ICT Integration and E-resource Utilization: A Study of Teaching Faculty in First Grade Colleges Affiliated to the University of Mysore

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ABSTRACT

This research paper explores the awareness, utilization, and competency of information and communication technologies (ICT) among teaching faculty in first-grade colleges affiliated with the University of Mysore. The study investigates the extent of ICT tool adoption, e-resource utilization, and teaching professionals' attitudes toward these technologies. The survey-based research method involved 812 faculty members from 68 colleges across four districts. The study uncovered insights into the use of ICT tools and revealed that smartphones, laptops, and desktop computers were prominent computing tools. Internet, computers, and audio/video systems were commonly used, whereas interactive boards and projectors were less frequent. Assistant Professors demonstrated higher e-resource proficiency, suggesting recent technology exposure. The study underscores the need for training programs to enhance e-resource competency, especially for online databases and repositories.

KEYWORDS: ICT Competency, E-resources, ICT Devices, Attitude, Teachers.

INTRODUCTION

Academics need to be ready to offer their students learning opportunities supported by ICT in classrooms. Technology readiness and understanding how technology might help student learning must become essential competencies in every teacher's professional toolkit (Raja & Nagasubramani, 2019). The COVID-19 pandemic has created a platform for all teachers to use ICT to transfer knowledge and take up assessments of students using online tools (Paliwal & Singh, 2021). Virtual classrooms and electronic content management systems have evolved to support teaching and learning. Teachers need to be ready to give students access to technology's advantages during the learning process. The conventional teaching methods have not allowed students to look back to the taught content again and again due to time constraints. However, ICT-enabled classes can be re-visited by the students. Studying the ICT competency of teachers helps identify if they are aware of and proficient in using the latest technologies relevant to their subject areas (Lei, 2009). This information enables educational institutions to provide

ongoing professional development opportunities to keep teachers' skills current and relevant. Teachers who are proficient in technology and who can effectively teach the required subject matter while integrating technology, concepts, and skills are required for schools and classrooms, both physical and virtual.

Hence, a study to know the extent of the use of ICT and the level of ICT competencies in higher educational institutions make sense to understand the impact of this technology on higher education. Conducting a study on ICT competency helps identify teachers who may require additional support to bridge this divide. Institutions can then provide the necessary resources, infrastructure, and training to ensure equitable access to technology and equal opportunities for all teachers. Knowing the ICT competencies among the faculty members of first- grade colleges affiliated with the University of Mysore bring many inputs that help the parent University make policies to improve the ICT infrastructure and to initiate faculty training programs to enhance their capabilities in the use of ICT.

REVIEW OF LITERATURE

In education, integrating Information and Communication Technology (ICT) has emerged as a crucial factor in enhancing teaching and learning practices. A comprehensive review of existing literature sheds light on previous research contributions in this domain, highlighting gaps and challenges that warrant further investigation. Numerous scholars have undertaken studies to assess the ICT competencies and attitudes of educators. Danner and Pessu (2013) emphasized the importance of institutional provision of ICT infrastructure, highlighting that personal skills are equally crucial for effective ICT utilization. Padmavathi's (2016) research indicated that teachers acknowledged the importance of incorporating computers into teaching, with greater computer ownership leading to a positive perception. This study underscores the connection between computer access, usage, and increased confidence in ICT utilization. However, Amuche, Chris Igomu and Iyekekpolor's (2014) study centered on the ICT competence of teachers in Federal Unity Colleges (FUC) in Nigeria's North Central Geo-political zone. Their findings revealed that while teachers owned personal computers, their proficiency was limited to word processing, reflecting the practical need for examination-related tasks. However, a major barrier to effective ICT integration was inadequate internet access and self-perceived low competence. The study emphasized the challenges of funding ICT training, availability of facilities, and heavy workloads.

Tasir et al. (2012) studied Malaysian teachers and showcased the correlation between competency, confidence, and satisfaction with ICT programs. The findings underscored the significance of teachers' satisfaction in enhancing their competence and confidence. A similar study by Francisca (2012) explored the ICT competency of teacher trainees, revealing variations across disciplines and academic levels. The study highlighted the need for tailored interventions to enhance competency.

