

# PREPAREDNESS AND ADAPTATION OF LIBRARIANS IN THE COLLEGE OF EDUCATION LIBRARIES IN SOUTHWEST NIGERIA WITH THE 5TH INDUSTRIAL REVOLUTION

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## Abstract

*This study investigated the preparedness and adaptability of librarians in colleges of education within the context of the 5th Industrial Revolution. The research was driven by the growing use of technologies such as artificial intelligence (AI), Internet of Things (IoT), FRID systems, and smart devices that are transforming routine and library information service delivery. The researchers employed a descriptive survey research design and sampled librarians from various colleges of education using a two-stage sampling technique. Three institutions were selected: Federal College of Education, Abeokuta, Ogun State (29 respondents); Federal College of Education (Special), Oyo (53 respondents); and Federal College of Education (Technical), Akoka, Lagos State (18 respondents). The study included all 100 librarians and senior library staff due to the manageable population size. Data were analyzed and interpreted using SPSS version 24, with results presented in terms of simple percentages, means, standard deviations, and correlations. The findings reveal that librarians are aware of the impact of the 5th Industrial Revolution on library service delivery, as indicated by a grand mean of 3.01. Furthermore, the results suggest that librarians in colleges of education in Southwest Nigeria are well adapted to the use of 5IR, with a grand mean of 2.96. The study concludes that respondents are well-prepared and effectively adapted to utilizing 5IR technologies. However, inadequate ICT tools and limited resources remain barriers to full adaptation, reflected by a grand mean of 2.49. The study recommends that continuous professional development is essential for librarians to keep pace with emerging information trends and technological advancements in the era of the 5th Industrial Revolution.*

**Keyword:** Preparedness, Adaptation, 5<sup>th</sup> Industrial Revolution, Librarian, College of Education

## Introduction

The advancements brought about by the 5th Industrial Revolution (5IR) significantly benefit the profession of librarianship. The transformative impact of 5IR has been felt across all sectors, including engineering, agriculture, journalism, politics, and education, leading to substantial improvements in routines and service delivery.

The proliferation of diverse emerging technologies that are reshaping traditional practices distinguishes the 5IR era. Artificial intelligence (AI) has introduced intelligent machines and smart devices capable of human-like thinking, exemplified by tools such as ChatGPT, chatbots, QuillBot, Grammarly, Scite, and the use of drones. Additionally, the Internet of Things (IoT) enables devices to connect, communicate, and share data autonomously, further enhancing efficiency and innovation without the need for direct human intervention.

According to Pandin (2021), the shift from predominantly agrarian economies to industrialized, machine-powered manufacturing marks a pivotal moment in human history. In the era of the 5th Industrial Revolution (5IR), machines have become increasingly intelligent and sophisticated, capable of receiving sensory data, processing information, understanding contexts, and communicating with other intelligent devices. As a result, industrial labor has become less reliant on human input.

However, librarians in educational institutions can capitalize on the opportunities presented by the 5IR only if they are ready and adaptable. As Baker (2002) notes, an individual's aptitude and willingness to perform tasks or fulfill professional responsibilities with ease are key indicators of preparedness within an educational setting.

The present technical skills, digital literacy, data analysis, interpretation, and knowledge awareness in the emerging technologies coupled with the 5th industrial revolution are indicators that libraries and librarians in colleges of education are fully prepared for the 5th Industrial Revolution. The use of new technologies (such as AI-powered tools and the integration of IoT devices like RFID tags, RFID doors, smart shelves, and sensors, such as smoke detectors and smart closed-circuit television) is necessary to adapt to the 5th Industrial Revolution.

A previous study conducted by Arief, Nur, Yohannes, and Lucia (2025) focused on a systematic literature review of digital skills and human resource readiness for the Industrial Revolution eras 4.0 and 5.0. The study pointed out digital skills as a determining factor for readiness and adaptation to 5IR technologies such as data literacy, information technology proficiency, and problem-solving abilities, which are key factors for users of the 5th industrial revolution technologies. The digital skills that librarians in colleges of education have gained in the past are the main driving force for fitting into the 5IR. This knowledge offers people the assurance that, regardless of how complicated the new technology may be, they will perceive it unambiguous to use. However, when routines and service delivery grow higher, the advantages associated with the 5IR become a reality.

