Empowering Librarians in the Fifth Industrial Revolution: Navigating Skills, Challenges, and Strategies for Effective Library Services in Open and Distance Learning

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Abstract
The study aimed at investigating librarians and the fifth industrial revolution skills, challenges, and strategies for effective library services delivery in an Open and Distance Learning. The research employed the descriptive survey design, and the entire population of sixty (60) librarians in National Open University of Nigeria was used. The Google Form questionnaire was used for the collection of data. The Google Form questionnaire was sent to all the librarians' email and in their WhatsApp group account. Forty-five (45) out of sixty (60) respondents filled the form correctly and submitted. The study utilized Statistical Packages for Social Sciences (SPSS) to analyse the responses, which were coded in a spread sheet. Many surveyed librarians affirmed their possession of the necessary skills and competencies to implement the 5th Industrial Revolution in library services provision, with mean scores and Standard Deviation (SD ranging from 3.64:0.484 to 3.00:0.798. Findings revealed that librarians exhibit collaborative and digital skills essential for working with both people and machines in delivering library services to learners. However, many respondents acknowledged that there are challenges associated with the implementation but agreed that improved power supply, continuous learning, training and retraining of librarians in conference and workshops to acquire necessary skills could be strategic factors for libraries to effectively implement the 5th Industrial Revolution and enhance library services delivery for their learners.

Keywords: *5th Industrial Revolution, Librarians, Library services, Skills, Open and Distance Learning.*

Introduction

The 5th Industrial Revolution (5th IR) marks a transformative period where information resources and services transition into a technologically driven format accessible anytime, anywhere through ICT devices. Libraries are adapting to incorporate advanced technologies and collaborative methods, with librarians playing a pivotal role in navigating these changes to deliver innovative and inclusive services to students in open and distance learning environments. The consistent demand for increased customisation and flexibility in information dissemination and services reflects positive changes in library activities driven by Information and Communication Technology (ICT), including the impact of the Industrial Revolution (IR) (Ziatdinov, Atteraya and Nabiyev, 2024). Pandin (2021) stated that the industrial revolution represents a pivotal transformation in human history, marking a shift from primarily agricultural-based economies to industrialized, machine-powered production. The Industrial Revolution, which began in the 19th-century United Kingdom, was fuelled by technological progress and the expansion of global capitalism. It evolved through phases from water and steam power to electricity, digital technology, and cyber-physical systems. This transformation brought major changes such as urbanization, altered labour practices, and new social classes, while also causing environmental pollution and disruptions to traditional lifestyles. Despite these challenges, the revolution prompts societies to reevaluate and adjust their systems to ensure inclusiveness and accessibility. It highlights the need for a workforce skilled in adaptability, digital literacy, and ethical considerations in technology to succeed in the industrial revolution.

The first industrial revolution (1st IR) commenced in the mid-18th century, between 1750 and 1850, triggering significant advancements in agriculture, manufacturing, mining, and transportation. Machines began to replace humans and animals in various tasks, enhancing workload efficiency. The need for energy to power these machines led to the second industrial revolution (2nd IR) between 1850 and 1940, which introduced innovations in areas such as pipes, water, gas, and electricity, driving further industrial growth (Taşkan, Karatop and Kubat, 2020). The third industrial revolution (3rd IR) emerged post-World War II, marking the onset of the digital age. This period saw the rise of computers, consoles, and cell phones, revolutionizing communication and productivity. The fourth industrial revolution (4th IR) ushered in the era of interconnected technologies, including artificial intelligence, robotics, cloud storage and the fusion of technologies that blur the boundaries between physical, digital, and biological spheres, known as cyber-physical systems. This era categorized advancements into biological, digital, and physical domains, with developments like 3D printing, IoT, and AI shaping our daily lives (Apriliyanti, 2022). Klaus Schwab coined this term "fourth industrial revolution" in 2016, pointing out that it is moving rapidly and exponentially compared to the previous industrial revolutions. This rapid progress led to discussions about the "Fifth Industrial Revolution".

