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User Perception of Artificial I Intelligence in Academic Libraries: A Study

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Abstract

This study aims to explore how users perceive the use of Artificial Intelligence (AI) tools in academic libraries. Data were collected through a questionnaire survey, with 1186 questionnaires distributed to patrons of academic libraries, 968 were fully answered. Of these, 81.61% were returned. The study focuses on the goals and value of Artificial Intelligence in libraries, as reported by users from higher education institutions in Dindigul District. The top priority identified by users was "Improved Information Retrieval." Additionally, faculty members shared their perspectives on the application of Artificial Intelligence in library services. The fourth and fifth most preferred uses of Artificial Intelligence were "Automating Processes and Optimizing Collection Management" and "Predictive Analysis" in academic librarianship.

Keywords: Library resources, Library Services, User Satisfaction and Artificial Intelligence.

Introduction

Artificial Intelligence (AI) is a technology that replicates human intelligence in machines, enabling them to perform tasks that typically require human intelligence. It can be categorized into narrow AI, which performs specific tasks, and general AI, also known as strong AI or AGI, which can understand and learn from unusual tasks. Techniques include machine learning, deep learning, natural language processing, and computer vision. AI has applications in various industries, including healthcare, finance, automotive, retail, and entertainment, for tasks like personalized recommendation systems, fraud detection, medical diagnosis, autonomous vehicles, and virtual assistants like Siri and Alexa. However, AI raises ethical, communal, and economic concerns, such as privacy, job dislocation, unfair algorithms, and potential misuse. Addressing these challenges responsibly is crucial for ensuring AI's benefits for society.

Academic Library

Academic libraries cater to students, teachers, and researchers with high core demands and background materials use. Users are classified into various categories, with varying information demands. Library services like collection building, processing, stacking, and display are tailored to users' needs. Understanding users' information needs is crucial for libraries to justify their existence and serve their purpose.

The Advantage of AI in Academic Libraries

AI is revolutionizing libraries by improving efficiency, accuracy, personalized recommendations, intelligent resource management, virtual assistants, chatbots, data analytics, and knowledge sharing. Academic users, including students, teachers, and researchers, have the highest information demands in libraries. Understanding users' needs is crucial for libraries to serve their purpose effectively. Therefore, systematic study and assessment of user information needs are essential.

Review of Related Literature

Dattatraya Kalbande., & et al., (2024). The study explores the views of Indian library and information science professionals on the integration of artificial intelligence (AI) in academic libraries. The data was collected from 259 respondents, who expressed positive attitudes towards AI integration, believing it could improve library services. However, they expressed cautious optimism due to employment and resource allocation concerns. Despite these concerns, they showed proactive attitudes towards AI technology and its implications for library services.

Marasinghe., & et al (2024). AI is revolutionizing library services by providing efficient and quality service delivery through AI-powered systems. It can automate operations and provide 24/7 assistance to users. Libraries are increasingly integrating AI into their operations and service delivery. This study aims to assess the current knowledge on AI application in library services and identify research gaps. The study uses the Systematic Literature Review (SLR) methodology and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to conduct a systematic literature review.

Madireng Monyela., Adeyonka Tella., (2024). The study investigates the use of artificial intelligence (AI) in academic libraries, focusing on sustainability in information management. It found that AI can improve knowledge organization practices by streamlining cataloguing, enriching metadata, and providing personalized services. However, ethical concerns about data privacy, algorithmic transparency, and user empowerment need to be addressed. The study concludes that AI can revolutionize knowledge organization, aligning with sustainable development goals. Libraries can optimize workflows, promote digital literacy, and contribute to a more inclusive and environmentally conscious information ecosystem. The study recommends investing in AI education, collaborating with developers and stakeholders, and continuously monitoring AI applications to ensure alignment with sustainability objectives and user needs.

Objective of the study

- To distribution of questionnaires in higher education institutions in the dindigul district
- The purpose and usefulness of artificial intelligence in libraries
- To find out revolution of artificial intelligence in academic libraries
- To find faculty opinion about artificial intelligence implementation
- To opinion regarding the artificial intelligence application in library services
- To opinion about accessing artificial intelligence tools for academic research
- To accessing artificial intelligence tools for patron experiences

For Analyses

The questionnaires were distributed among the Faculty of higher education institutions in the Dindigul

District.