The library routines and services, such as translation services, user statistics, virtual reference services, user check-in and check-out, charging and discharging of books, monitoring of the library environment, and digital collections or repositories, could be deployed with less effort required of librarians in colleges of education only if the adequate skills required to fully fit into the 5IR have been acquired and deployed for use. But based on my observations of certain librarians at colleges of education, some of them are unprepared for the 5IR age and are still unready to adjust to the 5IR in their individual college libraries. These barriers may include fear of utilizing developing technologies, insufficient training on 5IR emerging technologies, and a lack of understanding of the need to adapt to the 5IR era.

### **Objective of the study**

1. To find out the preparedness of librarians in colleges of education in 5IR, Southwest, Nigeria
2. To examine the adaptation of librarians in colleges of education in 5IR, Southwest, Nigeria
3. To determine the challenges in preparedness and adaptation of librarians in the 5IR in Southwest Nigeria.

### **Research Questions**

1. What is the level of preparedness of librarians in colleges of education in 5IR, Southwest, Nigeria?
2. What is the level of adaptation of librarians in colleges of education in 5IR, Southwest, Nigeria?
3. What are the challenges in preparedness and adaptation of librarians in the 5IR in Southwest Nigeria?

### **Literature Review**

It is believed that change is a continual occurrence that will impact all aspects of existence. One of the key factors influencing changes in businesses and society overall is the exponential transformation of our planet brought about by the 5th Industrial Revolution (5IR). As an information hub, the library is not exempt from the changes brought about by

5IR, which have changed traditional library procedures and service delivery and reduced the amount of work that librarians must undertake.

The 5th Industrial Revolution is a smart industrial era where smart devices, intelligent machines, and connected things replace the manual labour of carrying out routines and tasks in sectors such as engineering, agriculture, journalism, and entertainment that are integrated into the era. Smart gadgets, or intelligent machines that think and sense like people, define this era. Without human intervention, these smart devices gather, process, and interpret data as well as communicate with other smart devices.

The study conducted by Ekwueme, Oluwaseun, Ajie, Ofodu, and Ambrose (2024) titled "Empowering librarians in the Fifth Industrial Revolution: navigating skills, challenges, and strategies for effective library services delivery in open distance learning" explores the critical role of librarians in adapting to the evolving demands of the fifth industrial revolution (5IR). The study was a descriptive survey design, and total enumeration was adopted to sample 60 librarians at the National Open University of Nigeria. The study data were collected using Google Forms questionnaires sent to librarians via email and WhatsApp, respectively. The mean score and standard deviation indicated that the provision of library services ranged from 3.64 (0.484) to 3.00 (0.798). The study participants confirmed that they possessed the skills and competencies required to apply and fit into the 5IR. The study's findings demonstrated how ready they were to improve library operations and service delivery in both open and distance learning by utilizing 5IR technologies, including artificial intelligence, the Internet of Things, and smart equipment to navigate the new information era. Carpathian (2024) opined that for librarians to ensure satisfaction is attained by their users in both open and distance learning contexts, they must be savvy (adept at leveraging) digital resources, databases, and information systems to make rational decisions and improve inclusive service. To increase their effectiveness, efficiency, and productivity level, the majority of library patrons in modern libraries employ Artificial Intelligence (AI) applications for assignments and research, such as ChatGPT, chatbots, Grammarly, OpenAI, Scite, and the like. This is a challenge to all information workers to be knowledgeable about the technologies of the 5th Industrial Revolution.

In a study titled "Opportunities and Challenges of AI-Driven Customer Service," Chaturvedi and Verma (2023) explored the impact of AI on customer service. The researcher suggested that AI and machine learning have assumed central roles in libraries' adaptation to the 5th Industrial Revolution, with these technologies instrumental in revolutionizing cataloguing, information retrieval, and user interactions. AI-driven virtual assistants, chatbots, and recommendation algorithms are enhancing user experiences and providing personalized and efficient library service delivery.

