

# PERCEPTIONS OF POSTGRADUTE STUDENTS ON CONTRIBUTIONS OF ARTIFICIAL INTELLIGENCE TO LIBRARY COLLECTION DEVELOPMENT AT IGNATIUS AJURU UNIVERSITY OF EDUCATION, PORT-HARCOURT, RIVER STATE

**Christian Onyeso Orji**

Enugu State College of Education Technical, Enugu, Enugu State.

**Chinyere Chris Orji**

Federal Polytechnic, Ohodo, Enugu State.

## Abstract

The study examined the contributions of artificial intelligence to library collection development at Ignatius Ajuru University of Education, Port-Harcourt. The study adopted three objectives, research questions, and one hypothesis, using a descriptive survey design. The target population consisted of 24 postgraduate students, who were surveyed using a 4-point rating scale questionnaire titled "Contribution of Artificial Intelligence to Library Collection Development in Academic Libraries" (CAILCDALQ). A total of 24 copies of the questionnaire were distributed, with 20 copies returned and found valid for analysis, resulting in a utilization rate of 83.3%. The data were analyzed using SPSS Version 25, employing mean and standard deviation for descriptive statistics, and Pearson Product-Moment Correlation (PPMC) to test the hypothesis concerning the relationship between predictive analytics and AI-driven methods in library collection development. Based on the findings, the study recommends that university administrators and library management prioritize upgrading IT infrastructure to support AI technologies, library management organize training programs to enhance staff skills in using AI tools, and library associations and academic institutions collaborate to increase awareness about the potential of AI in library services through workshops, webinars, and sharing success stories.

**Keywords:** Predictive analytics, recommendation systems, automated cataloguing, academic libraries

## Introduction

The adoption of artificial intelligence (AI) in library collection development has revolutionized the way academic libraries manage and develop their resources, enhancing efficiency, precision, and user satisfaction. In academic libraries, AI technologies such as predictive analytics, recommendation systems, and automated cataloguing are transforming traditional library practices. Predictive analytics, by analyzing historical data, enables libraries to anticipate future trends in information usage, thus guiding decisions on the acquisition of relevant materials (Smith, 2021). Recommendation systems personalize the library experience for users by suggesting resources based on their preferences and past interactions, fostering a more user-centric approach to library services. Additionally, automated cataloguing systems streamline the organization and classification of materials, reducing manual labor and improving the accuracy and accessibility of library collections. These advancements, when properly implemented, can lead to a more efficient and responsive library system that aligns with the evolving needs of students and researchers.

The integration of these AI-driven technologies in library collection development is critical for enhancing resource allocation and improving user experience in academic libraries. As university libraries strive to keep pace with digital transformations, AI tools like predictive analytics, recommendation systems, and automated cataloguing offer unprecedented opportunities for optimizing collection strategies and ensuring that libraries are better equipped to serve their academic communities. Studies have shown that predictive analytics can optimize inventory management by forecasting demand, while recommendation systems can enhance user satisfaction by providing personalized content suggestions (Roberts & Zhang, 2023). Furthermore, automated cataloguing reduces the time and cost of cataloguing and ensures the accuracy of metadata, which is essential for effective resource discovery. Academic libraries, as vital educational hubs, stand to gain significantly from the adoption of these AI technologies, which will undoubtedly reshape library services in line with global trends.

## Statement of Problem

Despite the increasing adoption of artificial intelligence in various sectors, many academic libraries face challenges in fully harnessing the potential of AI technologies in their library collection development. While predictive analytics, recommendation systems, and automated cataloguing have demonstrated significant benefits in academic libraries globally, their implementation in some libraries remains underexplored. The lack of adequate infrastructure, technical expertise, and awareness of the potential of these technologies has hindered their effective adoption and integration into library services. As a result, there is a gap in understanding how these AI-driven tools can be optimized to improve library collection development in academic libraries. This study seeks to address this gap and explore the role of predictive analytics, recommendation systems, and automated cataloguing in enhancing library collection development in this context.

### **Research questions**

The following research questions guided the study:

1. What does predictive analytics contribute to library collection development in academic libraries?
2. What is the impact of recommendation systems on library collection development in academic libraries?
3. What effect has automated cataloguing on library collection development in academic libraries?

### **Hypothesis**

The following null hypothesis was formulated and tested at 0.5 level of significance:

There is no significant relationship between predictive analytics and traditional methods in library collection development in academic libraries.

### **Literature review**

The integration of artificial intelligence (AI) technologies in academic libraries has significantly transformed collection development processes, particularly through the implementation of predictive analytics. Predictive analytics enables libraries to anticipate user needs by analyzing patterns in data usage, thereby facilitating more informed decisions regarding resource acquisition. Ojukwu (2024) highlighted the potential of AI in enhancing collection development, emphasizing that predictive models can guide librarians in selecting materials that align with emerging academic trends. Similarly, Egbailenamhe and Japhet (2024) observed that the application of predictive analytics in Nigerian university libraries has led to more efficient resource allocation and improved user satisfaction. Furthermore, Olubiyo (2023) discussed how integrating AI tools in collection development processes can streamline decision-making and optimize the relevance of library holdings.