The 5th industrial revolution is based on 4th industrial revolution and focuses on resilience, sustainability, human, environmental, and social factors, including intelligent robots and machines working alongside humans. Unlike 4th industrial revolution, which focuses on technologies such as the Internet of Things and big data, data science and automation. The 5th industrial revolution aims to balance automation and human

intervention, enabling critical thinking and adaptability while leveraging machine precision. The fifth industrial revolution (5th IR) marks a pivotal shift towards enhancing human well-being through the collaborative relationship between humans and robots across various domains. The fifth industrial revolution (5th IR), as outlined by Ikenga and Sijde (2024), emphasizes the strategic integration of human workers and collaborative robots (Cobots) within business social networks. The introduction of collaborative robots with decision-making capabilities aims to elevate service standards and boost production efficiency, promoting a harmonious collaboration between humans and sophisticated human-machine systems. Research indicates that the fifth industrial revolution (5th IR) was based on the advances made by the fourth industrial revolution (4th IR), including artificial intelligence, robotics, IoT, cloud computing, big data, and 3D printing technologies. The fifth IR improves these technologies by focusing on increased flexibility and integration, especially for new communication devices such as drones and moving robots (Ibinaiye, and Jiyane, 2021). It emphasizes the use of mechanical and digital machines to improve information transfer and communication between networks, including IoT.

According to Ziatdinov, Atteraya and Nabiyev (2024), the transition from the 4th to the 5th IR highlights a shift from a focus on productivity and versatility to sustainability and worker welfare. Climate change, exacerbated by industrial greenhouse gas emissions, has underscored the need for more sustainable practices in the fifth industrial revolution. The era emphasizes energy transformation and changes in workplace dynamics, where robots are increasingly taking on repetitive tasks. It marks a transformative period where information resources and services transition into a technologically driven format accessible anytime, anywhere through ICT devices.

The integration of cutting-edge technologies such as big data analytics, artificial intelligence, and the Internet of Things defines the skills and competencies required in the 5th IR across various industries, including education and libraries. Librarians play a crucial role in adapting to technological changes and ensuring inclusive access to library services, particularly for users in open and distance learning institutions (Ziatdinov et al., 2024). Proficiency in data management, including data collection, analysis, and visualization, is essential for supporting evidence-based decision-making and enhancing service inclusion (Thiruppathi, 2024). Librarians should also possess expertise in information retrieval to cater to diverse learning needs, sourcing material from online databases and digital repositories to facilitate the adoption of new technologies (Bokoh et al., 2023).

Open and Distance Learning (ODL) is an educational framework defined by the Commonwealth of Learning (2020) that enables learners to access learning resources in a flexible and unrestricted manner, irrespective of geographical or time constraints. It aims to serve students who are unable to physically attend traditional face-to-face classes due to factors such as geographical distance, work commitments, or personal responsibilities. ODL commonly employs internet-based platforms, digital materials, and innovative teaching techniques to facilitate training delivery and foster interaction between students and instructors.

The popularity of open and distance education within Nigeria's educational system is increasing, with the country's support through two learning modes: single and dual.

Presently, Nigeria has one exclusive university offering open and distance education and eight hybrid open and distance education universities. These institutions are recognized for their unique remote operation licenses and their accessible study methods. The National Open University of Nigeria, specializing in open and distance education, is notable for its singular focus. The distance centres of these dual-mode universities can leverage both methods for resource sharing and in-person interaction (Ekwueme & Ilo, 2019). The integration of modern technology with a human-centric approach has had a significant impact on Open and Distance Learning (ODL) during the Fifth Industrial Revolution (5IR). The key impacts include personalized learning experiences, improved accessibility, enhanced interactivity and engagement, data-driven decision-making analytics, and a wide array of learning opportunities. Artificial Intelligence (AI) and machine learning utilize student data to develop customized learning paths, while assistive technologies enable quick translation, transcription, and text-to-speech functions. Virtual reality and augmented reality allow for immersive learning environments where students can participate in virtual classrooms and collaborative activities. Educational institutions employ data-driven decision-making analytics and big data to monitor student progress and identify those at risk of academic challenges. The Internet of Things (IoT) facilitates global connectivity for learners, granting access to educational resources and specialists worldwide. Advanced technologies such as automation and intelligent systems streamline administrative processes, reduce operational costs, and boost efficiency, allowing institutions to allocate more resources towards improving the learning experience (Semaniuk & Melnyk, 2022).