In the era of 5IR, Abata-Ebire, Adetayo, and Babarinde (2023) observe that higher education institutions face pressure to adapt their curricula, pedagogies, and learning environments to equip students with the skills and competencies needed to thrive in a rapidly changing world. This propels higher education institutions to ensure their curricula remain relevant and prepare graduates for the evolving needs of the job market and society. This includes incorporating new knowledge, skills, and technologies into the curriculum. Libraries in colleges of education also conform to changes in the curriculum and evolve their routines and service delivery to meet the ever-changing needs of their users. The level of their ability and willingness to perform virtual reference services and insert RFID tags to monitor the movement of books within the library is incontestable.

Oladokun and Mooko (2023) conducted a study on academic libraries and the need for continuing professional development in Botswana. The researchers adopted a positivist approach and collected quantitative data using the census method. The study's findings established that there had been significant changes in the librarians' jobs over the years and

also noted that librarians were lagging in their knowledge of operating information technology and other relevant tasks. This trend was evident during the COVID-19 pandemic, as many informational professionals could not offer virtual reference services.

Furthermore, Oladokun et al. (2023) reported that librarians seek opportunities to collaborate with academic institutions, technology companies, community organizations, and government agencies to leverage collective expertise and resources. The deployment of emerging technologies such as Artificial Intelligence, the Internet of Things, Radio Frequency Identification doors or tags in books, and other sensors in the library is crucial to the library routines and service delivery for library users to be relevant and up to the task before library users. Regular training and seminars on using 5IR technologies in the library would help them adapt to changes in how information is accessed, processed, shared, and preserved.

Dermawan, Wening, Vemberi, and Fitriastuti (2025) conducted a study titled “A Systematic Literature Review of Digital Skills and Human Resource Readiness for the Industrial Revolution Eras 4.0 and 5.0.” The study suggested that the readiness of Human Resources (HR) to adopt advanced technologies and human-centric approaches in the Industrial Revolution 4.0 and 5.0 eras depends on their willingness to acquire new skills and adapt to rapid transformations. Organizational readiness and access to technology-based training significantly influence HR's success. This change could positively impact librarians in colleges of education, but only if they are willing to accept new technology, acquire new skills, and adapt to the rapid transformations brought by the 5th Industrial Revolution (5IR) in their daily routines and service delivery.

The 5th Industrial Revolution (5IR) era, embedded with the integration of emerging technologies such as artificial intelligence, robotics, and the Internet of Things (IoT), has been hindered by many factors. Lo (2023) reported in a study that the cost or funding of acquiring artificial intelligence tools is exorbitant and thus hindering the implementation in the library. However, Onwueme and Nyemezu (2017) suggested that for libraries to acquire sophisticated emerging technologies and enjoy top-notch services and satisfactory user experiences, it is necessary to seek funding assistance from every available opportunity.

In a desk study, Ajani et al. (2022) highlighted the challenges faced by libraries in developing nations regarding the implementation of new technologies. One significant issue is power generation, which impacts the libraries' ability to prepare for and adapt to technological advancements. To address this challenge, the authors suggested that libraries develop alternative power sources, such as solar energy or biofuels, as a sustainable and permanent solution.

The theoretical framework of this study provides a logical structure for understanding the key factors relevant to the research problem. Guided by Self-Determination Theory (SDT), as described by Legault (2017), the study examines how individual motivation and personality are shaped by interactions with the social environment. Deci and Ryan first introduced SDT in their book, *Self-Determination and Intrinsic Motivation in Human Behavior*. This macro theory posits that individuals have three fundamental psychological needs: relatedness (feeling connected to others), competence (feeling effective in one's environment), and autonomy (feeling in control of one's actions) (Legault, 2017).

These three components of SDT are particularly relevant to librarians in colleges of education as they deal with the difficulties of the Fifth Industrial Revolution (5IR). Autonomy enables librarians to choose whether to engage with emerging technologies such as artificial intelligence, robotics, and the Internet of Things, ensuring they remain current with advancements in information acquisition, access, processing, and dissemination. Competence

reflects the ability of librarians to independently operate these technologies, which directly impacts their effectiveness in adapting to the 5IR era. Relatedness promotes community and collaboration, further supporting adaptation and innovation.

