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Impact of Information Communication Technology on Library Resources and Services in Engineering College Libraries in Telangana State

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ABSTRACT

The present study examines the impact of Information and Communication Technology (ICT) on Library Resources and Services in engineering college libraries in Telangana State. The study adopted a survey method and collected data from 80 respondents from five selected engineering colleges in Hyderabad. The findings reveal that computer systems in the library were the most widely used ICT resource (71.7%), while e-resources are the highest level of user satisfaction. A significant majority of respondents (98.8%) reported that ICT-based services save time in accessing information and (78.8%) agreed that ICT improves the quality of learning and research. The study also explores that ICT has a positive impact on library services, particularly in information access, research productivity, teaching, and learning, while remote access and digital library services require further improvement.

Keywords: Information and Communication Technology (ICT), Engineering College Libraries, Library Resources, Library Services, E-Resources, Digital Library, ICT Impact.

INTRODUCTION

Information and Communication Technology (ICT) has become an important component of modern library services, facilitating faster access to information, improving the availability of digital resources, and supporting users in their academic and research activities. The effectiveness and perceived impact of ICT-based library services may vary according to the professional experience of the respondents, as individuals with different levels of experience may differ in their familiarity with technology, patterns of information use, and expectations from library services. The present study, ICT Impact Score was used to assess respondents' perceptions regarding the impact of ICT-based library services.

REVIEW OF RELATED LITERATURE

Kumar & Kumar (2026) the study entitled that “*An assessment of library automation and ICT-based services in college libraries affiliated to Kuvempu University, India*” found that college libraries have adopted automation software and ICT-based services. The study recommended that ICT plays a vital role in improving library services but the extent of adoption varies across institutions. **Wilson & Ofori (2026)** the study entitled that “*Role of Information and Communication Technology in Transforming Academic Libraries*”, the authors argue that ICT has shifted libraries from print-centric collections to integrated

digital environments supporting e-learning, remote access, and interdisciplinary services. The study recommends integrating ICT with teaching and research, and recruiting digitally-literate library professionals. **Pagore (2024)** the study entitled that “*Impact of ICT on academic libraries: Challenges for library professionals.*” found that ICT integration improves library management processes such as cataloguing, circulation, and stock verification, while also enabling communication services like e-mail, online databases, and digital information services. **Patel & Fernandes (2024)** the study entitled that “*Revolutionizing Library Services: The Impact of Information and Communication Technology*” ICT has turned traditional libraries into technology-rich spaces with e-resources, IoT, and AI-based tools. **Tallolli & Mulla (2023)** study “*Impact of Information and Communication Technology on College Libraries Technical and Reference Services*” ICT has improved cataloguing accuracy, circulation speed, and reference services through online systems and digital tools. The colleges struggle with outdated software, weak connectivity, and low staff competence. **Singh & Kumar (2021)** the study “*Use of Emerging Technologies in the University Libraries: A Study of Global Trends*” advanced libraries adopt RFID, cloud computing, AI-based discovery, and research-data-management systems. These tools improve circulation, user experience, and research support. **Hassan (2020)** The research entitled that “*Global Technological Trend in Academic Libraries*” suggests affordable ICT models, library systems regionally networked, and international cooperation for filling this gap. It is worth noting that leading academic libraries across the world today serve as digital nodes providing 24×7 access, institutional repository systems, and mobile applications. **Khan (2016)** study “*Impact of information communication technology on library and its services.*” impact of ICT on library services and concluded that ICT enhances information retrieval, improves efficiency, and enables libraries to provide faster and cost-effective services to users.

METHODOLOGY:

Survey method was adopted for the study A Total of 100 Questionnaires were distributed to the B. Tech and M. Tech students in selected (5) engineering colleges in Hyderabad. So fully filled 80 questionnaires were considered for the Study.

LIMITATIONS:

The current study confines to 5 engineering college Libraries in Hyderabad, Telangana State. A total of 100 questionnaires were distributed to the respondents. 80 respondent's questionnaires considered for the study. The study focuses on impact of usage of ICT to use Library Resources and Services.

