



RESEARCH PAPER

Academic Libraries Emerging Trends in 21st Century: A Systematic Review

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ABSTRACT

The purpose of this research is to explore the recent developments and trends that are being used in libraries of academic institutions. The term “emerging trends” often brings to mind some basic IT-supported devices & services, but its scope extends beyond that. The rapid advancement in IT and its implication in libraries have reshaped the entire library operations. This study was conducted not only to discover these changes but to provide an overview of the obstacles faced by libraries and potential remedies to overcome them. The qualitative content analysis method was undertaken, following the PRISMA guidelines a total of 32 open-access research articles were examined that satisfied the inclusion criteria. On a similar basis, three research questions were formulated. The finding revealed that Internet of Things, Information Communication Technologies, and Artificial Intelligence have an impact on emerging trends in academic libraries that evolved the traditional library practices, but unskilled professionals, financial constraints, and inappropriate infrastructure are the main hurdles that academic libraries have been facing to employee current trends that can be overcome through staff training & development, careful planning of infrastructure and adequate funding. It is recommended that IT-integrated gadgets including RFID, Integrated library Management System should be used effectively to enhance library services, and academic libraries.

KEYWORDS Academic Libraries, Emerging Technologies, Trends in library, Review, ICT

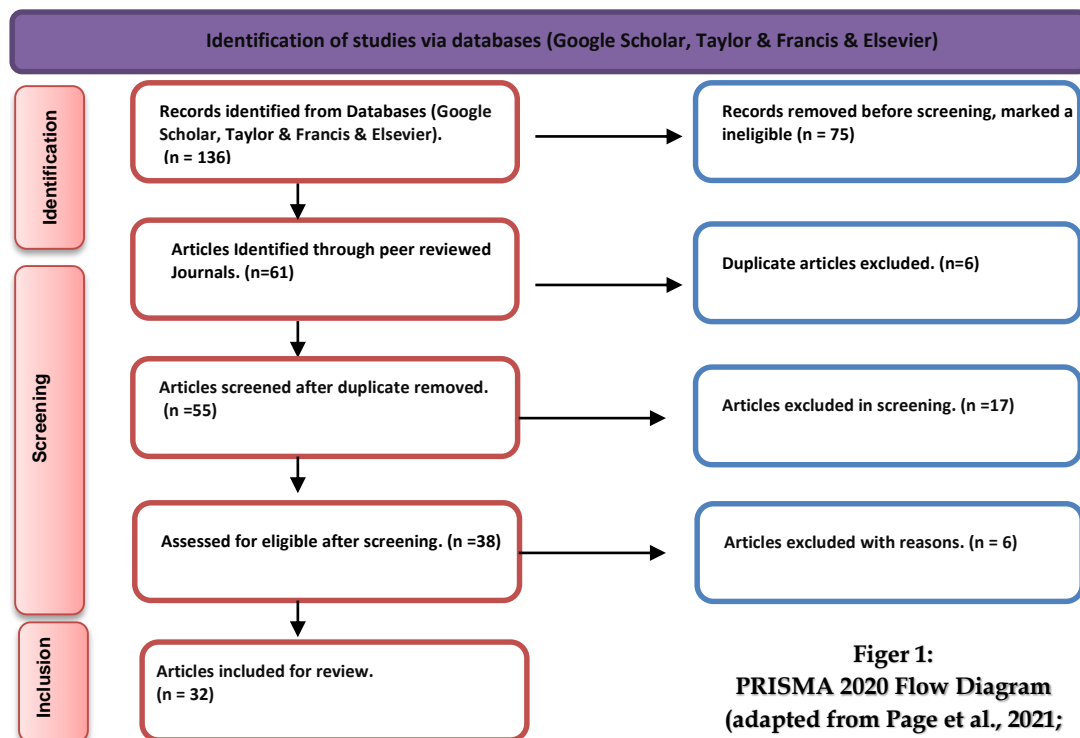
Introduction

A prevailing tendency or a widespread movement towards change and development is called a trend. Trend analysis is normally performed to find current practices or to anticipate future events (Dawar, 2014). The world itself is a dynamic entity, it is constantly changing, and the only constant thing is change (Kumbhar, 2014). The use of computers and other technologies to make information gathering, organizing, storing, retrieving, and distributing easier is known as information and communication technology, or ICT, that is one of the greatest innovations in human history, ICT has had a profound impact on how people and organizations operate worldwide, especially in libraries (Olushola et al., 2020). Globalization and ICT have transformed libraries from traditional to digital ones, where computers are used for all tasks (Rehman, Lashari & Abbas, 2023). Thus, the way libraries operate has completely changed from being service-centric to being user-centric, where libraries are maintained in accordance with user needs (Mittal, 2017). Libraries have been striving to make changes in their conventional setup, many libraries have evolved to become more than just a repository by providing online and virtual services, that reflects diverse need of users and their ease of acquiring