Ravat and Modi (2009) observed changes in computer skills and competencies among library science students, suggesting the need for tailored support for female students and acknowledging the positive growth in computer literacy within the field. Yusuf and Balogun (2011) examined Nigerian student-teachers competence and attitude towards ICT, emphasizing the importance of practical training and teacher educators as role models. Kareem and Olafare (2017) assessed lecturers' attitudes and proficiency in ICT, highlighting gender and experience-based differences, as well as the impact of higher degrees on attitudes. Another study by Johnson et al. (2006) identified a

decline in students' confidence in computer skills due to curriculum gaps, underscoring the importance of industry-aligned computer literacy skills. Similarly, Archibong et al. (2010) focused on academic staff in Nigerian universities, revealing challenges related to funding, access to facilities, and workload. The study highlighted the necessity of addressing these barriers for effective ICT integration.

In recent years, Nsouli and Vlachopoulos (2021) have studied the attitude of nursing faculty members towards technology and e-learning. The study was conducted in Lebanon and covered three categories of faculty viz., pioneers, followers, and resisters. The study found that pioneers have positive attitudes toward technology and e-learning whereas resisters have negative attitudes and followers have shown neutral attitudes. The study suggested incorporating the ICT in nursing curricula. A study by Esteve-Mon (2022) studied the digital teaching competence (DTC) of 558 teachers from a Spanish university. The study revealed that university teachers have an intermediate level of DTC and the DTA does not differ among the teachers with different academic positions. The study also highlighted that DTC was not unitary among the teachers. This study supported to development of practice and policies for teaching improvement through DTC

The literature review elucidates the evolving landscape of ICT competencies and attitudes among educators. While acknowledging the positive strides in recognizing ICT's importance, the studies collectively emphasize the need for targeted interventions, institutional support, curriculum revisions, and improved access to facilities and training programs. The findings underscore the critical role of educators' satisfaction, confidence, and practical experience in fostering effective ICT integration, ultimately shaping the future of education in a technologically driven world.

OBJECTIVES OF THE STUDY

The main objectives of the study are:

- ✓ To ascertain the awareness of ICT among the teaching faculty of first-grade college affiliated to the University of Mysore.
- ✓ To know the extent of use of ICT tools by the teaching faculty
- ✓ To find out the extent of use of e-resources and its application in the teaching and learning process
- ✓ To identify the level of ICT competency of teaching professionals.
- ✓ To find out the attitude and perception of teaching professionals towards the use of ICT and e-resources.

HYPOTHESES OF THE STUDY

For the present study, the following hypotheses have been formulated:

- ➢ The adequacy of ICT facilities in the college determines the level of competency in the use of e-resources
- ➢ The extent of professional experience is associated with the level of proficiency in the use of ICT-based activities
- ➢ There is no significant differences in attitude toward e-resources exist between the male and female teaching professionals

RESEARCH METHODOLOGY

The study employed the survey method to collect the primary data from the faculty members. The teaching faculties in undergraduate departments appended to 68 first-grade colleges affiliated with the University of Mysore were considered for the study. The study covered 68 colleges distributed over four districts viz., Hassan (28 colleges), Mysore (18 colleges), Mandya (15 colleges), and Chamarajnagar (7 colleges). A total of 1043 faculty members who were permanent by their nature of appointment have been working in these First Grade Colleges, and the researcher has decided to conduct the 'population study'. The structured questionnaire was designed and distributed to all 1043 faculty members, and in return, 812 filled questionnaires were received. This has made the response rate 77.85%. The received data were numerically coded and tabulated. The statistical software, i.e., SPSS 23.0, was used to test the hypotheses.

ANALYSIS AND INTERPRETATION OF DATA

Table-1: Distribution of the respondents by gender

Gender	Number	Percentage
Male	545	67.12
Female	267	32.88
Total	**812**	**100.00**

Table-1 indicates the gender-wise distribution of respondents. Of the 812 respondents, 545 are Male (67.12), and 267 are Female (32.88). The data shows that the male respondents are more in number.

Table-2: Designation-wise distribution of respondents

Designation	Number of respondents	Percentage
Principal	64	7.88
Associate Professor	81	9.98
Assistant Professor	667	82.14
Total	**812**	**100.00**

An attempt has been made to find out the designation-wise distribution of respondents. Table-2 indicates that of the 812 respondents, 667 are Assistant Professors accounting for 82.14% of the total followed by Associated Professors (9.98%), and Principals (7.88%). The table indicates that the majority of faculty members in colleges have the designation of Assistant Professors.

ICT tools can be used to enhance teaching and learning activities. A good number of colleges have been using ICT components and tools in colleges as depicted in table-7.