OBJECTIVES:

- 1.To find out the usage of ICT based Library services in Engineering College Libraries
- 2.To find out what purpose ICT resources are using in Engineering college Libraries
- 3.To find out the impact of ICT resources in Engineering college Libraries

RESEARCH QUESTIONS:

Considering the objectives, efforts have been made to solve the research problems stated below:

1. To what extent are the ICT-based Library services used in Engineering College Libraries of Hyderabad?
2. For what purpose are the globalized ICT resources used in Engineering College Libraries?
3. To what extent has ICT affected Learning, Teaching and Research in Engineering College Libraries?

ANALYSIS OF DATA:

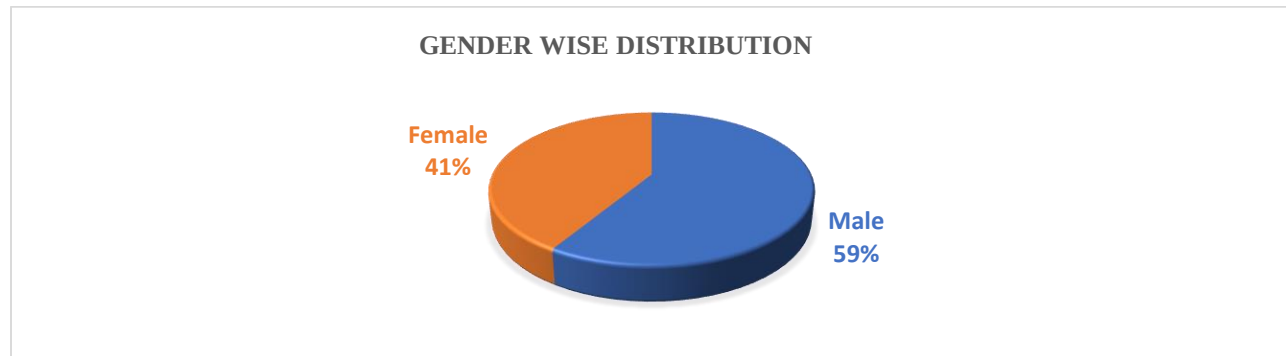
Gender wise Distribution of Respondents

Distribution of respondent's gender-wise the total number of respondents was 80, out of which 47 (58.8%) were male and 33 (41.3%) were female. Thus, male respondents constituted the majority of the sample, while female respondents accounted for a comparatively smaller proportion.

Table 1: Gender wise Distribution of Respondents

Sl. No	Gender	Frequency	Percent
1	Male	47	58.8
2	Female	33	41.3
	Total	80	100.0

Figure 1: Gender wise Distribution of Respondents



Age Group wise Distribution of Respondents

Analysis of the age-wise distribution of the respondents shows that among the total number of 80 respondents, 24 (30.0%) were under 20 years of age, 38 (47.5%) were between 21 and 30 years, and 18 (22.5%) were between 31 and 40 years. Hence, the largest number of the respondents were of 21–30 years of age (47.5%), followed by 20 years and below (30.0%), whereas the least number was from the 31–40 years of age group (22.5%).

Table 2: Age Group wise Distribution of Respondents

Age Group	Frequency	Percent
Below 20 Years	24	30.0
21-30 Years	38	47.5
31-40 Years	18	22.5
Total	80	100.0

Educational Qualification wise Distribution of Respondents

An analysis of the age-wise pattern of the respondents reveals that out of a total of 80 respondents, 24 (30.0%) belonged to the age group less than 20 years, 38 (47.5%) belonged to the age group 21-30 years, and 18 (22.5%) belonged to the age group 31-40 years. Thus, the maximum number of respondents belong to the age group of 21-30 years (47.5%), followed by the age group of less than 20 years (30.0%), while the minimum belongs to the age group 31-40 years (22.5)

Table 3: Educational Qualification wise Distribution of Respondents

Sl. No	Qualification	Frequency	Percent
1	UG	55	68.8
2	PG	25	31.3
3	Total	80	100.0

Experience wise distribution of Respondents: The total 80 respondents, out of the total number of respondents, 58 (72.5%) had less than one year of experience and 22 (27.5%) had 2 to 5 years of experience. It is clearly visible from the above information that most of the respondents had very little experience, as more than three-fourths of the respondents had experience of less than a year.