material (Carlozzi, 2018; Lashari et al., 2023). The exploration of new trends is crucial to understand the diverse needs of users and urge of implementation. Libraries are rapidly adopting advanced approaches to dissemination of quick and accurate information (Bharti & Verma, 2021). The reach of advancement is minimum or slow in developing & underprivileged countries due to various obstacles. The study reveals numerous contemporary trends that academic institutions adopted in their libraries (Liman & Aliyu, 2023). It also provides an in-depth glance how the libraries can overcome these challenges and prepare their institution for future challenges.

Material and Methods

This is a literature review research paper; published articles and conference papers on the topic of emerging and current trends in academic libraries were analyzed systematically. Keywords of emerging trends in academic libraries, current trends in academic libraries, trends in school libraries, trends in college libraries, advancement in academic libraries, technology inclusion in academic libraries, academic library services, IOT in academic libraries, and ICT in academic libraries were used to acquire data. Specifically, importance is given to information technology integration in conventional library services. The findings are based upon three themes, emerging trends in academic libraries, challenges in implementing new trends in academic libraries, and overcoming challenges in modernizing academic libraries. A rigorous search strategy was adopted, and peer-reviewed published papers were reviewed. To ensure the accuracy of the data, PRISMA criteria was adopted (Lashari & Umrani, 2023) for the literature review in four stages: (1) Identification, (2) screening, and (3) inclusion. A total of 136 were identified, out of which, 32 open-access articles met the criteria of evaluation research limitations (Figure 1).



Figur 1:
PRISMA 2020 Flow Diagram
(adapted from Page et al., 2021;
Lashari & Umrani, 2023)

Limitations of the study

The study assessed contemporary trends in libraries, with a specific emphasis on various IT-based services employed in educational libraries. Research articles & conference papers, accessible on Google Scholar, SpringerLink, and Scopus (Science

Direct, Web of Science (WoS), Elsevier) were searched with filtration of language (English) and period (2018-2023), published in reliable scholarly journals, using various research approaches, such as mixed methods, qualitative, & quantitative research. Reviews, preprints, Theses, reports, proceedings, white papers, book chapters, and research articles discussed other types of libraries were considered irrelevant & excluded.

Table 1
List of Reviewed Articles

SNO	Journal Name	Article	Year	Citation
1	International Conference on Distributed Computing and High Performance	IoT: Applied New Technology in Academic Libraries	2018	21
2	Reshaping of Librarianship, Innovations and Transformation	A Study on Emerging Technology trends in Academic Libraries: An Overview	2019	6
3	Conference Paper	Mobile Technologies for Academic Libraries: An Overview	2019	3
4	12th International CALIBER	Perceptions and Prospects of Artificial Intelligence Technologies for Academic Libraries: An Overview of Global Trends	2019	9
5	Nigerian Libraries	Makerspace as emerging trend in academic libraries: advocacy for adoption and domestication in Nigeria	2019	6
6	Library Philosophy and Practice (e-journal)	Library Web Portal for Academic Libraries in India: A Case Study	2019	5
7	Conference Paper	Emerging Technology Trends for Libraries and Library Professionals	2019	4
8	Science World Journal	Emerging library technology trends in academic environment - an updated review	2020	5
9	Library Progress (International)	Present status of information and communication technology in Nigerian academic libraries: A review of literature	2020	2
10	Middlebelt Journal of Library and Information Science	Application of information and communication technology in academic libraries in Kwara state, Nigeria: progress and challenges	2020	3
11	Journal of Information and Computational Science	Emerging Trends of Data Management and Data Analytical practices in Academic Libraries: A Theoretical Lens	2020	2
12	Open Journal for Information Technology	Applications of Information Communication Technology (ICT) in Academic Libraries: An Overview of Turkana University College Library	2021	2
13	Library Philosophy and Practice	Awareness and acceptance of emerging technologies for extended information service delivery in academic libraries in Nigeria	2021	8
14	International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies	Emerging Technologies in Academic Libraries: Artificial Intelligence and Big Data	2021	2
15	Library Philosophy & Practice	Use of Emerging Technologies in the University Libraries: A Study of Review of Literature	2021	6