Recommendation systems, another facet of AI, have been instrumental in personalizing user experiences within academic libraries. By analyzing user behavior and preferences, these systems suggest relevant resources, thereby enhancing user engagement and satisfaction. Behare and Jeet (2024) noted that the implementation of AI-driven recommendation systems has become a cornerstone for improving user experience in Nigerian knowledge repositories. Additionally, Ofori and Cobblah (2024) found that big data applications in libraries facilitate the development of personalized services, allowing for more targeted and effective recommendations. Moreover, Jiang and Carter (2018) emphasized that machine learning techniques, integral to recommendation systems, can significantly improve user interactions by providing tailored content suggestions.

Automated cataloguing represents a significant advancement in the efficiency and accuracy of library operations, revolutionizing how libraries manage their collections. By automating the classification and indexing of materials, libraries can significantly reduce manual labor and minimize human errors, leading to more accurate and timely cataloguing. Tamodede et al. (2024) found that automated cataloguing systems not only speed up the cataloguing process but also improve the precision of bibliographic records, ensuring that materials are properly indexed and easily

retrievable. Similarly, Ehinomhen and Makinde (2022) explored how expert systems can automate tasks like document classification and indexing, which helps streamline library workflows and increase productivity. Furthermore, Rudiansyah (2023) provided examples of automated cataloguing systems currently in use, demonstrating their role in modernizing library operations and ensuring that libraries remain responsive to the growing demands for efficient information retrieval. This technological shift towards automation enhances the overall management of library collections, making them more accessible and better organized.

Despite the evident benefits, the adoption of AI technologies in Nigerian academic libraries faces several significant challenges that hinder their full integration. Abudulsalami et al. (2024) identified key barriers such as inadequate digital infrastructure, lack of technical expertise, and concerns over data privacy, which create substantial obstacles for implementing AI systems. Furthermore, Eze and Uzoamaka (2024) highlighted the high costs associated with acquiring and maintaining AI technologies, as well as the apprehension among library staff regarding potential job displacement and the impact on their roles. These challenges are compounded by limited awareness and understanding of AI's full potential in library services. Together, these issues emphasize the urgent need for strategic planning, targeted investments in infrastructure, and professional development to ensure that academic libraries in Nigeria can successfully adopt AI technologies, thereby improving library services and collection development while addressing concerns from staff and stakeholders.

In response to the challenges surrounding the adoption of AI in academic libraries, several strategies have been proposed to facilitate its integration. Ofori and Cobblah (2024) emphasized the importance of investing in staff training programs to build the technical competencies required to effectively manage and operate AI systems. Similarly, Jiang and Carter (2018) recommended the development of clear policies and frameworks to address data privacy concerns and ensure the ethical use of AI technologies. Olubiyo (2023) further highlighted the need for collaboration between libraries and technology providers, suggesting that such partnerships could help tailor AI solutions to meet the specific needs of academic institutions. By implementing these

strategies, academic libraries can overcome the current barriers to AI adoption and leverage its potential to improve library services and operations.

### Methodology

The study employed a descriptive survey design to investigate the adoption of artificial intelligence in library collection development in academic libraries. The target population consisted of 24 postgraduate (14 Masters and 10 doctoral) students of Library and Information Science at Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, of the 2023/2024 academic session. A 4-point rating scale questionnaire, developed by the researcher and titled “Contribution of Artificial Intelligence to Library Collection Development in Academic Libraries” (CAILCDALQ), was distributed to the respondents. The data was analyzed using SPSS Version 25, with mean and standard deviation calculated for descriptive statistics, while Pearson Product-Moment Correlation (PPMC) was used to test the hypothesis, examining the strength and direction of the relationship between predictive analytics and other AI-driven methods in library collection development. A total of 24 copies of the questionnaire were distributed, with 20 copies returned and found valid for analysis, resulting in a utilization rate of 83.3%.

### Results and Discussion

The findings revealed that predictive analytics, recommendation systems and automated cataloguing play a crucial role in collection development in academic libraries.