Ryan (2023) emphasized that SDT has been instrumental in fostering higher-quality motivation, engagement, and satisfaction across various domains, including education, business, sports, and healthcare. For librarians, applying SDT can enhance effectiveness, efficiency, confidence, and satisfaction in their professional roles. It also emphasizes the necessity of preparing and guiding library users to adapt to the technological demands of the 5IR era.

### Methodology

This study investigated the preparedness and adaptability of librarians in colleges of education within the context of the 5th Industrial Revolution. To ensure content validity, the questionnaire drafts were evaluated by two lecturers specializing in educational media technology and computer science at the College of Education, Abeokuta. The feedback provided by these experts was utilized to further refine the instrument. A pretest was subsequently conducted using twenty (20) copies of the questionnaire at the Tai Solarin College of Education in Omu-Ijebu to assess the reliability of the research instrument. The reliability analysis produced a Cronbach's alpha coefficient of 0.77, indicating a high level of reliability.

The study employed a descriptive survey research design, with samples drawn from the population of librarians in colleges of education. A two-stage sampling technique was adopted. Three colleges of education were selected: Federal College of Education, Abeokuta, Ogun State (29 respondents); Federal College of Education (Special), Oyo (53 respondents); and Federal College of Education (Technical), Akoka, Lagos State (18 respondents). The study included all 100 librarians and senior library staff due to the manageable population size. Data collected were presented using simple percentages, means, standard deviations, and correlations and were analyzed and interpreted using SPSS version 24.

### Results

**Table 1. Preparedness of Librarians in the 5th Industrial Revolution**

| S/N | ITEMS                                                                                                             | SA | A  | D  | SD | Mean |
|-----|-------------------------------------------------------------------------------------------------------------------|----|----|----|----|------|
| 1   | I am familiar with the concept of the 5th Industrial Revolution?                                                  | 10 | 75 | 12 | 3  | 2.92 |
| 2   | I have received training or development programs on use of emerging technologies such as AI, CCTV, Sensors, RFID. | 8  | 75 | 14 | 3  | 2.88 |
| 3   | How confident are you in using digital tools and technologies                                                     | 8  | 85 | 3  | 4  | 2.97 |
| 4   | How aware are you of the impact of the 5th Industrial Revolution on libraries.                                    | 10 | 70 | 12 | 8  | 2.82 |
| 5   | I feel a sense of control over my work as a librarian in the 5IR.                                                 | 10 | 90 | -  | -  | 3.10 |
| 6   | I have the freedom to make decisions about how to adapt to new technologies and trends in librarianship.          | 10 | 90 | -  | -  | 3.10 |
| 7   | I feel prepared to adapt to the changes brought about by the 5th industrial revolution.                           | 15 | 85 | -  | -  | 3.15 |
| 8   | I am actively seeking out opportunities to learn and adapt                                                        | 15 | 85 | -  | -  | 3.15 |

|  |                                                  |  |  |  |  |             |
|--|--------------------------------------------------|--|--|--|--|-------------|
|  | to new technologies and trends in librarianship. |  |  |  |  |             |
|  | <b>Grand Mean</b>                                |  |  |  |  | <b>3.01</b> |

The results of the analysis in Table 1 indicated a grand mean of 3.01, which is above the average mean value of 2.50 for a five-point Likert scale. This implies that librarians in Colleges of Education in the southwest of Nigeria are well prepared for 5IR. Assessments of the responses showed that the majority of the respondents were actively seeking out opportunities to learn and adapt to new technologies and trends in librarianship (=3.15). These were closely followed by the respondents who feel a sense of control over their work as a librarian in the 5IR, with a (=3.10). Interpretation of these results led to the conclusion that the respondents are adequately prepared for the 5th Industrial Revolution.

