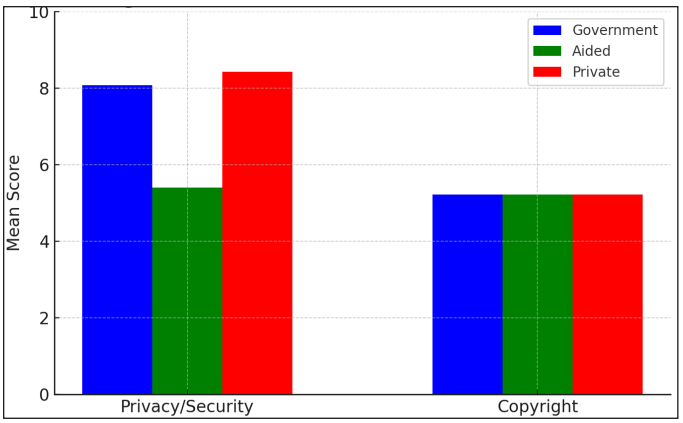

Fig. 7: Ethical Awareness by Type

DISCUSSION

Findings align with global studies. Ferguson et al. (2006) noted skill disparities, mirroring aided-private gaps. Government faculty's lead reflects effective resource utilization, while aided deficits highlight access barriers, consistent with Seneviratne (2004). Digital literacy enhances teaching flexibility and engagement, but training gaps hinder progress, especially in aided colleges.

Gender, rural-urban, and disciplinary variations add complexity. Females' higher scores suggest training receptivity, rural deficits indicate access issues, and science's lead reflects discipline demands. Ethical awareness underscores the need for integrity-focused training.

Recommendations: Based on the analysis:

- *Training Programs:* Workshops on tools, search techniques, and ethics, tailored by institutional type.
- *Infrastructure:* Upgrade Wi-Fi and terminals, prioritizing aided colleges.
- *Resources:* Curate digital lists and acquire e-journals.
- *Policy:* Incentives for training and stability in private colleges.
- *Discipline Focus:* Target arts and commerce gaps.
- *Ethical Training:* Mandatory plagiarism and copyright modules.

CONCLUSION

Digital literacy shapes teaching effectiveness, with government faculty leveraging high proficiency for innovative pedagogy and engagement, aided faculty lagging due to skill deficits, and private faculty showing moderate potential. Comprehensive training, supported by infrastructure and policy enhancements, is critical to bridge gaps. Future research could explore longitudinal effects or cross-regional trends, ensuring a digitally adept faculty in higher education.

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SURVEY QUESTIONNAIRE: FACULTY DIGITAL LITERACY AND TEACHING EFFECTIVENESS

Section 1: Demographic Information

Institutional Type:

- Government College
- Aided College
- Private College

Gender:

- Male
- Female
- Other
- Prefer not to say

Age Group:

- Below 30
- 30-40
- 41-50
- Above 50

Employment Status:

- Permanent
- Temporary/Contract

Academic Discipline:

- Arts
- Commerce
- Education
- Science
- Other (please specify): _____

Years of Teaching Experience:

- Less than 5 years
- 5-10 years
- 11-20 years
- More than 20 years

Location of Institution:

- Urban
- Rural

Section 2: Digital Literacy Proficiency

Please indicate your level of proficiency or frequency of use for the following digital tools and skills.

How often do you use the following digital tools for teaching or research purposes?

(1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

Tool	1	2	3	4	5
Internet (general)					
Search engines (e.g., Google)					
Library OPACs					
E-Journals/Databases					
Email for academic purposes					

How confident are you in using the following advanced digital skills?

(1 = Not Confident, 2 = Slightly Confident, 3 = Moderately Confident, 4 = Very Confident, 5 = Extremely Confident)

Skill	1	2	3	4	5
Boolean search operators					
Anti-plagiarism software (e.g., Turnitin, URKUND)					
Creating digital content (e.g., presentations, videos)					
Navigating copyright/plagiarism issues					

Have you received formal training in digital literacy or information literacy skills?

- Yes (please specify type and duration): _____
- No

How often do you visit the college library (physical or digital) to access resources?

- Never
- Once a month
- Once a week
- Twice a week
- Daily

Section 3: Teaching Methodologies

Please respond based on your current teaching practices.

Which of the following resources do you regularly use in your teaching? (Select all that apply)

- Textbooks
- Reference books
- E-Journals
- Government publications
- Online articles/websites
- Multimedia (e.g., videos, presentations)

- Other (please specify): _____

To what extent do you integrate digital tools into your teaching methodologies?

(1 = Not at All, 2 = Slightly, 3 = Moderately, 4 = Significantly, 5 = Extensively)

Statement	1	2	3	4	5
I use digital tools to deliver lectures.					
I assign tasks requiring online research.					
I incorporate multimedia in classes.					

How satisfied are you with the availability of digital resources (e.g., Wi-Fi, terminals, e-databases) at your institution?

- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

What is the primary barrier to integrating digital tools into your teaching?

- Lack of training
- Limited access to technology
- Time constraints
- Lack of interest
- Other (please specify): _____

Section 4: Student Engagement

Please reflect on how your use of digital tools influences your students.

How often do your students engage in the following activities as a result of your teaching methods?

(1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

Activity	1	2	3	4	5
Conduct online research					
Participate in digital discussions					
Use multimedia for assignments					

To what extent do you believe your digital literacy skills enhance student engagement?

- Not at All
- Slightly
- Moderately
- Significantly
- Extensively

How do students respond to your use of digital tools in teaching? (Select one)

- Very Uninterested
- Uninterested
- Neutral
- Interested
- Very Interested

Section 5: Open-Ended Questions

What specific digital tools or skills do you think would most improve your teaching effectiveness?

_____

_____

What additional support (e.g., training, infrastructure) would help you integrate digital tools into your teaching?

_____

_____

Section 6: Ethical and Legal Awareness

Are you familiar with the following ethical/legal concepts in digital contexts? (Select all that apply)

- Plagiarism
- Copyright laws
- Data privacy/security
- None of the above

Do you use any tools to check for plagiarism in student work?

- Yes (please specify): _____
- No