In the library service domain, the 5th IR represents collaboration between humans and machines to enhance the efficiency of information service delivery to library users. Essential technologies for implementing the 5th IR include big data analytics, Internet of Things, collaborative robots, Blockchain, digital twins, and forthcoming 6G systems (Adel, 2022). As we transition from the first to the fifth industrial revolution, technological advancements in service provision have shifted libraries from manual to computer-based operations, leading to online service delivery. The utilization of Artificial Intelligence and robotics in service provision and delivery have expanded access to services for learners across different locations, as noted by Ziatdinov, Atteraya, and Nabiyev (2024). Despite the benefits, librarians may face challenges in implementing the 5th industrial revolution in service provision, such as a lack of requisite skills, infrastructures and funding. Addressing these issues require librarians to acquire new skills through various learning avenues. Introducing robots into dynamic, human-populated environments necessitates their ability to learn new skills through diverse methods, mirroring the cognitive adaptability of humans (Ziatdinov, Atteraya, and Nabiyev, 2024). These acquired skills will enable librarians to effectively collaborate with collaborative robot capabilities in the information service delivery process, thereby enhancing personalized library services for users. It is upon this bedrock that the study seeks to investigate the librarians and the fifth industrial revolution skills, challenges, and strategies for providing library services in an open and distance learning.

Research Objectives

The general objective of the study is to investigate Librarians and the Fifth Industrial Revolution skills, challenges, and strategies for providing library services in an open and distance learning. specifically, the objectives are:

1. Ascertain the skills needed by librarians for effective implementation of the 5th Industrial Revolution to enhance effective library services delivery in an Open and Distance Learning.
2. Identify Challenges Librarians encounter in the implementing the 5th Industrial Revolution to enhance effective library services delivery in an Open and Distance Learning.
3. Suggest strategies for enhancing effective implementation of the 5th Industrial Revolution to enhance effective library services delivery in an Open and Distance Learning.

Literature Review

The Fifth Industrial Revolution (5IR) heralds the integration of cutting-edge technologies like artificial intelligence, robots, biotechnology, and the Internet of Things (IoT), demanding individuals to possess critical skills such as creativity, critical thinking, adaptability, digital literacy, emotional intelligence, resilience, and cross-cultural competency (Ikenga and Sijde, 2024). Librarians, crucial in this transition, must adapt to technological changes and ensure diverse and inclusive library services, particularly for those in open and distance learning environments (Ziatdinov et al., 2024). Essential competencies for librarians in the 5IR era include learning and innovation skills, digital literacy skills, and career and life skills, encompassing creativity, critical thinking, communication, collaboration, flexibility, adaptability, initiative, social interaction, productivity, accountability, and leadership (Ikenga & Sijde, 2024). Moreover, librarians need competencies in critical thinking, analytical thinking, emotional intelligence, problem-solving, technology use and development, self-management, and leadership competency to thrive in the 5IR (Demir & Ercan, 2019).

Skills for Librarians in the 5th Industrial Revolution

Leadership skills are crucial for guiding the integration of humans and intelligent systems, managing diverse teams, adapting to technological progress, and fostering effective communication and collaboration (Ikenga & Sijde, 2024). Librarians must also exhibit networking and collaboration abilities to enhance the inclusiveness of library services (Chisita et al., 2019). In the context of the 5IR, librarians must possess digital literacy skills to effectively manage information using digital tools and technology for service delivery (Jyotsna & Madhu, 2021). The acquisition of data management skills which involve data to extract meaningful insights to service delivery are crucial for librarians to collect, analyse, and visualize data, enabling evidence-based decision-making and enhancing service inclusivity (Thiruppathi, 2024).