**Table 2. Adaptation of Librarians in the 5th Industrial Revolution**

| S/N | ITEMS                                                                                                           | SA | A  | D  | SD | Mean        |
|-----|-----------------------------------------------------------------------------------------------------------------|----|----|----|----|-------------|
| 1   | I have fully adopted emerging technologies in my library such as ChatGPT, Chatbots, Grammarly, Scite etc        | 25 | 60 | 10 | 5  | 3.05        |
| 2   | I do stay updated on the latest trends and innovations in librarianship.                                        | 10 | 90 | -  | -  | 3.10        |
| 3   | I have developed new services or programs in response to the 5th Industrial Revolution                          | 2  | 80 | 10 | 8  | 2.76        |
| 4   | My adaptation to the 5th Industrial Revolution has made my routines and services more effective and efficient.  | 25 | 70 | 3  | 2  | 3.18        |
| 5   | I feel confident in my ability to learn and adapt to new technologies and trends in librarianship               | 10 | 90 | -  | -  | 3.10        |
| 6   | I have the necessary skills and knowledge to effectively adapt to the fifth industrial revolution.              | 5  | 60 | 20 | 15 | 2.55        |
| 7   | I feel connected to my colleagues and peers in the library field as we adapt to the fifth industrial revolution | 10 | 75 | 10 | 5  | 2.90        |
| 8   | I feel supported by my organization and colleagues as I adapt to new technologies and trends in librarianship   | 15 | 75 | 6  | 4  | 3.01        |
|     | <b>Grand Mean</b>                                                                                               |    |    |    |    | <b>2.96</b> |

The results of the analysis of data to answer research question 2 in table 2 showed a grand mean of 2.96, which is above the average value of 2.50 for a five-point Likert scale. This implies that librarians in colleges of education in the southwest of Nigeria are well adapted to the use of 5IR. My adaptation to the 5th Industrial Revolution has made my routines and services more effective and efficient (=3.18). These are closely followed by “I do stay updated on the latest trends and innovations in librarianship” (=3.10).

**Table 3. Challenges in preparedness and adaptation of Librarians in the 5IR**

| S/N | ITEMS                                                                                           | SA | A  | D  | SD | Mean (x) |
|-----|-------------------------------------------------------------------------------------------------|----|----|----|----|----------|
| 1   | Lack of digital literacy                                                                        | 10 | 40 | 30 | 20 | 2.40     |
| 2   | No adequate training is a barrier to adaptation of librarians to the 5th Industrial Revolution? | 20 | 30 | 20 | 30 | 2.40     |
| 3   | Inadequate ICT tools or limited resources are a barrier                                         | 38 | 22 | 30 | 10 | 2.88     |

|   |                                                                                               |    |    |    |    |             |
|---|-----------------------------------------------------------------------------------------------|----|----|----|----|-------------|
|   | to adaptation of librarians to the 5th Industrial Revolution                                  |    |    |    |    |             |
| 4 | Lack of support from administrators is a barrier to adapting to the 5th Industrial Revolution | 20 | 40 | 30 | 10 | 2.70        |
| 5 | I resist to change to the 5th industrial revolution emerging technologies.                    | 15 | 25 | 40 | 20 | 2.35        |
| 6 | I found it difficult to integrating new technologies into the existing system.                | 10 | 20 | 50 | 20 | 2.20        |
|   | <b>Grand Mean</b>                                                                             |    |    |    |    | <b>2.49</b> |

The results of data analysis in Table 3 revealed a grand mean of 2.49, which is slightly below the average mean value of 2.50 for a four-point Likert scale. This means that the preparation and adaptation of libraries in colleges of education in South-West, Nigeria to 5IR are slightly faced with some challenges. In other words, librarians in colleges of education in the Southwest encountered average or middle-level barriers in 5IR. Inadequate ICT tools or limited resources are a barrier to the adaptation of librarians to the 5th Industrial Revolution (2.88). The lack of adequate training serves as a barrier to librarians' adaptation to the 5th Industrial Revolution. (= 2.40). Assessing these factors could reveal resistance to the advancement of the 5th Industrial Revolution in colleges of education in southwest, Nigeria.

### Discussion of the Finding

The discussion section is organized around the key findings derived from the research questions. The study sample comprised participants from three selected colleges of education: Federal College of Education, Abeokuta, Ogun State (29 respondents); Federal College of Education (Special), Oyo (53 respondents); and Federal College of Education (Technical), Akoka, Lagos State (18 respondents).