Table 4: Experience wise distribution of Respondents

Sl. No	Experience	Frequency	Percent
1	Below 1 Year	58	72.5
2	2-5 Years	22	27.5
3	Total	80	100.0

Frequency of Library Visit:

The frequency-wise distribution of respondents, library visits indicates that out of the total 80 respondents, 53 (66.3%) visited the library daily, 9 (11.3%) visited weekly, and 18 (22.5%) visited occasionally. Thus, the majority of the respondents were regular daily visitors to the library, while a smaller proportion visited weekly or occasionally. Overall, the findings indicate that library usage was relatively high among the respondents, with nearly two-thirds reporting daily visits.

Table 5: Frequency of Library Visit

Sl. No	Frequency of Library Visit	Frequency	Percent
1	Daily	53	66.3
2	Weekly	9	11.3
3	Occasionally	18	22.5
4	Total	80	100.0

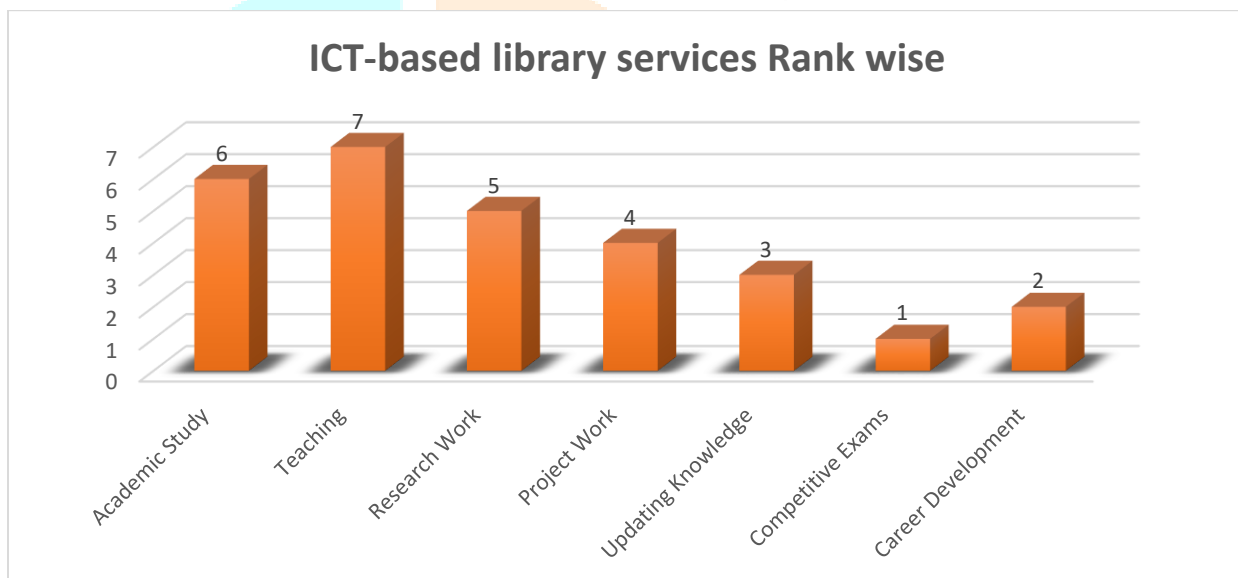
ICT-based library services Rank wise:

ICT-based library services are used by the respondents for a variety of purposes. Competitive Examinations Ranked First, with 80 respondents (100%), followed by Career Development, with 80 respondents (100%), and Updating Knowledge, with 80 respondents (100%), securing second and third ranks respectively. Project Work was also reported by 80 respondents (100%) and obtained fourth rank. Research Work was reported by 64 respondents (80%) and ranked fifth, while Academic Study was reported by 80 respondents (80% as given in the table) and ranked sixth. Teaching was reported by 43 respondents (53.75%), receiving the seventh rank. Overall, the findings indicate that respondents primarily use ICT-based library services for competitive examinations, career development, updating knowledge, and project work, while teaching purpose library resources received the lowest rank.