In the Fifth Industrial Revolution (5IR), librarians must leverage tools like the Internet of Things (IoT), virtual and augmented reality, and artificial intelligence (AI) to enhance library services delivery. Essential skills for librarians include teaching proficiency, technology commercialization, strategic planning, and consulting, along with being tech-

savvy, cooperative, creative, and risk-aware (Apriliyanti, 2022). Also, librarians need to acquire STEM skills, including creativity, critical analysis, collaboration, and problem-solving skills competency, to adapt to the demands of the 5IR and meet the changing needs of users (Demir, and Ercan, 2019, Ikenga, and Sijde, 2024, Future of Jobs Report, 2020). By continuously updating their skills and embracing digital literacy, librarians can effectively navigate the challenges and opportunities presented by the 5IR, ensuring that library services remain inclusive, diverse, and responsive to evolving technological advancements. The adoption of the 5th Industrial Revolution will enrich service provision and delivery for all user categories, regardless of their specific requirements. Zaid and Nduka (2023) observe that many librarians are already cognizant of the importance of diversity and inclusive library services for visually impaired students, indicating that embracing diverse and inclusive library services brought about by the 5th revolution is beneficial for students. Trivedi and Negi (2023) suggest that the incorporation of an advanced technology like 5th industrial revolution in the traditional open and distance learning model is urgently required which will enable the higher institution to develop a blended or hybrid learning model.

Challenges faced by Librarians in the implementation of 5th Industrial Revolution

The Fifth Industrial Revolution (5IR) offers numerous benefits, but it also presents challenges for librarians seeking to implement these technologies to enhance library service provision. In this era, machines are expected to collaborate with humans to accomplish tasks, marking a significant shift. This presents a considerable challenge, particularly in libraries, as people were still adapting to the Fourth Industrial Revolution, which replaced many human jobs with machines. Now, the 5IR introduces a new era of human-machine collaboration in which the most advanced technology exists (Okesar, 2018). Despite this

librarians worldwide are afraid that the 5th industrial revolution will significantly influence their jobs (Ajani *et al.* 2022). As a result, it is quite likely that robots will replace humans, potentially increasing unemployment. In a similar line, the authors believe that librarians must recognise that in the 5th industrial revolution, there will be no separation between the cyber and physical worlds. These changes will affect not just their existing practices, but also their professional existence, which is a source of concern for majority of the librarians. Furthermore, one of the most fundamental issues associated with the 5th industrial revolution is providing library users with the abilities needed to think creatively and appropriately, and hence may not require the service of librarians. These advanced technologies are costly to obtain and maintain. Not all academic libraries would be able to afford the cost of training skilled and efficient workers to carry out the library services. Challenges such as financial constraints, outdated technologies, and lack of skilled workers can hinder the adoption of new technologies in libraries (Noah et al., 2020; Alala et al., 2024). Embracing 5IR offers a chance to drive unprecedented creativity and inclusivity, redirecting progress towards purpose and collective benefit.

Strategies for enhancing effective implementation of the 5th Industrial Revolution

