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RESEARCH ARTICLE

AN ANALYTICAL STUDY OF LIBRARY INFRASTRUCTURE, ICT FACILITIES, AND PHYSICAL RESOURCES IN DEGREE COLLEGE LIBRARIES AFFILIATED TO KUVEMPU UNIVERSITY OF KARNATAKA

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Academic libraries; Library infrastructure; ICT facilities; Physical resources; Library buildings; Degree colleges; Higher Education in Karnataka; Library furniture adequacy; Access systems; Library automation; Library staffing; Educational system; Library resource analysis.

Abstract

Libraries in higher education institutions serve as foundational centres for academic and intellectual development. This study examines the library infrastructure, educational system of colleges, physical and ICT facilities, staff distribution, and furniture adequacy across 60 degree college libraries affiliated to Kuvempu University in Karnataka. Using quantitative data from multiple institutional categories (government, aided, unaided, and constituent colleges), the study explores disparities in resources, access systems, and technological adoption. Results indicate that while basic services are available in most colleges, significant gaps exist in advanced ICT facilities, physical infrastructure, and user-centred amenities. The findings highlight the need for policy intervention and systematic development of college libraries.

Introduction:-

Academic libraries have evolved in function—from traditional repositories of books to dynamic knowledge centres equipped with digital and physical learning resources. In Karnataka, degree colleges represent a major segment of higher education, yet variations in infrastructure and technology raise concerns about equitable access to learning resources. This study aims to assess library buildings, staff, courses, ICT facilities, furniture adequacy, and physical amenities across various types of colleges.

Review of Literature:-

Budd (2018) emphasised that academic library development depends on institutional funding, staff competency, and ICT adoption.Somashekara&Minaxi (2020) found wide differences in infrastructure between rural and urban college libraries in Karnataka.Kulkarni (2017) highlighted the importance of independent library buildings and adequate reading spaces for user comfort.Ramesh & Joseph (2019) reported that ICT tools such as OPAC, scanners, and printers significantly improve library service efficiency.Haneefa (2021) noted barriers in Indian college libraries, including insufficient ICT infrastructure and outdated furniture.Sharma (2016) found that most academic libraries struggle with physical facilities, such as restrooms, drinking water, and ventilation.

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Objectives of the Study:

1. To analyse the types of colleges and their educational systems.
2. To study the range of courses offered by the colleges.
3. To assess the gender-wise distribution of librarians.
4. To examine the nature and size of library buildings.
5. To evaluate access systems practised in the libraries.
6. To measure the adequacy of library furniture and equipment.
7. To analyse the availability of ICT infrastructure.
8. To assess the physical facilities available in the libraries.

Hypotheses of the Study:

H1: There is no significant variation in the availability of ICT infrastructure across different types of colleges.
H2: Library buildings and physical facilities do not significantly differ among government, aided, and unaided colleges.
H3: The level of adequacy of library furniture is independent of the type of college.
H4: There is no association between the educational system (co-education/girls) and library resource access patterns.

Methodology:-

The present study adopts a descriptive survey research design to evaluate the library infrastructure, ICT facilities, physical amenities, and staffing patterns of degree college libraries in Karnataka. The methodology followed is described below:

Population and Sample:

The study covers a total of 60 degree colleges out of 80 degree colleges underKuvempu University,representing various institutional categories: Constituent Colleges. Government Colleges, Aided Colleges, and Unaided (Private) Colleges. These colleges were selected to represent a diverse cross-section of higher education institutions operating under different administrative and financial structures.

Data Collection:

Data were collected from Librarians using: Structured Data Sheets and Institutional Records– Colleges provided quantitative data about infrastructure, building area, furniture, ICT facilities, and physical resources. Library Statistics and Official Reports – Information on courses offered, staff patterns, and access systems was obtained from institutional documents. Secondary Sources – Published literature, policy documents, and reports were used for contextual analysis.

Tools and Techniques of Analysis:

The collected data were systematically arranged into tables under relevant categories. Descriptive statistical techniques such as frequencies, percentages, and comparative analysis were applied to interpret the data. Cross-tabulation was used to examine variations among government, aided, and unaided colleges. Findings were interpreted in relation to existing literature and national library standards.

Scope of the Study and Limitations:

The study focuses exclusively onPhysical library infrastructure, ICT facilities, Furniture and equipment adequacy, Staff distribution, Access systems, and Physical amenities. It does not measure service quality, user satisfaction, or collection size, which may be considered for future research.The study is based on self-reported institutional data, which may include minor reporting inconsistencies.Only degree colleges were includedautonomous and university libraries were excluded.The research uses descriptive statistics, without advanced statistical testing, due to the nature of the dataset.