Table 6: ICT-based library services Rank wise

Sl. No	Purpose	No of respondents	Percentage	Rank
1	Academic Study	80	80	6
2	Teaching	43	53.75	7
3	Research Work	64	80	5
4	Project Work	80	100	4
5	Updating Knowledge	80	100	3
6	Competitive Exams	80	100	1
7	Career Development	80	100	2

Figure 3: ICT-based library services Rank wise



ICT-based Library Resources:

The findings on access to ICT-based library resources show that Library Computer Systems were the most commonly used mode, reported by 57 respondents (71.7%). This was followed by Personal Internet/Data Connection with 42 respondents (52.5%), Mobile Phone/Smartphone with 39 respondents (48.8%), and College Wi-Fi Network with 36 respondents (45.0%). Personal Laptop was used by 35 respondents (43.8%), while Department Computer Lab was used by 29 respondents (36.3%) and Tablet/iPad by 25 respondents (31.3%). A smaller proportion accessed resources through the Digital Library Portal (12 respondents, 12.0%) and Remote Access from Home (7 respondents, 8.8%). The respondents predominantly accessed ICT-based library resources through library computers and personal internet-enabled devices, whereas remote access and direct use of the digital library portal were comparatively less common.

Table 7: ICT-based Library Resources

Sl. No	ICT-based Library Resources	Frequency	Percentage
1	Library Computer Systems	57	71.7
2	Personal Laptop	35	43.8
3	Mobile Phone /Smartphone	39	48.8
4	Tablet / iPad	25	31.3
5	Remote Access from Home	7	8.8
6	Department Computer Lab	29	36.3
7	College Wi-Fi Network	36	45
8	Personal Internet/Data Connection	42	52.5
9	Digital Library Portal	12	12

Level of Satisfaction with ICT-based Library Services:

The level of satisfaction with ICT-based library services indicates that E-Resources received the highest level of satisfaction, with 44 respondents (55.0%) highly satisfied and 24 (30.0%) satisfied, while only 2 (2.5%) were dissatisfied. For Internet Facility, 7 respondents (8.8%) were highly satisfied and 34 (42.5%) satisfied, whereas 36 (45.0%) were neutral. Regarding OPAC Service, 16 (20.0%) were highly satisfied and 21 (26.3%) satisfied, while 35 (43.8%) remained neutral and 8 (10.0%) were dissatisfied. Digital Library services recorded 16 (20.0%) highly satisfied and 29 (36.3%) satisfied respondents, with 29 (36.3%) neutral and 6 (7.5%) dissatisfied. For User Assistance, 26 (32.5%) were highly satisfied and 11 (13.8%) satisfied, while 32 (40.0%) were neutral and 11 (13.8%) dissatisfied. Similarly, Online Services had 16 (20.0%) highly satisfied and 21 (26.3%) satisfied respondents, while 36 (45.0%) were neutral and 7 (8.8%) dissatisfied. Overall, E-Resources emerged as the most satisfactory ICT-based library service, whereas Internet Facility, OPAC, and Online Services showed comparatively higher levels of neutrality, indicating scope for further improvement.