The fifth industrial revolution (5IR) has made significant progress in digital technology, artificial intelligence, and the Internet of Things, and has changed libraries considerably. So, librarians must adapt to the mixture of traditional expertise and new technological skills, manage digital storage, navigate complex information landscapes and play an important role in maintaining the role of information storage. Librarians must acquire a range of skills and knowledge that blend traditional library practices with new technological competencies (Nwobu, *et. al.,* 2024). To effectively prepare for the Fifth Industrial Revolution (5IR), librarians should focus on continuous learning, technological integration, and networking (Noble et al., 2022). Librarians should engage in professional development activities like workshops, webinars, conferences, advanced degrees or certifications, and online courses to stay updated and enhance their skills. This view is supported by Eiriemiokhale and Sulyman, (2023) that librarians are participating in conferences and workshops to raise awareness of the tools of the fifth industrial revolution, improve their professional development and keep up to date with technological advances to provide high-quality and reliable information to users. To effectively use the technology of the Fifth Industrial Revolution (5IR) in the library services, librarians must focus on staff training, professional development, partnership formation and collaboration. It is essential to educate users on 5IR, gather feedback and provide continuous training to improve AI-driven services. Sikadinov, Attara, and Nibiev (2024) highlighted the importance of continuous training in digital literacy and technology, while Muraca, Bamire, and Allison (2021) emphasized that librarians must be innovative and creative to meet user requirements and improve the quality of services. Innovation and creativity should be seen as continuous and not short-term efforts in the implementation of 5th IR in library services provision and access to open and distance learning students.

Methodology

The study area covered all the librarians in National Open University of Nigeria. The population for the study is sixty (60) librarians from the National Open University of Nigeria. The entire population was used for the study due to its manageable size. The Google Form questionnaire was used for the collection of data. The Google Form questionnaire was sent to all the librarians' email and in their WhatsApp group account. Forty-five (45) out of sixty (60) respondents filled the form correctly and submitted. The study utilized Statistical Packages for Social Sciences (SPSS) to analyse the responses, which were coded in a spread sheet. The data was organized in tables based on the questionnaire and analysed using Simple percentage (%), Mean (x) scores, and Standard Deviation (SD). Analysis values were assigned to the four response categories, and the mean was interpreted in line with the 4-point scale ranging from (4) highest to (1) the lowest. In decision making, the lower limit of the high degree response category, which was 2.50, was used as a cut-off. Any item with a mean response of 2.50 and above was accepted as an influencing factor. Linear regression was used in testing the hypotheses, and the results were based on a P-value of 0.05 benchmark where the level of significance is above 0.05, it means that there is no significant relationship between the variables.

Data Presentation and Discussion of Findings

Research Question 1: What are the needed competencies skills librarians need to effectively implement the 5th Industrial Revolution to enhance the provision of Library services in Open and Distance Learning?

Table 1: Competencies skills librarians need to effectively implement the 5th Industrial Revolution to enhance the provision of Library services in Open and Distance Learning

S/N	Item Statements	SA	A	SD	D	Mean	SD
1	I am skilled in data management, which includes data collecting, critical analysis, and visualisation	18 (40.0)	26 (57.8)	1 (2.2)	0 (0.0)	3.38	.535
2	I possess the learning, teaching proficiency and innovative skills to integrate technology in providing library services to users.	16 (35.6)	28 (62.2)	1 (2.2)	0 (0.0)	3.33	.522
3	I can adapt to technological changes and curriculum changes.	24 (53.3)	19 (42.2)	0 (0.0)	2 (4.4)	3.44	.725
4	I have some knowledge of data science, and use of wireless technologies to address communication challenges within libraries	29 (64.4)	16 (35.6)	0 (0.0)	0 (0.0)	3.64	.484
5	I possess the collaborative and digital skills to work with people and machine in the provision of library services to learners	19 (42.2)	25 (55.6)	1 (2.2)	0 (0.0	3.40	.539
	Aggregate Mean					3.44	
	Criterion Mean					**2.50**	

The result of the findings in table 1 on data management skills, which includes data collecting, critical analysis, and visualisation had a mean score of 3.38 and SD .535. The result indicates a moderate level of competence with room for improvement. Improved data management training may enhance librarians' ability to make evidence-based decisions, particularly in the context of the fifth industrial revolution (5IR) and open and distance learning. The mean score of 3.33 indicates that librarians possess the learning. teaching proficiency and innovative skills to integrate technology in providing library services to users in the fifth industrial revolution. Continuous professional development

is essential to keep up with technological progress and the evolution of courses. A higher mean score of 3.64 for knowledge of data science and wireless technologies shows high competence in these fields. The mean score of 3.40 for collaborative and digital skills indicates moderate competence, which emphasize the need for librarians to have collaborative and digital skills to collaborate effectively with people and technology. Taking these skills into account will help librarians navigate the complexity of 5IR and improve their ability to provide effective and comprehensive library services.