Table - 1: Distribution of Questionnaires in Higher Education Institutions in the Dindigul District

Questionnaires Distributed	Questionnaires Received	Percentage
1186	968	81.62

The above table displays the distribution of questionnaires among 20 arts and science higher educational institutions in dindigul district, with 1186 questionnaires were distributed. Out of these, 968 were fully answered; resulting in on more than eighty one percent (~81.61) was the response rate.

Table - 2: Purpose and Usefulness of Artificial Intelligence in Libraries

S.No	Description	NU	NO	SU	U	MU	M	SD	R
1.	Improved Information Retrieval	72 (7.44%)	79 (8.16%)	40 (4.13%)	189 (19.52%)	588 (60.74%)	4.180	1.270	1
2.	Personalized Recommendations	96 (9.92%)	97 (10.02%)	56 (5.79%)	202 (20.87%)	517 (53.41%)	3.978	1.374	4
3.	Making Professional Development	63 (6.51%)	99 (10.23%)	66 (6.82%)	224 (23.14%)	516 (53.31%)	4.065	1.262	2
4.	Intelligent Resource Management	87 (8.99%)	46 (4.75%)	69 (7.13%)	375 (38.74%)	391 (40.39%)	3.968	1.214	5
5.	Virtual Assistants and Chatbots	90 (9.30%)	77 (7.95%)	93 (9.61%)	396 (40.91%)	312 (32.23%)	3.788	1.237	7
6.	Data Analytics for Decision-Making	90 (9.30%)	99 (10.23%)	84 (8.68%)	354 (36.57%)	341 (35.23%)	3.782	1.280	8
7.	Collaboration and Knowledge Sharing	92 (9.50%)	43 (4.44%)	88 (9.09%)	426 (44.01%)	319 (32.95%)	3.865	1.199	6
8.	Finding Relevant Information	96 (9.92%)	97 (10.02%)	56 (5.79%)	202 (20.87%)	517 (53.41%)	3.991	1.176	3

(NU-Not Useful, NO-No Opinion, SU-Somewhat Useful, U-Useful, MU-More Useful, M-Median, SD-Standard Deviation, R-Rank)

The above table lists the goals and benefits of Artificial Intelligence in libraries as users at Dindigul District higher education institutions reported. A five-point scale with the options ‘Not Useful’, ‘No Opinion’, ‘Somewhat Useful’, ‘Useful’ and ‘More Useful’ is used to measure it. 'Improved Information Retrieval' was the first preference listed. The faculty's ‘Making Professional Development’ and ‘Finding Relevant Information’ have determined the second and third preferences. Data Analytics for Decision-Making by the user received the least choice. All the variables have mean values ranging from 3.782 to 4.180. The range of the deviation is 1.091 to 1.374. The table shows that every variable falls within the ‘Useful’ and ‘More Useful’. The table indicates that the library's resources. It is concluded from the table

that the library resources are more useful for 'Data Analytics for Decision-Making' and very few faculty have preferred the 'Data Analytics for Decision-Making'.

The Revolution of Artificial Intelligence in Academic Libraries

Artificial Intelligence (AI) is revolutionizing academic libraries by improving cataloging, classification, and organizing digital resources. It can also enhance user services through chatbots, personalized recommendations, and predictive analytics. AI can also predict future needs and preferences, allowing libraries to plan services more effectively. The benefits of AI include enhanced user experience, greater efficiency, and data-driven decision-making. AI systems can learn from user interactions to provide tailored recommendations, making the library experience more rewarding.

AI can also improve library accessibility by converting visual resources into formats suitable for visually impaired users. Tools like Facebook's Automatic Alternative Text use AI to identify objects in images and generate captions for users with limited vision. AI can automate routine tasks, allowing library staff to focus on more complex tasks.

AI can also help libraries track the progress of public research, as demonstrated by the Allen Institute for Artificial Intelligence's Semantic Scholar search engine. However, ethical concerns such as data privacy and job displacement must be addressed to ensure responsible implementation of AI systems.