Table-3: Availability of ICT components and tools in colleges

ICT Components	No. of colleges	Percentage
Interactive Board	122	15.02
Overhead Projector	705	86.82

LCD Projector	132	16.26
Internet	753	92.73
Computer	812	100.00
Television	70	8.62
CD ROM	314	38.67
Printer	771	94.95
Scanner	679	83.62
Digital printer	42	5.17
Photocopy machine	455	56.03
Pen drive	610	75.12
Laptop	177	21.80
Kindle Reader	2	0.25
Flatter	2	0.25
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Flatter	2	0.25

Table-4: Awareness about ICT components and tools by respondents' designation

Designation	Awareness			
	Yes		No	
	Number	Percentage	Number	Percentage
Principal (N=64)	62	96.88	2	3.12
Associate Professor (N=81)	79	97.53	2	2.47
Assistant Professor (N=667)	664	99.55	3	0.45
Total (N=812)	**805**	**100.00**	**7**	**0.86**

Table-4 indicates that 96.88% of Principals, 97.53% of Associate Professors, and 99.55% of Assistant Professors are aware of ICT components. Arguably, the designation of the respondents does not influence the awareness level of ICT components.

Table-5: Designation-wise respondents' opinion on adequacy of ICT facilities in the college

Designation	Adequacy of ICT facilities			
	Yes		No	
	Number	Percentage	Number	Percentage
Principal (N=64)	48	75.00	16	25.00
Associate Professor (N=81)	68	83.95	13	20.31
Assistant Professor (N=667)	504	75.56	163	24.08
Total	**620**	**76.35**	**192**	**23.65**

In table-5, it is depicted that the most Associate professors (83.95%) opined that their college has adequate computers. Meanwhile, 75.56% of assistant professors and 75% of Principals have opined the same. Overall, 76.35% of the respondents stated that they have adequate computers in their colleges.

Table-6: ICT device personally owned to access e-resources

ICT Device	Number	Percentage
Desktop Computer	279	34.36
Laptop	404	49.75
Note Book	44	5.42
Smartphone	787	96.92
Other	1	0.12

Table-6 shows that the majority of faculty members personally own smartphones (96.925%) which is followed by laptops (49.75%), and desktop computers (34.36%). A meagre percentage of respondents own notebook computers (5.42%).

Table-7: The most convenient ICT device to access e-resources

ICT Device	Designation					
	Principal	Percentage	Associate Professor	Percentage	Assistant Professor	Percentage
Desktop Computer	16	25.00	6	7.41	109	16.34
Laptop	23	35.94	49	60.49	368	55.17
Note Book	2	3.13	1	1.23	2	0.30
Smartphone	23	35.94	25	30.86	188	28.19
Total	**64**	**100.00**	**81**	**100.00**	**667**	**100.00**

The majority of Principals (35.94%) opined that laptops and smartphones are the most convenient devices for accessing e-resources (table-7). Use of smartphones have become convenient due to its size and capacity to provide access to useful apps. Meanwhile, most associate professors (60.49%) and assistant professors (55.17%) opined that the laptop is the most convenient ICT device.

Table-8: Frequency of use of Internet to access e-resources by respondents with different designation

ICT Device	Principal (N=64)		Associate Professor (N=81)		Assistant Professor (N=667)	
	Number	Percentage	Number	Percentage	Number	Percentage
Daily	28	43.75	63	77.78	439	65.82
Weekly	13	20.31	5	6.17	109	16.34
Fortnightly	7	10.94	8	9.88	51	7.65
Monthly	4	6.25	2	2.47	17	2.55
Rarely	12	18.75	3	3.70	51	7.65
Total	**64**	**100.00**	**81**	**100.00**	**667**	**100.00**

Table-8 indicates the frequency of Internet use among respondents with different designations. The majority of Principals use the Internet daily (43.75%), followed by weekly (20.31%) and rarely (18.75%). At the same time, the majority of Associate Professors use the Internet daily (77.78%), followed by fortnightly (9.88%). Meanwhile, 65.82% of assistant professors use the Internet daily (65.82%), followed by weekly (16.34%). Comparatively, Associate Professors have depended on the Internet more than other designated faculty members.