16	New Review of Academic Librarianship	Transforming academic library operations in Africa with artificial intelligence: Opportunities and challenges: A review paper	2021	18
17	Philosophy and Practice	Librarians' ICT Competencies and Utilization of Emerging Technologies in Academic Libraries in Rivers State, Nigeria	2021	0
18	Library Philosophy and Practice	Social Media Usage in the Academic Libraries: Current Trends and Challenges in Pakistan with special reference to Facebook	2021	1
19	Library Hi Tech News	Roles and emerging trends of academic libraries in Kenya	2021	10
20	Journal of Information Management and Library Studies	Current Status of Emerging Trends in The Universities Libraries of Pakistan	2022	0
21	Library Hi Tech News	Top trends in academic libraries: A review of the trends and issues	2022	5
22	The journal of academic librarianship	Transformation of libraries during Covid-19 pandemic: A systematic review	2022	45
23	Library Philosophy and Practice	Catching Up with Innovation and Trends in University Library Services in Nigeria: An Analytical Study of University Library Websites in Nigeria	2022	2
24		Modern and Information Services of an Academic Library: An Overview	2022	2
25	IP Indian Journal of Library Science and Information Technology	New trend in ICT and its impact on library services and functions: Regards with IoT	2022	0
26	Library Philosophy and Practice	A Selective Review on Use of Information Resources and Services in Academic Libraries	2023	27
27	Library Philosophy and Practice	Adoption and utilization of artificial intelligence by librarians in university libraries in southern Nigeria	2023	23
28	Samaru Journal of Information Studies	Digital transformation and innovation of academic libraries: a content analysis	2023	0
29	Journal of Information Science	Internet of things adoption and use in academic libraries: A review and directions for future research	2023	0
30	LIS Links Newsletter	Transforming Academic Libraries: Exploring Emerging Trends and Technologies	2023	0
31	International Journal of advanced research	Navigating the future: the transformative impact of emerging trends in B-school library management systems on library users	2023	6
32	Library Waves	Applications of Information Communication Technologies in Academic Libraries		0

Nine themes were categorized based on the content of the research paper abstracts. These themes contain (1) Information Communication Technologies (2) Mobile Technologies (3) Artificial Intelligence (4) Makerspace (5) Web2.0 (6) ICT Competencies (7) Innovation & research (8) Library transformation (9) Internet of things. These themes are presented in Table 1. The themes are demonstrating the topics discussed in the articles. 23 published articles since 2018 were found in Google Scholar database, and only

9 relevant articles were found in Scopus-based journals (Traylor and Francis online Elsevier, Springer link) (Figure 1).

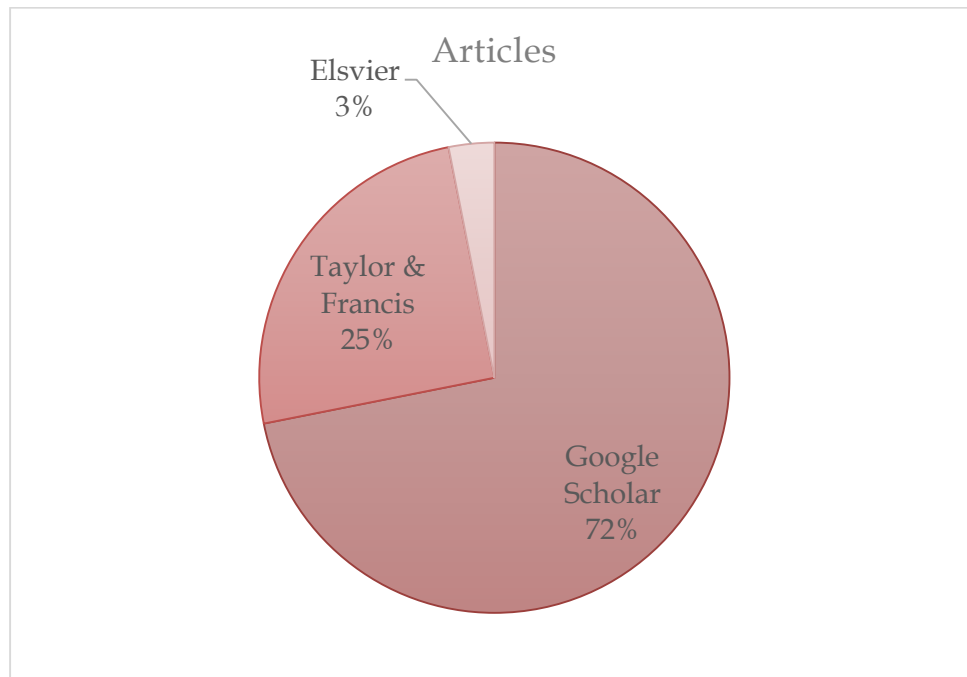


Figure 1: Articles retrieved from the Database

Literature Review

Emerging trends in academic libraries

In this era of advancement and rapid growth, scholars delve into discovering the standing of academic libraries (Bharti & Verma, 2021). The function of libraries and library experts in the age of technological progress cannot be underestimated. Considering the increasing expectations of users there is a need for the integration of emerging library technologies to meet the demands of library resources and services (Moruf & Dangani, 2020). The prosperity of many educational libraries heavily relies on the proficient and productive utilization and execution of contemporary technology amenities. It is undeniably crucial for educational libraries to comprehensively employ its utilization (Olushola et al., 2020). Through a comprehensive study, various emerging trends have been identified which have been implemented in academic libraries to meet current needs.