Table -3: Revolution of Artificial Intelligence in Academic Libraries

S.No	Description	SDA	DA	NO	A	SA	M	SD	R
1.	AI for Cataloging and Classification	83 (8.57%)	60 (6.20%)	77 (7.95%)	294 (30.37%)	454 (46.90%)	4.008	1.253	3
2.	The Potential Benefits of AI in Libraries	84 (8.68%)	80 (8.26%)	52 (5.37%)	314 (32.44%)	438 (45.25%)	3.973	1.272	6
3.	AI for User Services	44 (4.55%)	52 (5.37%)	16 (1.65%)	433 (44.73%)	423 (43.70%)	4.177	1.023	1
4.	Enhanced User Experience	79 (8.16%)	73 (7.54%)	66 (6.82%)	315 (32.54%)	435 (44.94%)	3.986	1.247	4
5.	AI Improved Efficiency	83 (8.57%)	81 (8.37%)	65 (6.71%)	404 (41.74%)	335 (34.61%)	3.854	1.225	7
6.	Data Driven Decision making	44 (4.55%)	99 (10.23%)	71 (7.33%)	453 (46.80%)	301 (31.10%)	3.897	1.092	5
7.	AI for Predictive Analysis	76 (7.85%)	49 (5.06%)	89 (9.19%)	331 (34.19%)	423 (43.70%)	4.008	1.200	2

(SDA-Strongly Disagree, DA- Disagree Agree, NO-No Opinion, A-Agree, SA-Strongly Agree, M-Median, SD- Standard Deviation, R-Rank)

The above table revealed that the faculty-rated Artificial Intelligence revolution in academic libraries was disseminated and displayed. 'AI for User Services' is clearly the table to which the faculty prioritized. 'AI for Predictive Analysis' and 'AI for Cataloging and Classification' was the faculty's second and third choices. The faculty's 'AI Improved Efficiency' received the least amount of

preference. The range of the mean value is 3.854 to 4.177. The variation spans 1.023 through 1.225. Evidently, every variable falls in the range of 'Agree' to 'Strongly Agree'.

The Challenges of Implementing Artificial Intelligence in Libraries

As libraries adapt to the digital age, they face challenges like technological limitations, privacy concerns, and ethical issues. To fully leverage the potential of Artificial Intelligence, libraries must overcome various obstacles and ensure its responsible integration into their operations.

Table – 4: Faculty Opinion about Artificial Intelligence Implementation

S.No	Description	NU	NO	SU	U	MU	M	SD	R
1.	Methods, Processes and Procedures	38 (3.90%)	78 (8.10%)	71 (7.33%)	410 (42.36%)	371 (38.33%)	4.031	1.064	3
2.	Experimental Designs, Results and Applications	64 (6.61%)	55 (5.68%)	98 (10.12%)	354 (36.57%)	397 (41.01%)	3.997	1.155	5
3.	Technological Constraints	38 (3.93%)	78 (8.06%)	54 (5.58%)	376 (38.84%)	422 (43.60%)	4.101	1.076	1
4.	Theoretical Background / Basic Scientific and Technical Information	43 (4.44%)	87 (8.99%)	91 (9.40%)	309 (31.92%)	438 (45.25%)	4.045	1.142	2
5.	Product, Material equipment and Apparatus know how Information	81 (8.37%)	80 (8.26%)	99 (10.23%)	280 (28.93%)	428 (44.21%)	3.924	1.274	7
6.	Information about Current Developments in your field	51 (5.27%)	65 (6.71%)	95 (9.81%)	373 (38.53%)	384 (39.67%)	4.006	1.113	4
7.	Scientific and Technical news	89 (9.19%)	82 (8.47%)	58 (5.99%)	319 (32.95%)	420 (43.39%)	3.929	1.287	6

(NU-Not Useful, NO-No Opinion, SU-Somewhat Useful, U-Useful, MU-More Useful, M-Median, SD-Standard Deviation, R-Rank)

The above table displays the faculty's opinions regarding the use of artificial intelligence. It was discovered that the faculty prioritizes the 'Technological Constraints' above all else. The second and third preferences listed by the Faculty are 'Theoretical background / Basic scientific and Technical Information' and 'Methods, Processes and Procedures'. The faculty selected 'Product, Material equipment and Apparatus know how Information' as their least preferred option. The majority of faculty members stated that using artificial intelligence is more beneficial, with mean values ranging from 3.924 to 4.101. The range of the variance is 1.076 to 1.274.

Example use Cases of Artificial Intelligence in Libraries

Libraries around the world are increasingly integrating Artificial Intelligence (AI) into their systems to enhance services and streamline operations. AI's capacity to learn, reason, and self-correct presents significant opportunities to transform library services, from automating routine tasks to offering personalized experiences for users. Practical examples of AI in libraries include chatbots, which enhance user experience and allow staff to focus on more complex inquiries. The Library of Congress, for example, employs machine learning for digital preservation, helping to categorize and organize digital materials for easier access.