Table-9: Frequency of using ICT applications

Purpose	Every day	Once in a week	Often	Rarely	Never	Mean
Interactive Boards	22 (2.71)	26 (3.20)	92 (11.33)	253 (31.16)	419 (51.60)	1.74
Overhead Projector	31 (3.82)	37 (4.56)	80 (9.85)	198 (24.38)	466 (57.39)	1.73
Multimedia Computer	60 (7.39)	44 (5.42)	100 (12.32)	176 (21.67)	432 (53.20)	1.92
Computer-Projector System	63 (7.76)	60 (7.39)	124 (15.27)	215 (26.48)	350 (43.10)	2.10
Internet/Web environment	393 (48.40)	133 (16.38)	129 (15.89)	94 (11.58)	63 (7.76)	3.86
Computers	325 (40.02)	210 (25.86)	151 (18.60)	74 (9.11)	52 (6.40)	3.84
Television	105 (12.93)	120 (14.78)	211 (25.99)	241 (29.68)	135 (16.63)	2.78
Radio	19 (2.34)	67 (8.25)	74 (9.11)	100 (12.32)	552 (67.98)	1.65

Video/ Audio system	348	147	96	103	118	3.62
	(42.86)	(18.10)	(11.82)	(12.68)	(14.53)	
Camera	168	220	257	73	94	3.36
	(20.69)	(27.09)	(31.65)	(8.99)	(11.58)	
Printer	134	218	210	186	64	3.21
	(16.50)	(26.85)	(25.86)	(22.91)	(7.88)	

ICT training improves the teaching quality of teachers, making it more interactive, engaging, and effective which assists them to keep up with the latest technological advancements. Table-9 indicates the frequency of use of ICT applications. It can be observed from the above data that the most frequently used ICT application is the internet/web environment, with 48.40% of respondents indicating they use it every day. This is followed by computers at 40.02% and video/audio systems at 42.86%, falling under the "everyday" category. Interactive boards and overhead projectors are the least frequently used ICT applications, with a mean score of 1.74 and 1.73, respectively. These two ICT applications are also the least commonly used in all categories, with over 30% of respondents reporting using them rarely. It is also noteworthy that using ICT applications, such as television and radio, varies widely depending on the frequency category.

Table-10: Level of competency in using e-resources

E-resource	More competent	Not so competent	Less competent	Incompetent	Mean
Online databases	313 (38.55)	263 (32.39)	101 (12.44)	135 (16.63)	2.93
Electronic journals (Full texts/Abstracts)	319 (39.29)	203 (25.00)	168 (20.69)	122 (15.02)	2.89
Electronic books	340 (41.87)	186 (22.91)	170 (20.94)	116 (14.29)	2.92
OPAC	320 (39.41)	185 (22.78)	171 (21.06)	136 (16.75)	2.85
E-thesis and Dissertations	300 (36.95)	216 (26.60)	168 (20.69)	128 (15.76)	2.85
Online reference books	275 (33.87)	229 (28.20)	144 (17.73)	164 (20.20)	2.76
E-newspapers	293 (36.08)	222 (27.34)	172 (21.18)	125 (15.39)	2.84
Institutional Repositories	160 (19.70)	254 (31.28)	115 (14.16)	283 (34.85)	2.36
Consortia (like UGC Shodh Sindhu etc.,)	133 (16.38)	275 (33.87)	131 (16.13)	273 (33.62)	2.33

4-More competent, 3-Not so competent, 2-Less competent, 1-Incompetent

The table-10 presents that the mean competency level of individuals in using e-resources varies from 1.90 to 2.93. The most competent e-resource is electronic books, with a mean competency level of 2.92, followed by electronic journals (2.89) and online databases (2.93). The least competent e-resource is online databases, with a mean competency level of 1.90, followed by consortia (2.33) and institutional repositories (2.36). The analysis shows that individuals are more competent in using electronic books, electronic journals, and online databases than other e-resources. However, there is still room for improvement in the overall competency level, as the mean scores are less than 3 for all e-resources.

Table-11: Level of competency in using e-resources by respondents' designation

E-resources	Mean value		
	Principal	**Associate Professor**	**Assistant Professor**
Online databases	2.52	2.35	3.30
Electronic journals (Full texts/Abstracts)	2.48	2.20	3.26
Electronic books	2.53	2.23	3.30
OPAC	2.41	2.20	3.22
E-thesis and Dissertations	2.42	2.23	3.21
Online reference books	2.33	2.19	3.11
E-newspapers	2.55	2.21	3.19
Institutional Repositories	2.11	2.04	2.62
Consortia (like UGC Shodh Sindhu etc.,)	1.98	1.96	2.61

4-More competent, 3-Not so competent, 2-Less competent, 1-Incompetent

Table-11 presents the level of competency in using e-resources by the designation of the respondents, which include Principals, Associate Professors, and Assistant Professors. Assistant Professors have the highest level of competency in using e-resources, followed by Principals and Associate Professors. Specifically, Assistant Professors have a mean score of 3.06, indicating they are more competent in using e-resources than the other two designations.