Use of Internet of Things in Academic Libraries

The terms "Internet of Things" (IOT) refer to the usage of Internet-associated devices and systems to access data. IOT technologies can be helpful in acquiring, analyzing, storing, and exchanging information. They can also be helpful in collection management, online services. IOT can benefit libraries by making the most use of available space, (Mohammadi & Yegane, 2018). Academic libraries are becoming dynamic hubs for learning and research (Gaikwad & Bilawar, 2023) and the IoT is an incredibly advantageous technology that enables the quick provision of numerous services through a variety of internet-connected devices (Dongare, 2022; Lashari & Umrani, 2023). Different kinds of practices based on IoT were found in academic libraries, automated circulation systems (self-book issue and return), RFID-based record management & movement tracking of the resources, tracing user data from

virtual/physical cards, seat reservations, self-managed virtual tours, smart lighting system, environment control system, smart security gates, fire detection, auto alarm, (Asim & Arif, 2023) drones, which can be utilized in libraries and reading rooms for monitoring stacks and students (Dongare, 2022). Libraries should explore implementing the Internet of Things. (Saibakumo, 2021)

Information Communication Technologies in academic libraries

Integration of information and communication technology (ICT) has significantly improved the services of academic libraries. It has transitioned library services from simple storage facilities to complex knowledge management hubs (Shehu et al., 2020; Fayaz et al., 2023). The digital transformation of academic libraries has been enabled by various ICT applications, such as open-source library management software, online e-resources, library web portals, institutional repositories, cloud computing, and social media, providing users with convenient access to virtual libraries (Saxena & Kumar, 2019). The provision of ICT-integrated services can be easily provided to users beyond the limitation of time and space (Onunga, 2021). Libraries of educational institutions usually utilize social media platforms to promote their library services and resources, some professionals use their own social media handles for this purpose (Humbhi & Humbhi, 2021).

Use of Artificial Intelligence in Academic Libraries

The provision of library services in libraries has been revolutionized by AI Technology, allowing them more advanced and customized services that meet their need and preferences (Echedom & Okuonghae, 2021). Artificial Intelligence offers several tools that can significantly improve services such as information searching, retrieval, processing, and management. It can be utilized by librarians for a range of tasks, including examining and evaluating information, providing information literacy skills, providing reference services, and information search and retrieval processes (Gujral et al., 2019). A variety of AI tools are suitable for academic libraries, such as RFID technologies, machine-readable catalogs, AI classification tools, chatbots, face recognition, robots, touch recognition, and AI smart features; however, the most common AI tools found in university libraries are security scanning devices at entrances and exits (Emiri, 2023; Lashari & Umrani, 2023).

Challenges in implementing emerging trends in academic libraries.

The analysis reveals that academic libraries have faced various challenges in implementing new trends for innovations and digital transformation. Inadequate digital literacy training, inadequate digital technology competency, negative attitudes and perceptions about digital literacy, ignorance of digital technology, and poor use of digital resources (Liman & Aliyu, 2023). Even though there are still a lot of improvements and advancements being made, the adoption of current trends in academic libraries has been lacking pace (Otikey & Barát, 2021). Another study revealed that the inadequate power supply, the inexperienced personnel, and the slow internet speed are the cause of slow progress (Humbhi & Humbhi, 2021). Even though putting these new technologies into practice could be expensive, it is essential to match user needs and stay current in the rapidly evolving academic field. Conducting feasibility studies and adopting a targeted approach are necessary to guarantee the future functionality of emerging technologies (Gaikwad & Bilawar, 2023). The main challenges of IoT were found to be secrecy and security, the cost of IoT gadgets, the absence of policies and standards, the need for a well-integrated environment, the absence of managerial interest, the lack of skilled

personnel, insufficient knowledge and understanding of IoT, incompatibility, and the complexity of the IoT structure (Asim & Arif, 2023). It is evident from ICT applications, devices, and library and information professionals' ICT skills that its implementation in academic libraries is still in its beginnings (Shehu et al., 2020). Nevertheless, despite the advantages of implementing AI in libraries, several obstacles still stand in the way, including human error in coding, a lack of human touch, technological malfunctions of all kinds, inadequate infrastructure, and unstable power supplies (Echedom & Okuonghae, 2021).