Academic librarianship in the 21st century requires a strong foundation in data science and machine learning, which libraries are leveraging to improve the discoverability of collections and resources. For instance, Stanford University Libraries has utilized speech recognition software to digitize and preserve historical records. Advanced library service platforms can automate processes and optimize collection management, enhancing operational efficiency and reducing costs. Additionally, Artificial Intelligence can be used for predictive analysis, enabling libraries to anticipate and meet future user needs and preferences. However, as libraries embrace these technologies, it is essential to balance their benefits with the need to safeguard user privacy and maintain ethical standards.

Table – 5: Opinion Regarding the Artificial Intelligence Application in Library Services

S.No	Description	SDA	DA	NO	A	SA	M	SD	R
1.	It facilitates quick access to current data.	89 (9.19%)	74 (7.64%)	70 (7.23%)	350 (36.16%)	385 (39.77%)	3.897	1.263	6
2.	Speech Recognition	91 (9.40%)	70 (7.23%)	55 (5.68%)	288 (29.75%)	464 (47.93%)	3.996	1.294	2
3.	Chatbot	63 (6.51%)	78 (8.06%)	61 (6.30%)	308 (31.82%)	458 (47.31%)	4.054	1.201	1
4.	Increased job satisfaction	53 (5.48%)	127 (13.12%)	61 (6.30%)	407 (42.05%)	320 (33.06%)	3.841	1.178	8
5.	Help to improve Communication and fluency	83 (8.57%)	68 (7.02%)	69 (7.13%)	444 (45.87%)	304 (31.40%)	3.845	1.190	7
6.	Improve the status of academic excellence	71 (7.33%)	64 (6.61%)	46 (4.75%)	421 (43.49%)	366 (37.81%)	3.978	1.162	3
7.	Automating Processes and Optimizing Collection Management	66 (6.82%)	65 (6.71%)	66 (6.82%)	439 (45.35%)	332 (34.30%)	3.936	1.136	4
8.	Predictive Analysis	68 (7.02%)	80 (8.26%)	61 (6.30%)	420 (43.39%)	339 (35.02%)	3.911	1.170	5

The above table revealed that opinion regarding the artificial intelligence application in library services, in between the categories 'Help to improve Communication and fluency' is agree with the faculty has

expressed about AI applications employed in library services; followed the faculty agreed that using AI in library services will lead to by 'Automating Processes and Optimizing Collection Management'. The variable's mean value falls between 3.841 and 4.054. The range of standard deviations is 1.201 to 1.178.

Table - 6: Opinion about Accessing Artificial Intelligence tools for Academic Research

S.No	Description	SDA	DA	NO	A	SA	M	SD	R
1.	Research Rabbit	54 (5.58%)	71 (7.33%)	54 (5.58%)	342 (35.33%)	447 (46.18%)	3.795	1.143	7
2.	Puzzle Labs	77 (7.95%)	97 (10.02%)	74 (7.64%)	434 (44.83%)	286 (29.55%)	3.780	1.201	8
3.	Scite	63 (6.51%)	67 (6.92%)	79 (8.16%)	297 (30.68%)	462 (47.73%)	4.062	1.191	2
4.	OpenRead	67 (6.92%)	95 (9.81%)	66 (6.82%)	310 (32.02%)	430 (44.42%)	3.972	1.236	4
5.	Cohesive	94 (9.71%)	55 (5.68%)	44 (4.55%)	356 (36.78%)	419 (43.29%)	3.982	1.257	3
6.	Consensus	93 (9.61%)	63 (6.51%)	58 (5.99%)	466 (48.14%)	288 (29.75%)	3.819	1.205	6
7.	Lateral	58 (5.99%)	77 (7.95%)	89 (9.19%)	449 (46.38%)	295 (30.48%)	3.874	1.113	5
8.	EndNote	83 (8.57%)	84 (8.68%)	80 (8.26%)	422 (43.60%)	299 (30.89%)	4.092	1.212	1

It is found that the faculty has given opinions about AI tools for academic research in library, with 'Endnote' as the first preference and 'Scite' and 'Cohesive' as the second and third preference. The faculty agreed with the opinion 'PuzzleLabs' to use the AI in library services as the last preference indicated by them. The mean value of the variable range between 3.780 to 4.054, the standard deviation range between 1.113 to 1.257.