Furthermore, it is noteworthy that the level of competency varies across different types of e-resources. For instance, Assistant Professors are more competent in using online databases, electronic journals, electronic books, OPAC, E-thesis and Dissertations, online reference books, and e-newspapers than Principals and Associate Professors. In contrast, Principals and Associate Professors have relatively lower competency levels in using e-resources, with mean scores ranging from 2.19 to 2.55. However, they are still considered to be at least competent in using e-resources.

Table-12: Purpose of using e-resources

Purpose	More competent	Not so competent	Less competent	Incompetent	Mean
Developing materials for classes	146 (17.98)	303 (37.32)	103 (12.68)	260 (32.02)	2.41
Identification of researchable issues	187 (23.03)	298 (36.70)	127 (15.64)	200 (24.63)	2.58
Making presentation on contemporary issues	189 (23.28)	271 (33.37)	123 (15.15)	229 (28.20)	2.52
Amplifying the communication	186 (22.91)	264 (32.51)	146 (17.98)	216 (26.60)	2.52
Substantiating the views	135 (16.63)	282 (34.73)	105 (12.93)	290 (35.71)	2.32
Making critical evaluations	84 (10.34)	233 (28.69)	124 (15.27)	371 (45.69)	2.04
Making analytical approach of facts/phenomenon	68 (8.37)	235 (28.94)	92 (11.33)	417 (51.35)	1.94
Developing contemporary literatures or contributions to existing knowledge resources	59 (7.27)	195 (24.01)	69 (8.50)	489 (60.22)	1.78

4-More competent, 3-Not so competent, 2-Less competent, 1-Incompetent

Table-12 shows that identifying researchable issues (23.03) and making presentations on contemporary issues (23.28) are the essential purposes of applying content in e-resources, followed by amplifying communication (22.91) and substantiating views (16.63). On the other hand, making an analytical approach to facts/phenomena (8.37) and developing contemporary literature or contributions to existing knowledge resources (7.27) are considered less important.

The table also shows that individuals are more competent in identifying researchable issues (36.70) and presenting contemporary issues (33.37). At the same time, they need to be more competent in developing modern literature or contributions to existing knowledge resources (24.01) and making an analytical approach to facts/phenomena (28.94).

It can be observed that the mean level of competence in all the purposes mentioned in the table is less than 3, which indicates that individuals are not very competent in achieving these purposes using e-resources.

Table-13: Purpose of applying contents in e-resources cross-tabulated by respondents' designation

E-resources	Mean value		
	Principal	**Associate Professor**	**Assistant Professor**
Developing materials for classes	2.25	1.91	2.40
Identification of researchable issues	2.31	1.98	2.58
Making presentation on contemporary issues	2.19	1.98	2.52
Amplifying the communication	2.00	2.05	2.52
Substantiating the views	2.06	1.86	2.31
Making critical evaluations	1.88	1.72	2.01
Making analytical approach of facts/phenomenon	1.86	1.64	1.92
Developing contemporary literatures or contributions to existing knowledge resources	1.81	1.62	1.74

4-More competent, 3-Not so competent, 2-Less competent, 1-Incompetent

Table-13 shows that the level of competence of respondents in achieving the purposes of applying content in e-resources varies by their designation. Assistant professors are the most competent in all the purposes mentioned in the table, with a level of competence ranging from 1.92 to 2.58. Associate professors are relatively less skilled than assistant professors, with competence ranging from 1.62 to 2.05. Principals are the least competent in all the purposes mentioned in the table, with a group of competence ranging from 1.81 to 2.31.

Furthermore, the purpose of applying content in e-resources with the highest level of competence among all the respondents' designations is identifying researchable issues, with a level of competence ranging from 1.98 to 2.58. Making an analytical approach to facts/phenomenon has the lowest level of competence among all the respondents' designations, with a group of competence ranging from 1.64 to 1.92.