Table 8: level of Satisfaction with ICT-based Library Services

Services	Highly Satisfied		Satisfied		Neutral		Dissatisfied	
	Freq	%	Freq	%	Freq	%	Freq	%
E-Resources	44	55	24	30	10	12.5	2	2.5
Internet Facility	7	8.8	34	42.5	36	45	3	3.8
OPAC Service	16	20	21	26.3	35	43.8	8	10
Digital Library	16	20	29	36.3	29	36.3	6	7.5
User Assistance	26	32.5	11	13.8	32	40	11	13.8
Online Services	16	20	21	26.3	36	45	7	8.8

ICT-based Library Services: ICT-based library services have proved very successful in saving the time of respondents when accessing information. In a total of 80 respondents, 40 (50.0%) strongly agree and 39 (48.8%) agreed that ICT-based library services save their time in accessing information, while 1 respondent (1.3%) was neutral. None of the respondents disagreed with the statement. It is clearly indicated that 98.8% of the respondents had a positive opinion, that ICT-based library services significantly contribute to faster and more efficient access to information.

Table 9: ICT-based Library Services save your time in Accessing Information

	Frequency	Percent
Strongly Agree	40	50.0
Agree	39	48.8
Neutral	1	1.3
Total	80	100.0

The impact of ICT-based library services is highly effective regarding the quality of education and research among the respondents. In total, out of the 80 respondents, 33 (41.3%) respondents strongly agreed and 30 (37.5%) respondents agreed that the ICT-based library services positively contribute to the quality of learning and research, whereas 17 (21.3%) respondents were neutral regarding the issue. 78.8% of respondents gave positive responses that the ICT-based library services positively affect the quality of learning and research.

Table 10: ICT-based Library Services improve the quality of learning and research

	Frequency	Percent
Strongly Agree	33	41.3
Agree	30	37.5
Neutral	17	21.3
Total	80	100.0

Impact of ICT on Quality of Library Services:

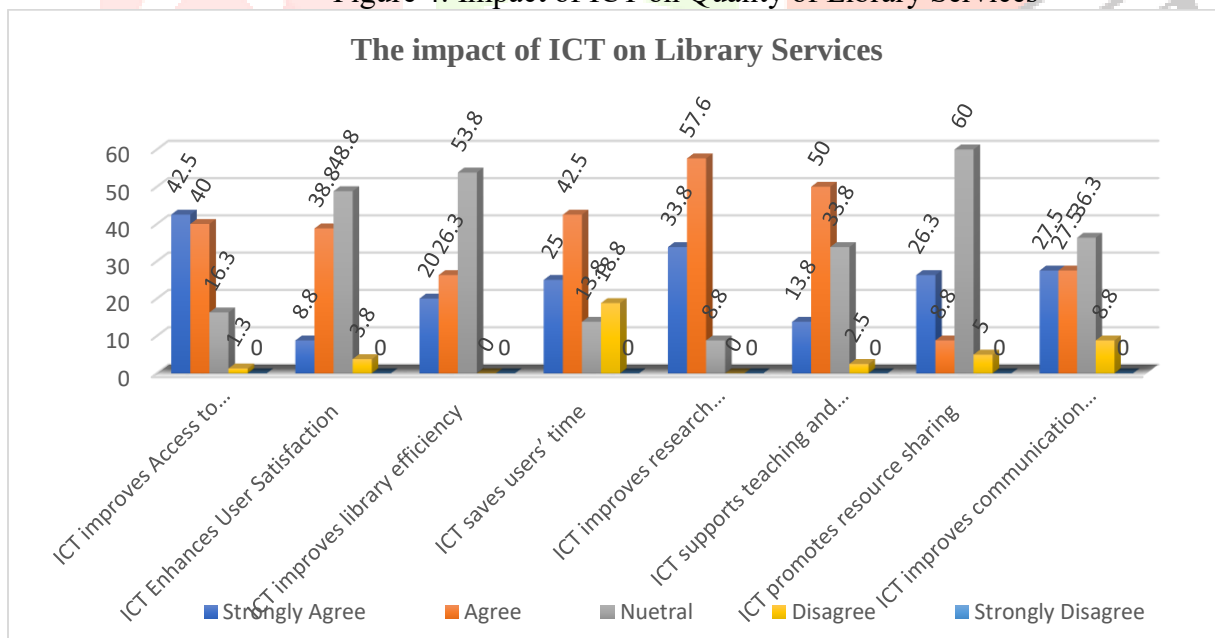
The impact of ICT on Library Services. With Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree as shown below