Overcoming challenges in modernizing academic libraries

Libraries hold the potential to shape & influence future educational outcomes, by adopting emerging trends to enhance academic experience. These libraries are dynamic organizations that greatly benefit the academic community by providing a setting that is conducive to research, learning, and knowledge generation. They are more than just repositories (Kalisdha, 2023). To keep up with advancements in technology, libraries of the future will require new devices and networking technologies, making it crucial for users and librarians to have a comprehensive understanding of new technologies (Mohammadi & Yegane, 2018). Libraries should carefully consider their offerings in the digital space and adapt accordingly (Sheik, 2017). To keep up with the fast-paced technological advancements, academic libraries should persistently adjust and transform to fulfill the shifting requirements and anticipations of students, faculty, and researchers (Gaikwad & Bilawar, 2023). To ensure proper execution of the rules governing the implementation of contemporary technology in academic libraries, librarians must receive training on how to use modern technologies. It is also necessary to conduct an awareness campaign for library patrons (Saibakumo, 2021). The emergence of technology in libraries can be further advanced through successful implementation, leading to enhanced partnerships between librarians and stakeholders and improving the services provided by libraries (Gujral et al., 2019). A study also emphasized the importance of integrating of all services into a web-based system that provides available data to users through a single point of access, considering the functionalities of surfing, browsing, and retrieving required documents (Das, 2019). To maintain the innovation and emerging trends in library services, academic libraries must have official library websites integrated with all innovative services (Mbagwu, 2022). The training and development of employees continue to be fundamental components of library work (Bharti & Verma, 2021). The only way library professionals can do their jobs and obligations is if they are committed to continuous self-improvement and being at the forefront of technological advancements (Moruf & Dangani, 2020). Adequate funding is essential for establishing a well-equipped library with modern infrastructure, while a consistent policy is necessary for digitizing library holdings (Gul & Jamal, 2022). The study concludes that, despite advancements and the digital transformation, developing nations still argue in how they are integrating digital content into their library services. To adapt to digital advances, the article suggests that academic libraries step up their rigorous research in digital technology fields (Liman & Aliyu, 2023).

Discussion

It was found that academic libraries are open to the idea of adopting new trends in their libraries to make their work easier. The integration of information technology has significantly transformed traditional library services. Library administrators and staff are highly interested in adopting these trends, including IoT, ICT, and AI-based services and technologies such as library automation, web portals, social media, cloud

computing, e-repositories, digital and virtual libraries, OPAC, robots, consortia, and cloud computing, among others.