Table-14: Level of proficiency in ICT enabled activities

ICT enabled activities	Excellent	Good	Fair	Poor	Mean
Installation and customization of hardware and software	28 (3.45)	94 (11.58)	251 (30.91)	439 (54.06)	1.64
Use of Internet	403 (49.63)	208 (25.62)	126 (15.52)	75 (9.24)	3.16
Use of online library services	290 (35.71)	204 (25.12)	181 (22.29)	137 (16.87)	2.80
Downloading of articles in different file formats	240 (29.56)	186 (22.91)	214 (26.35)	172 (21.18)	2.61
Word processing skills (MS word etc.,)	227 (27.96)	247 (30.42)	232 (28.57)	106 (13.05)	2.73
Spreadsheet and Graphing skills (excel etc.,)	109 (13.42)	154 (18.97)	196 (24.14)	353 (43.47)	2.02

	121	232	244	215	
Telecommunication Skills (E-mails, messengers etc.,)	(14.90)	(28.57)	(30.05)	(26.48)	2.32
Use of advanced search with Boolean operators	36 (4.43)	94 (11.58)	177 (21.80)	505 (62.19)	1.58
Use of databases, e-books, e-journals etc.	59 (7.27)	159 (19.58)	229 (28.20)	365 (44.95)	1.89
Use of RSS (Really Simple Syndication) service	14 (1.72)	66 (8.13)	125 (15.39)	607 (74.75)	1.37
Ability to use alert service of databases	10 (1.23)	56 (6.90)	114 (14.04)	632 (77.83)	1.32
Use of 2 Asked Questions (FAQs) in websites	17 (2.09)	67 (8.25)	129 (15.89)	599 (73.77)	1.39
Ability to take part in discussion groups like Social Networks	37 (4.56)	112 (13.79)	88 (10.84)	575 (70.81)	1.52

4-Excellent, 3-Good, 2-Fair, 1-Poor

The table-14 presents the level of proficiency of respondents in various ICT-enabled activities. The highest level of proficiency is observed in Internet use, with almost half of the respondents (49.63%) indicating excellent proficiency in this area. This is followed by online library services, with 35.71% of respondents reporting excellent proficiency. Downloading articles accessible in various file formats and word processing skills such as MS Word are areas where a significant proportion of respondents (29.56% and 27.96%, respectively) report excellent proficiency.

However, the proficiency levels dropped significantly for other activities such as spreadsheet and graphing skills (13.42%), telecommunication skills (14.90%), and the use of advanced search with Boolean operators (4.43%). The lowest level of proficiency is reported in the use of RSS service (1.72%), the ability to use alert service offered by databases (1.23%), and the use of FAQs on websites (2.09%).

The data presented in table-27 show the level of proficiency in various ICT-enabled activities. The highest level of proficiency was seen in the use of the Internet, online library services, and word processing skills, with most respondents falling in the "Good" category. The lowest level of proficiency was seen in the use of advanced search with Boolean operators, RSS services, and participation in discussion groups/forums, with most respondents falling in the "Poor" category. Overall, the mean level of proficiency across all activities was "Fair".

Table-15: Factors encourage adopting ICT in academic and personal development by respondents' designation

	Mean value		
Factors	**Principal**	**Associate Professor**	**Assistant Professor**
Access to contemporary knowledge resources	2.66	2.67	2.66
Identifying the socio/economic/technical/scientific issues relevant to the society	2.69	2.46	2.52

Need for academic /professional progression	2.80	2.49	2.53
Impulsating factors like performance linked incentives, opportunities for vertical growth	2.80	2.46	2.66
Professional identity and social recognition	2.84	2.69	2.76
Rewards and recognition to the contributions made in the field of research	2.91	2.78	2.88
Development of scientific /technological communication infrastructure	2.83	2.84	2.88
Policy initiatives for empowerment of Faculties/Institutions	3.02	2.94	2.98
Opportunities for integrations (collaborations/MOU etc.,) with academic and industries creating opportunities to take up research on contemporary issues	3.02	3.07	3.04

4-More competent, 3-Not so competent, 2-Less competent, 1-Incompetent

Table-15 represents the factors encouraging the adoption of ICT in academic and personal development by the faculty members with different designations. Principals' responses emphasized the importance of policy initiatives for the empowerment of faculties and institutions, as well as opportunities for integration with academics and industries, creating opportunities to take up research on contemporary issues. These two factors received the highest mean scores of 3.02. A similar response was also given by Associate Professors and Assistant Professors who emphasized opportunities for integrations with academics and industries, creating opportunities to research contemporary issues that received a mean value of 3.07 from Associate Professors and 3.04 from Assistant Professors.