Description of Data Analysis:

The study is based on descriptive quantitative analysis of 60-degree colleges. Data were categorised under different parameters:Type of college (Government, Constituent, Aided, Unaided), Educational system, Courses offered, Library staff, Library building nature and area, Access systems, Furniture and equipment adequacy, ICT infrastructure, Physical facilitiesPercentages were computed for each category to determine relative distribution and adequacy. Tables were analysed to derive trends, compare facilities across college types, and identify resource gaps.

Table1: Types of colleges by education system

Type of College	Education System		
	Co-Education	Only Girls	Total
Government College	26	3	29
Constituent	4	-	4
Aided College	11	2	13
Unaided (Private) College	12	2	14
Total	**53**	**7**	60
Percentage (N=60)	**88.33**	**11.67**	**100.00**

The distribution of colleges by educational system indicates that out of 60 institutions, 53 (88.33%) follow co-education, while 7 (11.67%) admit only girls. Government colleges constitute the highest representation (29), followed by unaided (14), aided (13), and constituent colleges (4). The dominance of co-education institutions reflects the widespread accessibility of higher education in the region.

Table 2: Courses Offered in Colleges

Courses Offered / Stream	Number of Colleges	Percentage (N=60)
Arts	49	81.67
Commerce	49	81.67
Science	29	48.33
BBM / BBA	28	46.67
BSW	3	5.00
BCA	16	26.67
PG	14	23.33

Analysis of academic programs shows that Arts and Commerce streams are offered by 49 colleges each (81.67%), highlighting their popularity. Science programs are available in 29 colleges (48.33%), while professional and vocational programs—such as BBA/BBM (46.67%), BCA (26.67%), and BSW (5%)—are comparatively less common. Postgraduate programs are available in 14 institutions (23.33%). The data reflects a predominance of traditional disciplines with moderate adoption of professional courses.

Table 3: Gender-wise distribution of librarians

Gender	Number of Colleges	Percentage
Male	53	88.33
Female	7	11.67
Total	60	100.00

Library staff composition reveals that 53 librarians (88.33%) are male and 7 librarians (11.67%) are female. This gender imbalance suggests a need for more inclusive recruitment policies within higher education library systems.

Library Building and Space Availability:

Table 4: Nature of library building

Nature	Number of Colleges	Percentage
Independent	19	31.67
Accommodated in the Classroom	39	65.00
Under Construction	2	3.33
Total	**60**	**100.00**

A majority of libraries are accommodated within classroom buildings (65%), while only 19 (31.67%) operate from independent buildings. Two college libraries (3.33%) are still under construction. The lack of dedicated buildings may hinder optimal library operations and user privacy.

Table 5: Area-wise distribution of libraries

Area (in Sq. Mtrs)	Number of Colleges	Percentage
< 100	5	8.33
100-200	7	11.67
200- 300	13	21.67
300-400	14	23.33
400-500	13	21.67
> 500	8	13.33
Total	**60**	**100.00**

Library sizes vary greatly; 300–400 sq. mtrs (23.33%) is the most common category. 200–300 sq. mtrs and 400–500 sq. mtrs each represent 21.67%. Only 8 libraries (13.33%) have an area above 500 sq. mtrs. 5 libraries (8.33%) have less than 100 sq. mtrs, indicating severe space constraints. Overall, the majority function with moderate space, but many still do not meet the standards recommended for higher education institutions.

Table 6: Mode of access to resources practised in the Library

Mode of access	Number of Colleges	Percentage
Closed access	25	41.67
Open access	30	50.00
Partial Open Access	5	8.33
Total	**60**	**100.00**

Access systems show that open access dominates with 30 colleges (50%), followed by closed access (41.67%) and partial access (8.33%). This shift toward open access aligns with modern library trends promoting user autonomy.

Library Furnitureand Equipment:

Table 7: Level of adequacy of library furniture and equipment

Type of Furniture		No. of colleges		
		Highly adequate	Moderately adequate	Not at all adequate
Book racks	Single faced	32 (53.33)	24 (40.00)	4 (6.67)
	Double faced	6 (10.00)	47 (78.33)	7 (11.67)
Racks for Periodicals	Single faced	24 (40.00)	17 (28.33)	19 (31.67)
	Double faced	6 (10.00)	39 (65.00)	15 (25.00)
Reading Chairs		5 (8.33)	6 (10.00)	49 (81.67)
Reading Tables		7 (11.67)	32 (53.33)	21 (35.00)
Computer Chairs		2 (3.33)	1 (1.67)	57 (95.00)
Computer Tables		0 (0.00)	24 (40.00)	36 (60.00)
Circulation Counter		16 (26.67)	23 (38.33)	21 (35.00)
Baggage/Luggage rack		8 (13.33)	11 (18.33)	41 (68.33)
Newspaper stands		6 (10.00)	21 (35.00)	33 (55.00)
New Arrivals Display Rack		43	4	13