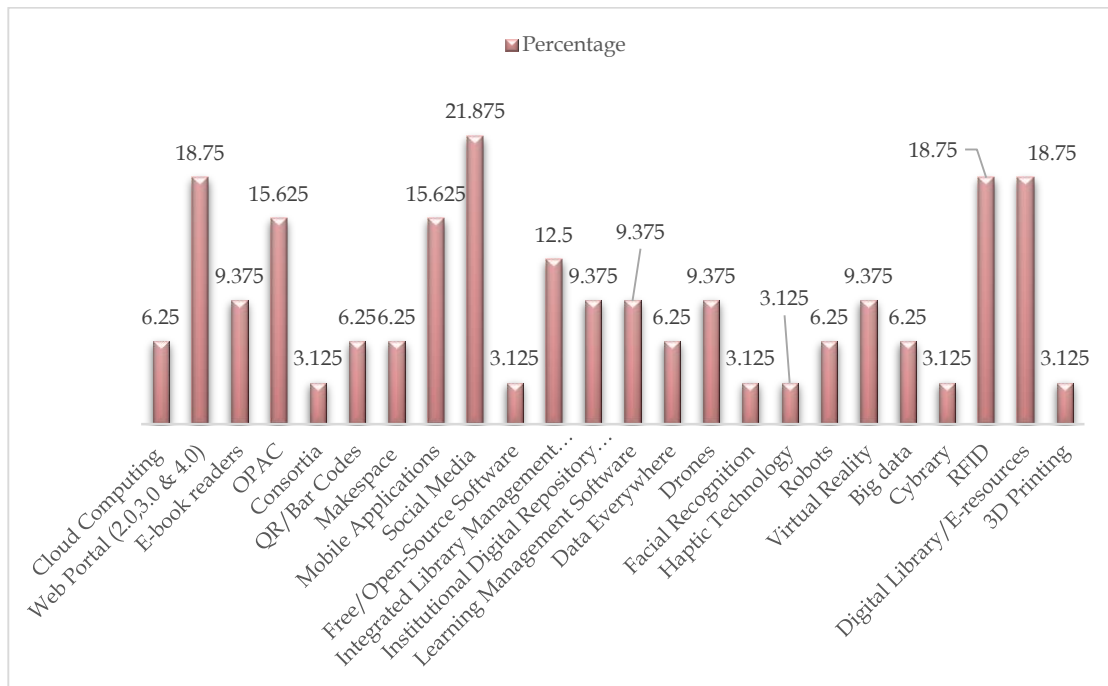


Figure 2: Most Adopted Emerging Trends in Academic Libraries

One significant aspect highlighted in most papers was the hurdles faced by library management in implementing these emerging trends. A thorough analysis revealed that, inadequate funding, unskilled library professionals, interrupted power supply, absence of infrastructure/equipment, lack of awareness are the main hurdles that academic libraries have been facing in the adoption of current trends, as shown in Figure 3.

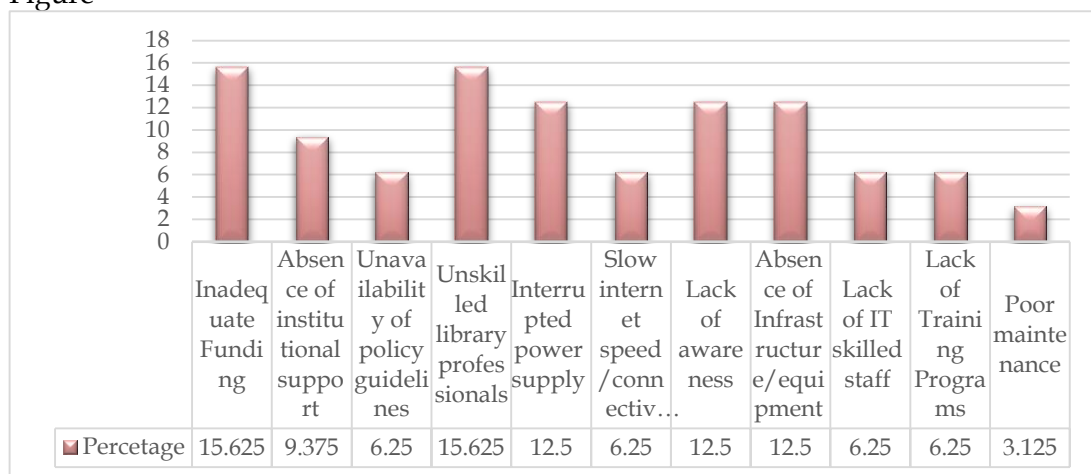


Figure 3: Major challenges faced by academic libraries.

Despite these challenges, some suggestions were given in the examined literature. Most papers emphasized the need for staff training and development, suggesting that library professionals should raise awareness of these trends among their patrons via students' Literacy programs and integrate their services with single access points, such as web portals and social media as shown in figure 4.

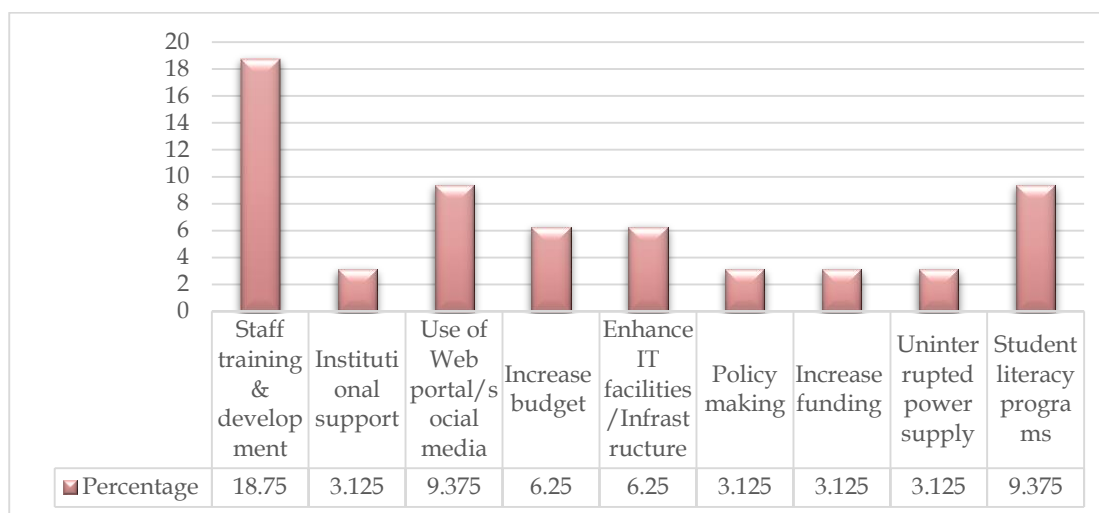


Figure 4: Suggestion to overcome challenges.