TESTING OF HYPOTHESES

Hypothesis-1: The adequacy of ICT facilities in the college determines the level of competency in the use of e-resources

Table-16: Testing of Hypothesis-1

ICT Facilities	X^2	P value
Online databases	204.926	.000
E- journals	239.704	.000
E-books	231.020	.000
OPAC	228.299	.000
E-theses & dissertations	201.946	.000
Online reference books	149.262	.000
E-newspapers	153.718	.000
Institutional Repositories	64.204	.000
Consortia	15.522	.001

The hypothesis-2 states that the adequacy of ICT facilities in the college determines the level of competency in the use of e-resources. To test this hypothesis, a chi-square test was performed on the data collected for different types of e-resources available in the college.

The magnitude of the chi-square value indicates that the association between databases, e-journals, e-books, OPAC, e-theses and dissertations, online reference books, and e-newspapers with the adequacy of ICT facilities is very strong, as the chi-square values for these types of e-resources are greater than 150. While, the association between consortia and institutional repositories with the adequacy of ICT facilities is moderate, as the chi-square values for these types of e-resources are less than 65. The obtained results indicate that all types of e-resources have a statistically significant association with the adequacy of ICT facilities at the college, as all p-values are less than the predetermined level of significance ($p < 0.05$). This means that hypothesis is accepted.

Hypothesis-2: The extent of professional experience is associated with the level of proficiency in the use of ICT based activities

Table-17: Testing of Hypothesis-4

ICT enabled activities	X^2	P value
Installation and customization of hardware and software	134.698	.003
Use of Internet	242.286	.000
Use of online library services	187.654	.000
Downloading of articles in various file formats	171.524	.000
Skills in MS-word processing	196.552	.000
Spreadsheet and Graphing skills (excel etc.,)	182.018	.000
Telecommunication Skills (E-mails, messengers etc.,)	148.019	.002
Advanced search (Boolean operators)	191.284	.000
Use of databases, e-books, e-journals etc., (Scholarly Content)	166.383	.000
Use of RSS (Really Simple Syndication) service	202.426	.000
Ability to use alert service offered by databases	178.537	.000
Use of 2 Asked Questions (FAQs) in websites	188.678	.000
Ability to participate in discussion groups/forums of interest on internet (Social Networks)	180.667	.000

The data were analyzed using a chi-square test at a probability value of 0.05. The results indicate that there is a significant association exists between the extent of professional experience and the level of proficiency in the use of various ICT activities. The variables with the highest chi-square values and significant p-values are the use of the internet, use of online library services, downloading of articles in different file formats, word processing skills, spreadsheet and graphing skills, use of advanced search with Boolean operators, use of databases, e-books, e-journals, use of RSS service, and ability to use alert service offered by databases. These findings suggest that

respondents with more professional experience are more likely to have higher levels of proficiency in these areas. Therefore, the hypothesis is accepted.

Hypothesis-3: There is a significant difference in attitude towards e-resources exist between the male and female teaching professionals

Table-19: Testing of Hypothesis-3

Attitude towards e-resource	F	Sig.
Utilizing e-resources is complex and time consuming	(F=1.054,	p=.305)
Enhanced computer skills improve my usage of e-resources	(F=2.564,	p=.110)
ICT improves using e-resources and enhancing quality of my research productivity	(F=1.558,	p=.212)
Enhanced skills in application of e-resources can obviously improve its level of utilization	(F=.039,	p=.843)
Application of ICT/e-resources would drive the faculty towards enhancing quality of teaching and research	(F=.112,	p=.737)
The complex process of utilizing e-resources most of the times deters me to utilize the same most effectively	(F=.396,	p=.529)

The results of the one-way ANOVA tests indicate that there is no significant difference in attitudes towards e-resources between male and female teaching professionals. Specifically, none of the statements showed a statistically significant difference in mean scores between male and female respondents at the probability level of 0.05. Based on these results, the hypothesis that there is no significant difference in attitude towards e-resources between male and female teaching professionals is rejected.

DISCUSSION AND CONCLUSION

The survey pinpointed several crucial areas that need improvement to boost faculty members' ICT proficiency and increase their use of online resources. The adequacy of computers in colleges is a criterion to be considered for imparting quality education using information and communication technologies. Interestingly, it is found that the Smartphone has become the need of the hour, whereas laptop and desktop computers serve the faculty members as the major computing devices. The frequency of use of ICT applications varies widely depending on the type of application. Internet/web environments, computers, and video/audio systems are the most frequently used, while interactive boards and overhead projectors are the least frequently used. Among the three categories of respondents, Principals use the Internet rarely, which indicates the load of administrative responsibilities that may give them less time to use the Internet to access e-resources.