Research Question 2: What are the challenges librarians will encounter in implementing the 5th industrial revolution to enhance the provision of library services in open and distance learning?

Table 2: Challenges librarians will encounter in implementing the 5th industrial revolution to enhance the provision of library services in open and distaning.

S/N	Item Statements	SA	A	SD	D	Mean	SD
1	I do not have the adequate skills for the implementation of the 5th IR.	7 (15.6)	25 (55.6)	13 (28.9)	0 (0.0)	2.87	.661
2	Implementation of the 5th IR in libraries will lead to frequent changes in curriculum development.	13 (28.9)	30 (66.7)	2 (4.4)	0 (0.0)	3.24	.529
3	The constant change in technology for the implementation will lead to economic waste.	4 (8.9)	12 (26.7)	23 (51.1)	6 (13.3)	2.31	.821
4	Inadequate training for the 5th IR will affect the implementation of the 5th IR in library services.	10 (22.2)	24 (53.3)	10 (22.2)	1 (2.2)	2.96	.737
5	Training and retraining will increase the overhead cost of library management.	16 (35.6)	17 (37.8)	8 (17.8)	4 (8.9)	3.00	.953
6	I do not possess creative, cooperative, and tech-savvy to implement the 5th IR Technology.	18 (40.0)	24 (53.3)	3 (6.7)	0 (0.0)	3.33	.603
7	It will be difficult for human to collaborate with machine to provide library services to users.	2 (4.4)	11 (24.4)	25 (55.6)	7 (15.6)	2.18	.747
	Aggregate Mean					**2.83**	
	Criterion Mean					**2.50**	

The result of the finding on Table 2, challenges librarians will encounter in implementing the 5th industrial revolution to enhance the provision of library services in open and distance learning shows that many librarians, with a mean score of 3.24 (SD = 0.529), significantly agree that the implementation of the 5th IR in libraries will bring frequent changes in curriculum development. They also agree that there is a need to be creative, cooperative, and tech-savvy to implement the 5th IR Technology, with a mean score of 3.33 (SD = 0.603). However, majority of respondents disagreed with the statements that learning new technologies too frequently will lead to inefficiency (Mean = 2.02) and that it will be impossible for humans and machines to collaborate in providing library services to users (Mean = 2.18). The table outlines challenges faced by librarians in implementing the 5th Industrial Revolution for the provision of library services in open and distance learning to include lack adequate training for the 4th IR and the overhead cost training and retaining of librarians will increase the library budget. This will affect the implementation of the 5th IR in the provision of library services. The respondents disagreed on the following assertion, that frequent changes in technology leads to economic waste with mean score of 2.31; and introduction of 5th IR can threaten their job with a mean score of 2.38. The aggregate mean score of 2.83 which is above the criterion mean of 2.50 suggests a moderate level of concern and uncertainty regarding the challenges associated with implementing the 5th IR in library services.

Table 4: Strategies to be employed by librarians for effectively implement the 5th Industrial Revolution to enhance provision of Library services to students in Open and Distance Learning