Conclusion

The main objective of the study is to analyze accessible research articles on the emerging trends of academic libraries. It explores the trends which have been used in other parts of the world including challenges faced by them. This review also helps professional librarians to understand their standing in the current situation. Moreover, it highlights the importance of users' awareness. The study examines the library services, considering the technological atmosphere. It provides insight into the emerging technologies that are quickly becoming necessary for every person. This review reveals that with the increasing involvement of technology in society, there is a corresponding increase in associated problems. Therefore, libraries must keep pace with the implementation of advanced technologies to provide adequate services and resources. With the adoption of these technologies in delivery services, it is recommended to acquire adequate training.

Recommendations

It is recommended that the academic libraries should have their e-collection of books and research material for easy access to the users. The academic libraries should develop their social media platforms, websites, library management system and Online Public Access Catalogue for better access of the resources from anywhere else. Libraries should be provided funding for expanding the resources. The staff should be trained well regarding management and use of ICT for provision of better services.

References

- Aavarti, S., T R, M., Chaudhary, P., Asjola, V., & Kumar, P. (2019, February 2). Emerging Technology Trends for Libraries and Library Professionals. *Librarianship Development through Internet of Things & Customer Service (LDITCS 2019)*, Mehsana, Gujarat.
- Amogu, U. K., & Okezie, C. (2019). Makerspace as emerging trend in academic libraries: advocacy for adoption and domestication in Nigeria. *Journal of the Nigerian Library Association*, 52(1), 78-89.
- Ashiq, M., Jabeen, F., & Mahmood, K. (2022). Transformation of libraries during Covid-19 pandemic: A systematic review. *The journal of academic librarianship*, 48(4), 102534.
- Asim, M., & Arif, M. (2023). Internet of Things adoption and use in academic libraries: A review and directions for future research. *Journal of Information Science*, 1, 1-16.
- Bharti, K. L., & Verma, D. S. (2021). Use of Emerging Technologies in the University Libraries: A Study of Review of Literature. *Library Philosophy and Practice (e-journal)*. 6134.
- Carlozzi, M. (2018, May 29). The Socioeconomic Profile of Well-Funded Public Libraries: A Regression Analysis. *Evidence-Based Library and Information Practice*, 13(2), 13-26.
- Das, R. (2019). Library Web Portal for Academic Libraries in India: A Case Study. *Library Philosophy and Practice (e-journal)*. 2977.5-22.
- Dawar, V. (2014, September 12). Changing Trends in Academic Libraries: An Overview. *Reshaping the Academic Libraries: Trends and Issues (REALITI)*.
- Dongare, M. P. (2022). New trend in ICT and its impact on library services and functions: Regards with IoT. *IP Indian Journal of Library Science and Information Technology*, 7(1), 14-17.
- Echedom, A. U., & Okuonghae, O. (2021). Transforming academic library operations in Africa with artificial intelligence: Opportunities and challenges: A review paper. *New Review of Academic Librarianship*, 27(2), 243-255, DOI: 10.1080/13614533.2021.1906715.
- Emiri, O. T. (2023). Adoption and utilisation of artificial intelligence by librarians in university libraries in southern Nigeria. *Library Philosophy and Practice (e-journal)*. 7570.
- Fayyaz, S., Lashari, A. A., Rafiq, K., & Jabeen, N. (2023). Montessori teachers' communication effects on cognitive development of children. *Journal of Namibian Studies: History Politics Culture*, 33, 115-131.
- Gaikwad, M. N., & Bilawar, P. B. (2023). Transforming Academic Libraries: Exploring Emerging Trends and Technologies. *LIS Links Newsletter*, 9(1), 1-9.
- Gujral, G., Shivarama, J., & Choukimath, P. A. (2019). Perceptions and prospects of artificial intelligence technologies for academic libraries: An overview of global trends. *12th International CALIBER*, 79-88.