Regarding the research question on the preparedness of librarians for the 5th Industrial Revolution, the findings indicate a strong agreement that librarians are well equipped to adapt to the changes introduced by this new era. The majority of respondents affirmed that they are proactively seeking opportunities to learn about and embrace new technologies and trends in librarianship. Additionally, the results indicate that librarians are cognizant of the impact that the 5th Industrial Revolution has on library services delivery. The evidence suggests that librarians are adequately prepared to meet the challenges and opportunities presented by the 5th Industrial Revolution.

Table 2 presents the analysis of data regarding librarians' adaptation to the 5th Industrial Revolution. The results show that most respondents agreed their routines and services have become more effective and efficient as a result of this adaptation. The findings further indicate that librarians and staff are consistently staying informed about the latest trends and innovations in librarianship. These results suggest that librarians in colleges of education in Southwest Nigeria have successfully adapted to the use of 5IR technologies. The high levels of agreement across these statements highlight the significant positive impact of technological adaptation on service delivery within these institutions.

The table highlights the challenges respondents encountered regarding the preparedness and adaptation of librarians to the 5th Industrial Revolution. The highest level of agreement was recorded for the statement, "Inadequate ICT tools or limited resources are a barrier to the adaptation of librarians to the 5th Industrial Revolution." The findings also reveal that a lack

of support from administrators and insufficient training are significant barriers to effective adaptation. These results suggest that addressing these challenges is essential for colleges of education in Southwest Nigeria to fully embrace the 5th Industrial Revolution and achieve optimal outcomes.

### **Recommendations**

The field of library administration is evolving in response to societal changes and technological advancements ushered in by the 5th Industrial Revolution (5IR). Librarians are strengthening their preparedness to effectively navigate the opportunities and challenges presented by 5IR during this period of rapid transformation. Based on these observations, this study recommends the following:

Librarians should actively participate in professional development activities, such as attending conferences, webinars, and seminars; pursuing advanced degrees or certifications; and utilizing online courses or self-directed learning opportunities. Continuous learning is crucial for librarians to stay abreast of emerging information trends and technological best practices in the era of the 5th Industrial Revolution.

By prioritizing ongoing skill and knowledge development, librarians can effectively incorporate innovative techniques and resources into their practice, ensuring they remain flexible and responsive to the evolving needs of library patrons.

Additionally, to enhance their readiness for the 5th Industrial Revolution, it is essential for librarians to foster cooperation and collaboration with other organizations, institutions, and stakeholders. Working in partnership with government agencies, IT firms, community groups, and educational institutions enables the pooling of resources and expertise, leading to more effective outcomes.

Furthermore, to remain current and responsive to the needs of patrons in the 5th Industrial Revolution, it is essential for librarians to integrate emerging technologies into library service delivery. Librarians should explore and experiment with technologies such as blockchain, augmented reality, machine learning, and artificial intelligence. These efforts may include enhancing learning experiences, developing virtual reality environments, utilizing data analytics to streamline library operations, and improving personalized recommendation systems.

Building on the previous discussion, fostering an innovative culture within libraries is critical to enhancing librarians' readiness for the 5IR. This could involve establishing innovation laboratories or dedicated creative spaces within libraries, as well as offering courses on design thinking and related topics to encourage staff collaboration on innovative projects.

Undoubtedly, enhancing librarian readiness in the age of the 5th Industrial Revolution requires a proactive and comprehensive approach. By adopting these strategies, librarians can thrive in the rapidly evolving field of information management and ensure that libraries remain vibrant and relevant institutions in the digital era.

### **Conclusion**

The strategies presented to enhance librarians' readiness for the 5th Industrial Revolution (5IR) offer a proactive approach to addressing the challenges posed by the evolving landscape of information management. Drawing on the study's findings, the research

emphasizes the significance of collaboration, continuous professional development, technological integration, and the cultivation of an innovative culture as essential factors for librarians to thrive in the digital era. Preparedness for the 5IR is vital for librarians, as it empowers them to fulfill their roles as stewards of information ethics, promoters of digital literacy, and facilitators of knowledge access amidst the complexities of the digital age. In conclusion, the article underscores how librarians can adapt to and excel within the rapidly changing domain of information management and dissemination, thereby ensuring that their institutions remain dynamic and relevant in the digital era.

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