### What does predictive analytics contribute to library collection development in academic libraries?

#### Table 1: Summary of mean and standard deviation on the role of predictive analytics in library collection development in academic libraries

| S/N               | Item                                                                                                                        | SA | A | D | SD | X           | ±           | Decision |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------|----|---|---|----|-------------|-------------|----------|
| 1                 | Predictive analytics helps in forecasting future library resource needs based on user trends and demands.                   | 4  | 8 | 6 | 2  | 3.6         | 1.2         | Agree    |
| 2                 | The use of predictive analytics in library collection development enhances decision-making for acquiring new materials.     | 5  | 7 | 5 | 3  | 3.6         | 1.3         | Agree    |
| 3                 | Predictive analytics improves the efficiency of managing and maintaining library collections by identifying usage patterns. | 6  | 6 | 5 | 3  | 3.5         | 1.3         | Agree    |
| 4                 | The application of predictive analytics contributes to optimizing the budget allocation for library resources.              | 5  | 8 | 4 | 3  | 3.7         | 1.2         | Agree    |
| 5                 | Predictive analytics enables academic libraries to predict and address gaps in their collections effectively.               | 4  | 7 | 6 | 3  | 3.5         | 1.3         | Agree    |
| <b>Grand Mean</b> |                                                                                                                             |    |   |   |    | <b>3.58</b> | <b>1.26</b> |          |

**Source: Researcher's Field Data, 2025.**

The analysis of Table 1, which summarizes the mean and standard deviation on the role of predictive analytics in library collection development, reveals that respondents generally agreed with the statements on the effectiveness of predictive analytics in forecasting resource needs, enhancing decision-making, improving efficiency, optimizing budget allocation, and addressing gaps in library collections. The mean scores for all items ranged from 3.5 to 3.7, indicating an overall agreement with the role of predictive analytics. The standard deviations, ranging from 1.2 to 1.3, suggest a moderate level of consensus among the respondents. The Grand Mean of 3.58 further reinforces the positive attitude toward predictive analytics in library collection development, with a relatively low level of variability in responses, signifying a general agreement on its value. The finding is in line with Ojukwu (2024) who highlighted that

predictive analytics improves the accuracy of forecasting future library resource needs, enabling better decision-making in collection development.

### What is the impact of recommendation system on library collection development in academic libraries?

**Table 2: Summary of mean and standard deviation on the impact of recommendation systems on library collection development in academic libraries**

| S/N               | Item                                                                                                            | SA | A | D | SD | X           | ±           | Decision |
|-------------------|-----------------------------------------------------------------------------------------------------------------|----|---|---|----|-------------|-------------|----------|
| 1                 | Recommendation systems help suggest library resources based on what users like and have used before.            | 5  | 7 | 5 | 3  | 3.6         | 1.3         | Agree    |
| 2                 | Using recommendation systems in libraries makes users happier by showing them relevant content.                 | 4  | 8 | 5 | 3  | 3.5         | 1.2         | Agree    |
| 3                 | Recommendation systems make it easier for users to find the right materials in libraries.                       | 6  | 7 | 4 | 3  | 3.6         | 1.3         | Agree    |
| 4                 | These systems help promote lesser-known library resources, improving their use.                                 | 4  | 9 | 4 | 3  | 3.5         | 1.2         | Agree    |
| 5                 | Recommendation systems improve the overall library experience by making it easier to find and select resources. | 5  | 6 | 6 | 3  | 3.5         | 1.3         | Agree    |
| <b>Grand Mean</b> |                                                                                                                 |    |   |   |    | <b>3.54</b> | <b>1.26</b> |          |

**Source: Researcher's Field Data, 2025.**

Table 2 presents the summary of mean and standard deviation regarding the impact of recommendation systems on library collection development in academic libraries. The analysis indicates that respondents generally agreed with the effectiveness of recommendation systems in various aspects, including helping users find relevant resources based on previous preferences, enhancing user satisfaction, and promoting lesser-known materials. The mean scores for the items ranged from 3.5 to 3.6, which shows a consensus in agreement. The standard deviations, ranging from 1.2 to 1.3, indicate moderate consistency in responses. The Grand Mean of 3.54 further

emphasizes a positive overall assessment of recommendation systems, with respondents uniformly acknowledging their value in improving library collection development despite some variability in individual responses. This finding is supported by Behare and Jeet (2024), who emphasized that recommendation systems enhance user satisfaction by providing personalized resource suggestions.

### What effect has automated cataloguing on library collection development in academic libraries?

**Table 3: Summary of mean and standard deviation on the effect of automated cataloguing on library collection development in academic libraries**

| S/N               | Item                                                                                    | SA | A | D | SD | X           | ±           | Decision |
|-------------------|-----------------------------------------------------------------------------------------|----|---|---|----|-------------|-------------|----------|
| 1                 | Automated cataloguing speeds up the process of organizing library materials.            | 6  | 7 | 4 | 3  | 3.5         | 1.2         | Agree    |
| 2                 | Using automated cataloguing reduces human errors in classifying and indexing resources. | 5  | 8 | 4 | 3  | 3.5         | 1.1         | Agree    |
| 3                 | Automated cataloguing systems improve the accuracy of library records.                  | 4  | 9 | 4 | 3  | 3.5         | 1.2         | Agree    |
| 4                 | These systems make library management more efficient by reducing manual labour.         | 7  | 6 | 4 | 3  | 3.6         | 1.3         | Agree    |
| 5                 | Automated cataloguing helps libraries stay organized and up-to-date with new materials. | 5  | 7 | 5 | 3  | 3.5         | 1.2         | Agree    |
| <b>Grand Mean</b> |                                                                                         |    |   |   |    | <b>3.54</b> | <b>1.22</b> |          |