S/N	Item Statements	SA	A	SD	D	Mean	SD
1	Librarians should anticipate and accept the curriculum changes resulting from the 5th IR.	19 (42.2)	24 (53.3)	2 (4.4)	0 (0.0)	3.38	.576
2	Motivated librarians are more likely to adopt new knowledge and technology relevant to the implementation of the 5th IR.	22 (48.9)	22 (48.9)	1 (2.2)	0 (0.0)	3.47	.548
3	Should involved in continuous learning, technological integration, and networking to enhance the implementation of the 5th IR in provision of library services.	28 (62.2)	16 (35.6)	1 (2.2)	0 (0.0)	3.60	.539
4	Collaboration training and retraining of librarians through seminars and workshops will enhance the implementation of the 5th IR in library services.	23 (51.1)	21 (46.7)	1 (2.2)	0 (0.0)	3.49	.549
5	Creativity, innovation, and dedication will enhance the implementation of the 5th IR Technology among librarians.	21 (46.7)	24 (53.3)	0 (0.0)	0 (0.0)	3.47	.505
6	Acquiring the right skills/competencies for the implementation of the 5th IR will be an advantage.	19 (42.2)	26 (57.8)	0 (0.0)	0 (0.0)	3.42	.499

7	Improved power supply will enhance the implementation of 5th IR library services provision in open and distance learning libraries.	28 (62.2)	17 (37.8)	0 (0.0)	0 (0.0)	3.62	.490
8	Libraries should be adequately funded by management and government for the successful implementation of the 5th IR.	27 (60.0)	18 (40.0)	0 (0.0)	0 (0.0)	3.60	.495
	Aggregate Mean					**3.51**	
	Criterion Mean					**2.50**	

The result of the finding on table 3 indicates that majority of librarians, with a mean score of 3.62 (SD = 0.490), significantly agree that improved power supply will enhance the implementation of 5th IR inclusion in open and distance learning libraries. Furthermore, majority of the respondents agreed that continuous learning, technological integration, and networking to enhance the implementation of the 5th IR in provision of library services with mean score = 3.60 (SD = 0.539), and that Libraries should be adequately funded by management and government for the successful implementation of the 5th IR (mean score = 3.60; SD = 0.495). The aggregate mean of 3.51 which is above the criterion mean of 2.50 indicates overall agreement with these recommended strategies and practices.

Discussion of Findings

In table 1, the study revealed that skills possessed by the librarians in NOUN revealed that the librarians have data management skills such as sills in data collection, analysis and visualisation which corroborates with the assertion of Thiruppathi, (2024) that librarians should also be skilled in data management, which includes data collecting, analysis, and visualization to facilitate evidence-based decision-making and improve library service. The respondents have some knowledge of data science, and use of wireless technologies to address communication challenges within libraries. The finding corroborates with the view of Arulogunet, *et. al* (2020) that there is a connection between the fifth industrial revolution (5IR), data science, and library services, which is the use of wireless technologies to tackle communication obstacles in libraries. Also, in improving learning techniques and facilitating information access for diverse user demographics, suggesting that integrating wireless technologies from 5IR could bolster data science's support for data librarianship, especially in service provision.The respondents agree that they possess the learning and innovative skills to integrate technology in providing library services to users which corroborates with views of Ikenga, and Sijde, (2024) that essential skills needed for the 5th Industrial Revolution encompass learning, teaching proficiency and innovation skills, digital literacy skills, and career and life skills. Also, the result of the finding indicated librarians in NOUN can adapt to technological changes and curriculum changes, possess innovative skills, including creativity, critical analysis, problem-solving skills collaborative and digital skills for the implementation of the 5th IR technologies in the provision of library services to learners. This aligns with views of Demir, and Ercan (2019) and Ikenga, and

Sijde (2024) that the skills needed in the era of 5th IR are critical thinking and analysis, analytical thinking, collaboration; problem-solving, working with people, technology use and development, leadership competency.