Artificial Intelligence Tools to Enhance Patron Experiences

Librarians use tools like Copyscape and Perplexity Artificial Intelligence to ensure library materials are original and free from plagiarism, safeguarding the library's integrity while providing quick answers to basic queries. Perplexity AI helps librarians stay current with research trends, integrating up-to-date knowledge to better serve patrons' evolving needs. Grammarly, on the other hand, ensures clear, professional writing by eliminating errors, building trust, and ensuring patrons can rely on accurate and polished information. These tools play a key role in maintaining the integrity of library resources and services.

Table - 7: Accessing Artificial Intelligence tools for patron experiences

S.No	Description	SDA	DA	NO	A	SA	M	SD	R
1.	Botsonic	65 (6.71%)	76 (7.85%)	94 (9.71%)	331 (34.19%)	402 (41.53%)	3.801	1.196	8
2.	QuickChat	95	59	75	332	407	3.927	1.273	3

		(9.81%)	(6.10%)	(7.75%)	(34.30%)	(42.05%)			
3.	Copyscape	96 (9.92%)	69 (7.13%)	83 (8.57%)	381 (39.36%)	339 (35.02%)	3.824	1.259	6
4.	Dante	69 (7.13%)	59 (6.10%)	89 (9.19%)	410 (42.36%)	341 (35.23%)	3.925	1.151	4
5.	AndiSearch	93 (9.61%)	85 (8.78%)	57 (5.89%)	421 (43.49%)	312 (32.23%)	3.800	1.248	9
6.	ChatPDF	72 (7.44%)	83 (8.57%)	79 (8.16%)	463 (47.83%)	271 (28.00%)	3.804	1.156	7
7.	Perplexity AI	68 (7.02%)	61 (6.30%)	86 (8.88%)	442 (45.66%)	311 (32.13%)	3.896	1.134	5
8.	AudioPen	87 (8.99%)	94 (9.71%)	67 (6.92%)	397 (41.01%)	323 (33.37%)	3.960	1.250	2
9.	Grammarly	71 (7.33%)	93 (9.61%)	56 (5.79%)	331 (34.19%)	417 (43.08%)	3.961	1.238	1
10.	Quillbot	84 (8.68%)	93 (9.61%)	83 (8.57%)	400 (41.32%)	308 (31.82%)	3.780	1.234	10

Patron experiences-based AI tools for in library service 'Grammarly' as the first preference and 'AudioPen' as the second preference. The faculty agreed with the opinion 'Quillbot' to use AI in library services as the last preference indicated by them. The mean value of the variable range between 3.780 to 3.961, the standard deviation range between 1.134 to 1.273.

Future Study

Based on the findings of this study, several avenues for future research can be considered:

The study focuses on 20 educational institutions in Dindigul district, but could be expanded to include a larger geographical region or institutions with different specializations. Future research could explore AI usage and preferences in library services across different disciplines, such as technical or medical colleges. The study also highlighted the need for better AI integration in data analytics for library decision-making processes, benefiting both faculty and students. Faculty training and AI integration could be assessed to improve comfort and efficiency with AI applications. Future research could also investigate the impact of AI on library staff and resource management, and whether AI contributes to improved organizational operations. An in-depth qualitative study could explore faculty members' perceptions and experiences with AI tools in library services, leading to targeted improvements in AI applications. Specific AI tools like 'Endnote' and 'Grammarly' could be investigated to enhance library services quality and compare their effectiveness in specific contexts. A longitudinal study could track the evolution of AI usage in library services over time, assessing the long-term impact on library operations, user satisfaction, and faculty performance.

Conclusion

The study explores faculty members' preferences for AI tools in library services. It finds that AI tools are highly useful, especially in data analytics and decision-making. However, there is resistance to AI tools like 'AI Improved Efficiency'. Faculty members prioritize technological constraints and theoretical

background when selecting AI tools, preferring those that enhance communication, automate processes, and optimize collection management. Tools like 'Endnote,' 'Grammarly,' and 'AudioPen' are favored, reflecting a growing interest in AI's ability to improve academic research, writing, and patron experiences. AI has the potential to transform academic libraries by making them more competent, user-friendly, and data-driven. It can enhance information reclamation; facilitate information sharing among users, and foster interdisciplinary collaborations. While some view AI as a threat to librarians' jobs, it presents an opportunity to elevate their roles and better serve their communities. The successful implementation of AI tools will require addressing faculty concerns, offering specialized training, and continuously evaluating their effectiveness to ensure alignment with institutional goals and faculty preferences.

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