- Gul, A., & Jamal, E. Q. (2022). Current status of emerging trends in the universities libraries of Pakistan. *Journal of Information Management and Library Studies*, 5(1), 48–58.
- Humbhi, S., & Humbhi, A. (2021). Social media usage in the academic libraries: Current trends and challenges in Pakistan with special reference to Facebook. *Library Philosophy and Practice(e-journal)*.5772.
- Kalisdha, A. (2023). Navigating the future: the transformative impact of emerging trends in B-school library management systems on library users. *International Journal of advanced research*, 11(11), 134–140
- Kannappanavar, B. U. (2023). A selective review on use of information resources and services in academic libraries. *Library Philosophy and Practice (e-journal)*.7720.
- Komosany, N. B. A., & Alnwaimi, G. R. (2021). Emerging technologies in academic libraries: artificial intelligence and big data. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 12(4), 1–17.
- Kumbhar, R. M. (2014, November 19). Academic library's responses to the emerging trends in higher education. *DESIDOC Journal of Library & Information Technology*, 34(6), 477–485
- Krishnan, B., & Sankar, B. (2022). Modern and information services of an academic library: An overview. *Library Philosophy and Practice (e-journal)*. 7532.
- Lashari, A. A., Mahar, S. S., Solangi, M. A., Buriro, S. A., & Chang, S. H. (2023). Music education in language and cognitive development: A critical review. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 20(2), 2101-2111.
- Lashari, A. A., & Umrani, S. (2023). Reimagining self-directed learning language in the age of artificial intelligence: A systematic review. *Grassroots (17260396)*, 57(1). 92-114.
- Liman, Y. A., & Aliyu, M. M. (2023). Digital transformation and innovation of academic libraries: A content analysis. *Samaru Journal of Information Studies*,23(1), 1–15.
- McAllister, A., Flierl, M., Caswell, T. R., Costello, L., Hall, A., Li, C., ... & Walker, G. (2022). Top trends in academic libraries: A review of the trends and issues. *College & Research Libraries News*, 83(6), 243-256.
- Maideen, S., & Oke, O. C. (2019). A Study on Emerging Technology trends in Academic Libraries: An Overview. *Reshaping Librarianship: Innovations and Transformations*. Bharathiar University Coimbatore – 641 046, Tamil Nadu, India.
- Mbagwu, F. (2022). Catching up with innovation and trends in university library services in Nigeria: An Analytical Study of University Library Websites in Nigeria. *Library Philosophy and Practice (e-journal)*. 7093
- Mittal, A. (2017, September 16). Emerging Technologies and their Impact on the Libraries. *Indian Journal of Science and Technology*, 10(31), 1–4.

- Mohammadi, M., & Yegane, M. (2018, November). IOT: applied new technology in academic libraries. In *International Conference on Distributed Computing and High Performance (DCHPC)*, (pp. 1-12).
- Moruf, H. A., & Dangani, B. U. (2020). Emerging library technology trends in academic environment-an updated review. *Science World Journal*,15(3), 13-18.
- Olushola, A., Nwalo, K., & Ajani, Y. (2020). Application of information and communication technology in academic libraries in Kwara state, Nigeria: progress and challenges. *MBJLIS – Middlebelt Journal of Library and Information Science*, 18(2020), 70-88.
- Omehia, A., Okwu, E., & Nsirim, O. (2021). Librarians' ICT Competencies and Utilization of Emerging Technologies in Academic Libraries in Rivers State, Nigeria. *Library Philosophy and Practice (e-journal)*. <https://digitalcommons.unl.edu/libphilprac/5410>.
- Onunga, Jeremiah Osida Applications of Information Communication Technology (ICT) in Academic Libraries: An Overview of Turkana University College Library. (2021). *Open Journal for Information Technology*, 4(2), 35-40.
- Otike, F., & Barát, Á. H. (2021). Roles and emerging trends of academic libraries in Kenya. *Library Hi Tech News*, 38(7), 19-23.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D. et al. (2021, March 29). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, n71. <https://doi.org/10.1136/bmj.n71>
- Rehman, M. A., Lashari, A. A., & Abbas, S. (2023). Analysis of sustainable academic performance through interactive learning environment in higher education. *Global Economics Review*, 8(2), 129-139.
- Saibakumo, W. T. (2021). Awareness and acceptance of emerging technologies for extended information service delivery in academic libraries in Nigeria. *Library Philosophy and Practice (ejournal)*. 5266.
- Saxena, K. P., & Kumar, R. (2019). Applications of Information Communication Technologies in Academic Libraries. *Library Waves*,5(2), 61-67.
- Shehu, A. B., Singh, K. P., & Oyiza, H. O. (2020). Present status of information and communication technology in Nigerian academic libraries: A review of literature. *Library Progress (International)*, 40(1), P.25-33.
- Sheik, M. A. (2017). Mobile Technologies for Academic Libraries: an overview. *Emerging Trends in Library and Information Science*.
- Shah, D.-N., Bin Naeem, S., & Bhatti, R. (2020). Emerging Trends of Data Management and Data Analytical Practices in Academic Libraries: A Theoretical Lens. *Journal of Information and Computational Science*, 10(4), 545-556.