In summary most of the respondents indicated they possess the skills needed to implement the 5th Industrial Revolution to enhance the provision and delivery of library services in open and distance learning with a mean score and SD, ranging from 3.64: 0.484 to 3.30: 0.798, which enables for their ease of implementing the fifth industrial revolution to improve library services for the benefits of learners, who learn at a distance. These valuable competencies assist professional librarians to surf information from web and equally direct users on how to easily do that. This s in line with what Thiruppathi, (2024) expressed that to satisfy the varied demands of users in open and distance learning contexts, librarians must be adept at leveraging digital resources, databases, and information systems, to facilitate evidence-based decision-making and improve service inclusivity. Therefore, librarians should be skilful, knowledgeable in all aspects to be abreast and serve the patrons with their professional integrity. More so, Bokoh*et al.* (2023) inferred that, for the need to accommodate a variety of learning needs, librarians should also be knowledgeable in information retrieval to obtain and distribute material from a variety of sources, including online databases and digital repositories. That will stress more use of 5thIR package in the provision of information resources and services for patron in ODL.

The responses from librarians in table 2 shows that there are challenges librarians encountered in implementing the 5th industrial revolution for enhancing provision of library services in open and distance learning. That majority of librarians, with a mean score and SD, ranging from 3.33, 0.603 respectively, indicated that they need to be creative, cooperative, and tech-savvy to implement the 5th IR Technology, 3.24, 0.529 respectively, also expressed that they believe that the Implementation of the 5th IR in libraries will bring frequent changes in curriculum development and the mean = 2.96, and SD = 0.821, has the opinion that they lack adequate training for the 4th IR and this will affect the implementation of the 5th IR in library services. This buttresses what the findings of Apriliyanti, 2022, which emphasizes that librarians need to possess several skills to guarantee the best possible service delivery: teaching proficiency, technology commercialization, globalization, future strategic planning, and consulting ability, alongside with having a sense of humour and teaching holistically, librarians also need to be tech-savvy, cooperative, creative, and risk-aware, so that they wouldn't be taken unaware all round in their services to their users.

Table 3 shows that there are responses from responding librarians on the strategies to be employed for effective implementation of the 5th Industrial Revolution to enhance provision of Library services to students in Open and Distance Learning. Majority of responding librarians with a mean score and SD score 3.62, 0.490 respectively, who agreed that improved power supply and employing experts to maintain and manage the 5th IR technological tools could be a strategic factor for librarians to effectively implement the 5thIR to enhance provision of Library services for the benefits of their learners'. Likewise other responses indicated that some factors could enhance their use and application of the 5thIR to their positive provision of the library services, to assist their users for their academic pursuit and studies. Such factor could be collaboration

training and retraining of librarians through seminars and workshops; continuous learning, technological integration, and networking, motivating librarians with different incentives in appreciation for work done; creativity, innovation, and dedication on the part of the staff; and acquiring the right skills/competencies. This is related to the findings of Eiriemiokhale and Sulyman (2023) that librarians are becoming aware of various 5th IR tools through exposure to their functions at conferences and workshops for their professional development, and Noble et al., (2022) that emphasised that librarians should focus on continuous learning, technological integration, and networking to effectively prepare for the implementation of Fifth Industrial Revolution (5IR). Furthermore, Ziatdinov, Atteraya, and Nabiyev (2024) highlighted the significance of enhancing digital literacy and technology-related competencies through on-going training and retraining to align with the 5th Industrial Revolution. This will be of advantage to the librarians, professional, para-professional and our usual library assistants, if they really want to stay in the job and work efficiently for an effective output and a greater outcome.

Conclusion

The study on implementing the Fifth Industrial Revolution in libraries for open and distance learning at the National Open University of Nigeria illuminates the challenges, necessary skills, and recommended strategies for librarians in the transformative era. To improve the implementation of the fifth IR in academic libraries, libraries must be integrated into a technology-driven format to provide library services to students who are involve in open and remote learning. Librarians should recognize the significance of being tech-savvy, adaptable to curriculum changes, and proficient in data management to enhance library services. Despite concerns about training costs, job security, and economic efficiency, there is a moderate level of concern and uncertainty regarding the implementation of the Fifth Industrial Revolution. Librarians should embrace advanced technologies and collaborative approaches through training and retraining acquire the necessary skills in navigating these changes to provide innovative and inclusive services to students in open and distance learning settings.

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