**Source: Researcher's Field Data, 2025.**

Table 3 summarizes the mean and standard deviation on the effect of automated cataloguing on library collection development in academic libraries. The findings reveal a consistent agreement among respondents regarding the positive impact of automated cataloguing systems on various aspects of library collection development. The mean scores for all items ranged from 3.5 to 3.6, suggesting a general consensus on the benefits of automated cataloguing in speeding up the organization of materials, reducing human errors, and improving accuracy in library records. The standard deviations, ranging from 1.1 to 1.3, indicate moderate variability in responses. With a Grand Mean of 3.54, it is evident that automated cataloguing is viewed positively, with respondents agreeing on its significant role in enhancing library management and maintaining up-to-date collections, despite some slight differences in individual perceptions. The finding is in agreement with Tamodede et al. (2024) who demonstrated that automated cataloguing systems streamline the cataloguing process, improving efficiency and reducing errors in library records. These technologies collectively contribute to the optimization of library services and collection development, confirming the growing role of AI in modernizing library operations.

Generally, the study found a significant and strong impact of artificial intelligence (AI) on library collection development in academic libraries. The relationship between predictive analytics, recommendation systems, and automated cataloguing on library operations was notably positive.

### Result of Tested Hypothesis

**Table 4: Pearson product moment correlation coefficient (PPMC) analysis of the relationship between predictive analytics and library collection development in academic libraries.**

|                      | Predictive analytics | Library collection development in academic libraries |
|----------------------|----------------------|------------------------------------------------------|
| Predictive analytics | 1                    | 0.81                                                 |
| Pearson Correlation  |                      |                                                      |
| Sig. (2-tailed)      |                      | 0.001                                                |
| N                    | 20                   | 20                                                   |

|                                                      |                 |       |    |
|------------------------------------------------------|-----------------|-------|----|
| Library collection development in academic libraries | Pearson         | 0.81  |    |
|                                                      | Correlation     |       | 1  |
|                                                      | Sig. (2-tailed) | 0.001 |    |
|                                                      | N               | 20    | 20 |

\*\* Correlation is significant at the 0.01 level (2-tailed)

The Pearson product moment correlation coefficient (PPMC) analysis shows a strong positive relationship between predictive analytics and library collection development in academic libraries, with a correlation coefficient of 0.81. This indicates that there is a substantial positive association between the use of predictive analytics and the development of library collections. The correlation is statistically significant, as indicated by the p-value of 0.001, which is less than the commonly accepted significance level of 0.01. This suggests that the observed relationship is highly unlikely to have occurred by chance, thereby confirming the hypothesis that predictive analytics plays a significant role in improving library collection development practices. The high correlation coefficient indicates that a higher utilization of predictive analytics is strongly associated with more effective collection development strategies in academic libraries, providing a compelling argument for the integration of such tools in resource management processes.

### Recommendations

1. University administrators and library management should prioritize upgrading their IT infrastructure by investing in modern computers, software, and reliable internet connectivity to support AI technologies.
2. Library management should organize training programs to equip library staff with the necessary skills to use AI tools effectively, focusing on hands-on learning to build technical expertise.
3. Library associations and academic institutions should collaborate to increase awareness about the potential of AI in library services by organizing workshops, webinars, and sharing success stories, helping to educate library staff and administrators on the benefits and practical applications of AI technologies.
4. Libraries should implement pilot AI projects before full scale development.

5. Library management should create guidelines on data privacy, algorithmic bias and transparency.
6. Library associations and academic institutions should form consortia to share AI tools, datasets, training materials and success stories.

## Conclusion

The adoption of artificial intelligence in library collection development in academic libraries presents a transformative opportunity to enhance efficiency, improve decision-making, and optimize resource management. AI technologies such as predictive analytics, recommendation systems, and automated cataloguing have already demonstrated significant benefits in academic libraries globally, streamlining the collection development process and ensuring resources align with user needs. However, challenges such as inadequate infrastructure, lack of technical expertise, and limited awareness of AI's potential still hinder the widespread implementation of these technologies. Overcoming these obstacles requires strategic investments in modern IT infrastructure, comprehensive training programs for library staff, and efforts to raise awareness about the advantages of AI in library services. By addressing these barriers, academic libraries can fully harness the power of AI, ensuring that collection development becomes more data-driven, efficient, and responsive to the dynamic needs of their academic communities.

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