Results concerning the influence of ICT on the quality of library services show a generally positive attitude by the respondents. As for access to information resources, 82.5% of the respondents agree either strongly (42.5%) or agree (40.0%) that ICT facilitates access. Similarly, 47.6% agreed or strongly agreed that ICT enhances user satisfaction, although 48.8% remained neutral. For library efficiency, 46.3% expressed agreement or strong agreement, while 53.8% were neutral. Regarding time saving, 67.5% agreed or strongly agreed that ICT saves users' time, although 18.8% disagreed. The strongest positive response was observed for research productivity, where 91.4% strongly agreed or agreed that ICT improves research productivity. ICT also supports teaching and learning, with 63.8% expressing agreement or strong agreement. However, resource sharing received a comparatively neutral response, with 60.0% remaining neutral and 35.1% expressing agreement or strong agreement. Similarly, 55.0% agreed or strongly agreed that ICT improves communication between the library and users, while 36.3% remained neutral. Overall, the findings demonstrate that respondents generally perceive ICT as beneficial for improving access to information, research productivity, teaching and learning, and saving users' time, although areas such as user satisfaction, library efficiency, resource sharing, and communication have considerable neutral responses, suggested scope for further improvement.

Table 11: Impact of ICT on Quality of Library Services

Sl. No	Statements	SA		A		N		DA		SDA	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
1	ICT improves Access to Information Resources	34	42.5	32	40	13	16.3	1	1.3	0	0
2	ICT Enhances User Satisfaction	7	8.8	31	38.8	39	48.8	3	3.8	0	0
3	ICT improves library efficiency	16	20	21	26.3	43	53.8	0	0	0	0
4	ICT saves users' time	20	25	34	42.5	11	13.8	15	18.8	0	0
5	ICT improves research productivity	27	33.8	46	57.6	7	8.8	0	0	0	0
6	ICT supports teaching and learning	11	13.8	40	50	27	33.8	2	2.5	0	0
7	ICT promotes resource sharing	21	26.3	7	8.8	48	60	4	5	0	0
8	ICT improves communication between library and users	22	27.5	22	27.5	29	36.3	7	8.8	0	0

Figure 4: Impact of ICT on Quality of Library Services



Findings of the study

The study found that ICT-based library services are widely used by respondents, particularly for teaching, academic study, and research activities. Computer systems in the library were the most commonly used ICT resource, while e-resources received the highest level of user satisfaction. A large majority of respondents reported that ICT saves time in accessing information and improves the quality of learning and research. ICT was also found to have a strong positive impact on information access, research productivity, teaching and learning. However, remote access, digital library portals, resource sharing, and some online services require further improvement. The study also found that there was no significant difference in the perceived impact of ICT based on respondents' years of experience.

Results and Discussion

The study results show that ICT has a positive impact on engineering college library resources and services, particularly in saving users' time, improving information access, learning, and research productivity. E-resources were the most satisfactory ICT-based service, while remote access, digital library portals, and resource sharing require further improvement. The study indicate that ICT has become an important support for teaching, academic study, and research activities. However, better infrastructure, user awareness, technical support, and remote-access facilities are needed to strengthen ICT-based services.

Conclusion

The study concludes that ICT has significantly improved library services in engineering colleges in Telangana State. ICT enables faster, easier, and more efficient access to information resources. Most users reported that ICT saves time and supports learning and research activities. E-resources were found to be the most satisfactory ICT-based library service. ICT also contributes positively to research productivity and academic work. However, remote access and Digital Library Portals are still underutilized. Some limitations were observed in OPAC, internet connectivity, and resource-sharing services. ICT benefits are recognized across different categories of users. Libraries should improve infrastructure, connectivity, remote access, and user awareness. ICT is essential for providing effective and modern library services.

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