The study witnessed a need for training and education programs to improve the competency level of individuals in using various e-resources, particularly for online databases, institutional repositories, and consortia. The Assistant Professors are more proficient in using e-resources than other designations. This may be due to their recent technology exposure and familiarity with using e-resources in their academic work. On the other hand, Principals and Associate Professors may require further training and support to enhance their competency in using e-resources.

The study highlighted the importance of e-resources to attain various goals, such as identifying researchable issues, making presentations on contemporary topics, amplifying communication, and substantiating views. The study also focused on how respondents' competence level in applying content in e-resources varies by designation. It is found that Assistant professors are the most competent, followed by associate professors and principals. Identifying researchable issues has the highest level of competence among all the respondents' designations, while making an analytical approach to facts/phenomenon has the lowest level of competence.

The teaching faculty have some proficiency in these activities, and there is room for improvement and further skill development. Overall, individuals have varying proficiency levels in ICT-enabled activities. This may reflect differences in exposure, experience, and training. Empowering faculties and institutions through policy initiatives and promoting collaborations with academic and industry partners can help to create an environment that supports and motivates researchers to pursue important research questions.

Collaboration with libraries and librarians can also support specialized instruction on correctly accessing and utilizing online resources. The college administration is crucial in allocating enough funds to install and keep ICT infrastructure. Encourage the faculty members to use ICT components and e-resources. It is crucial to guarantee the availability of modern computers, printers, scanners, and internet connectivity. The study highlighted the requirement for a mentoring program and a welcoming environment where seasoned professors may lead and assist their peers. An atmosphere supportive of ICT integration can be created by establishing a culture of ongoing learning and self-improvement and regular seminars and workshops on cutting-edge ICT trends.

Additionally, working with government programs and organizations might open up prospects for funding and grants that are specially designed to improve ICT skills. Institutions should actively seek out these partnerships to enhance faculty members' development of ICT skills. The study also emphasized the value of including ICT-related courses or modules in the curriculum. Faculty members will have the skills to effectively use e-resources in their teaching, research, and administrative tasks if they get a formal education on ICT competencies throughout their academic careers. To sum up, universities can increase ICT competence and encourage faculty members to use e-resources effectively by implementing the suggested enhancements. This will result in better instructional strategies, more productive research, and more effective administration. Fostering a conducive atmosphere that welcomes and includes ongoing evaluation and feedback mechanisms will ensure the sustainability and success of ICT integration in academic institutions.

Based on the study's major findings, the following suggestions can be incorporated to enhance the ICT competencies among the faculty members.

- A comprehensive ICT training program for faculty members by a dedicated team of ICT trainers covering basic computer skills, internet usage, and advanced software applications through library orientation and workshops is required.

- Collaborating with libraries and librarians are essential to offer specialized training on accessing and utilizing e-resources effectively. A consortium, databases, and open-access e-resources will be taught to the faculty members through the library activities.

- The state government needs to allocate sufficient resources for the procurement and maintenance of up-to-date ICT infrastructure, including computers, printers, scanners, and Internet connectivity.

- The use of the N-List consortium shall be promoted among the faculty members. However, it is essential to develop a centralized online platform or portal that provides easy access to a wide range of e-resources, including electronic books, journals, and databases, in line with the VTU consortium.

- It is needed to encourage faculty members to actively participate in professional development programs (FDPs) and conferences focused on ICT integration and e-resource utilization.

- The libraries need to implement a reward and recognition mechanism for faculty members who demonstrate exceptional utilization of e-resources in their teaching, research, and administrative activities. The awards for highest consortium usage, the highest number of times logged into the library website and best usage of OPAC/Web OPAC shall be given to the faculty members to encourage the maximized use of ICT devices and e-resources.

- Training and Education programs are needed to improve individuals' competency levels using various e-resources, particularly for online databases, institutional repositories, and consortia. These programs can cater to different individuals' needs based on their current competency level.

- On the other hand, Principals and Associate Professors may require further training and support to enhance their competency in using e-resources.

- Most faculty members have recognized the importance of training and orientation programs in developing ICT skills. Hence, college libraries should conduct training programs about the use of ICT devices. Respondents may require more awareness about the benefits of training programs for developing ICT skills.

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