	(71.67)	(6.67)	(21.67)
Personal Cubical	9 (15.00)	20 (33.33)	31 (51.67)
Vacuum Cleaner	10 (16.67)	20 (33.33)	30 (50.00)

The level of furniture adequacy varies significantly: Highly adequate items include New Arrivals Display Racks (71.67%) and Single-faced book racks (53.33%). Moderately adequate items dominate across double-faced racks (78.33%), reading tables (53.33%), and circulation counters (38.33%). Not adequate at all are items such as computer chairs (95%), computer tables (60%), reading chairs (81.67%), baggage racks (68.33%), and newspaper stands (55%). These findings reflect infrastructural deficiencies, especially in ICT-related seating and modern ergonomic furniture.

ICT Infrastructure:

Table 8: Availability of ICT infrastructure facilities in libraries

ICT infrastructure	No. of Colleges	Percentage
Internet-connected Desktop computers	50	83.33
Desktop Computers used for OPAC	45	75.00
Other Desktop Computers (excluding a &b)	23	38.33
Laptops	15	25.00
Servers	34	56.67
Computer-supported Printers	43	71.67
Barcode printer	36	60.00
Scanners	34	56.67
Barcode scanner	45	75.00
Photocopiers(Xerox)	32	53.33
LCD Projector	13	21.67
Web Cameras	10	16.67
CCTVs	41	68.33
UPS	36	60.00
Generator	5	8.33
Solar system	7	11.67
Bio-Metric Device	7	11.67
RFID Card Printer	0	0.00
RFID gates	0	0.00
RFID tags	0	0.00
RFID Handle Book Reader	0	0.00
RFID Based Book Drop Box	0	0.00

ICT availability indicates uneven technological development: Highly available infrastructure-Internet-connected desktops (83.33%), OPAC systems (75%), Barcode scanners (75%), Printers (71.67%), CCTV (68.33%), UPS systems (60%), Barcode printers (60%). Moderately available: Servers (56.67%), Scanners (56.67%), Laptops

(25%), LCD projectors (21.67%), Very limited availability: Photocopiers (53.33%), Web cameras (16.67%), Generators (8.33%), Solar systems (11.67%), Biometric devices (11.67%), Completely unavailable items: RFID solutions (RFID gates, tags, printers, book drop boxes). Despite adequate basic ICT infrastructure, advanced automation technologies are absent.

Availability of Physical Facilities in Libraries:

Table 9: Availability of physical facilities in types of libraries

Physical facilities	Type of college		
	Government College	Aided colleges	Unaided colleges
Purified drinking water	13 21.67	7 11.67	7 11.67
Wash room	3 5.00	3 5.00	0 0.00
Fire extinguisher	20 33.33	11 18.33	7 11.67
Aid conditioning	0 0.00	1 1.67	0 0.00
Lights and ventilation	29 48.33	17 28.33	14 23.33
Rest Rooms	2 3.33	2 3.33	3 5.00
Ceiling fans	29 48.33	17 28.33	14 23.33
Ramp for the physically challenged	4 6.67	6 10.00	5 8.33

Table 9 states that Government colleges show higher availability of safety equipment like fire extinguishers (33.33%) and lighting/ventilation (48.33%).Aided colleges show moderate availability.Unaided colleges show marginally better provision of restrooms (5%) but lower fire safety measures.No type of institution has adequate washrooms or air-conditioning.

Findings:-

The study reveals several critical insights:

1. Infrastructure disparities exist between government, aided, and unaided colleges.
2. Library buildings are often not independent, affecting the environment and functionality.
3. Furniture inadequacy, especially technological furniture, limits ICT-based learning.
4. ICT infrastructure is reasonable, but advanced technologies like RFID are absent.
5. Basic amenities such as restrooms, purified water, and ramps for the disabled remain inadequate.
6. Gender disparity among librarians suggests institutional imbalance.

These findings highlight the need for improved funding, adoption of modern library technologies, and adherence to national library standards.

Conclusion:-

This comprehensive analysis shows that while libraries in Karnataka's colleges provide basic services and moderate ICT support, significant improvements are required in building infrastructure, furniture adequacy, advanced automation, and physical facilities. Strengthening these areas will enhance user satisfaction, accessibility, and learning outcomes. Policymakers and educational administrators must prioritise library enhancement as a core component of academic development.The study concludes that while basic library services and ICT tools are available in most degree colleges in Karnataka, substantial improvements are needed in building infrastructure, furniture adequacy, physical facilities, and technological upgrades. Policymakers should prioritise comprehensive library development to ensure equitable educational access and improved learning environments.

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