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Promoting Library Collaboration
in a Changing World.***

2nd-7th July, 2023



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Akure

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LIBRARY SCHOOL CURRICULUM RELEVANCE TO SKILLS REQUIRED BY UNDERGRADUATES IN THE FOURTH INDUSTRIAL REVOLUTION

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Abstract

The Fourth Industrial Revolution (4IR) dispensation is evolving, and gradually the human workforce is being replaced with Automation, Artificial Intelligence, and Robotics among others. It is pertinent for undergraduates, especially Library and Information Science students to be adequately prepared for the world of work in this new dispensation through the curriculum of study they are exposed to enable them meet up with the needs of professional librarians for academic, government, private and public libraries upon graduation. Therefore, this study examined the relevance of the Library School curriculum to the skills required by graduates in the 4IR era in Kwara State, Nigeria. Survey design guided the study, and a questionnaire was used to collect data from 201 respondents. Data was analysed using descriptive statistics. Findings showed that the Library school undergraduates in Kwara State, Nigeria exhibits a high knowledge of the 4IR technologies and are knowledgeable in some of the skills required to function in the workplace in the 4IR era. The study recommended that the Library School undergraduates should be exposed to academic programs and training courses that address the 4IR peculiarities. This would lead to gaining creativity, complex problem-solving, collaboration, critical thinking, digital capabilities, and verbal communication skills among other skills. In addition, the Library School curriculum should be reviewed regularly to accommodate latest development as it affects the information profession through the hosting of new programmes, addition of new courses and review of current ones to suit the requirements of the workplace in the 4IR dispensation.

Keyword: Curriculum, Fourth Industrial Revolution Skills, Library School, Undergraduates, Kwara State, Nigeria

Introduction

The entire human race is ever evolving and constantly undergoing changes with the evolvment of technologies over the years. As technology evolved, diverse innovative, unprecedented, and significant developments were initiated in every facet of life. This technological advancements progressively birthed global and distinctive industrial revolutions namely the first industrial revolution (1IR) which was characterised by the mechanisation of production facilities powered by water and the steam engine. The second industrial revolution (2IR) focused on mass production of assembly lines coupled with massive labour and electrical energy. The third industrial revolution (3IR) was characterised by the emergence of computing, massive data generation, information technology and the Internet to automate production using smart machines and people who could program them.

Now, the world is witnessing another major revolution tagged the fourth industrial revolution (4IR) where interaction between human beings and technology is gathering momentum and the attendant development is transforming all aspects of life such as health care, commerce, business, agriculture, and education among others.

The 4IR is based on innovative combination of technologies, merging the physical and digital worlds by leveraging on Artificial Intelligence (AI), the Internet of Things (IoT) and smart factories to produce goods, such that computers and robots are now tasked with routine, mundane, repetitive, or hazardous tasks (Al-Maskari, Al Riyami & Ghnimi, 2022). The 4IR is equally characterised by the ubiquitous and mobile Internet together with some powerful sensors, AI, and machine learning; incorporating exponential technical and human capabilities through self-learning, algorithms, self-driving vehicles, human machine interactions, Virtual Reality, Big Data Analytics, and 3D printing (Tella, Okojie, Abdullahi & Ajani, 2022; Rahmah & Martini, 2020). Accordingly, Marwala (2019) averred that the 4IR is predicated on the confluence of the physical, digital, and biological technologies as the currency of 21st century workplace and organisation. Thus, the realities and effects of the 4IR are becoming more and more apparent as it is associated with a lot of changes that have impacted on practically every sphere of life and sectors of the economy such as health, business, manufacturing, estate management, aviation, security, and even, the educational system is not immune from the 4IR tsunami.

Indisputably, the hallmark of the 4IR encompasses digitalisation, networking, and virtualisation in every aspect of life coupled with automation and data exchange in manufacturing technologies based on digital technology (David-West, 2021). Also, the 4IR through massive advances in computing technology powered by information and communication technologies (ICTs) heralded the digital transformation of operational activities in organisations, thus, bringing changes and new realities into every sector in the workplace (Tella, Bajeh, Olaniyi & Ajani, 2022). Moreover, the 4IR has to do with automation, data sharing and management in digitally based industrial systems leading to a fully intelligent, interconnected, and digitised production factories and organisational activities (Spottl & Windelband, 2020). Thus, signifying that the 4IR is an inevitable revolution which activities of the human economy must embrace, for efficiency, effectiveness, competitive edge, profitability, innovation, economic development, and organisational growth.

Unarguably, the digital age brought lots of innovations which calls for the need to review curriculum of courses/programmes of study in universities to accommodate the new developments and subsequently equip undergraduates with necessary skill sets to function in a digitally transformed workplace. Curriculum development is a fundamental part of any educational programme. It provides list of courses offered, gives information on content, purpose, method, duration, trainers, and location of a programme all of which are essential in a successful dispensation of manpower training and education (Abubakar & Auyo, 2019). Basically, every university designs its own curricular to conform with the realities and transformations taken place in the world of business bearing in mind students' academic background, efforts, and the environmental characteristics in which it will be implemented to give them the best possible preparation and help integrate them into the workforce with minimal difficulty. Increasingly, however, these transformations brought to bear on every sphere of life by the 4IR technologies including the practice of librarianship calls for a review and update in the present curricular used in the training of Library School undergraduates to meet the needs and operations in libraries and information centres.

Library Schools are saddled with the responsibility of preparing undergraduates for work in libraries and the world of information profession in general. Also, the focus of Library and Information Science (LIS) as a course of study is not just with the study of libraries, but with the collection, creation, organisation, preservation, dissemination, and management of information resources in diverse formats; communication, use of recorded information and the political economy of information through the deployment of ICTs (Bawden & Robinson, 2016). As a matter of fact, the goal of LIS as a multidisciplinary course of study is to produce qualified library and information science professionals that can easily fit into the workplace of the 21st century. Consequently, there is need to rejig and infuse into the current curriculum of study in library schools' new areas of specialisations such as Data Science, Data Management, Computer Science, Coding, Project Management, Information System, Information Architecture and Digital Humanities, among others to expand the frontiers of knowledge in LIS (Assefa & Wang, 2018; Abubakar, 2021). In the long run, this would help in exposing undergraduates to the 4IR technologies making waves in the workplace as a way of preparing and equipping them with skills required to enhance their employability upon graduation.

Furthermore, the LIS discipline is ever evolving and undergoing changes. It supports the professional activities of a collection of disciplines, including Information Management, Librarianship, Archiving and Records Management and adapts to a new information management environment where technology dictates the pace of activities. Therefore, it is germane that the library school curriculum is reviewed regularly in line with the realities of the information age in the 4IR dispensation as a way of ensuring that undergraduates in library schools are adequately prepared and equipped with requisite skills that will meet the needs of 21st century workplace where computing technologies dictate the pace of activities.

Undisputedly, the practice of librarianship has witnessed lots of transformational activities because of the introduction and deployment of ICTs into library and information service delivery and practice. According to Hu (2013), the introduction of digital technologies ushered in large increases in digital resources and the Big Data era, thus, smart mobile devices, applications and wireless networking merged information technology with information resources, and management deeply impacting information services delivery and the development of Library and Information Science profession. No doubt, these observed developments and many more calls for an urgent review of the curriculum used in the training of library school undergraduates in Kwara State in particular, and Nigeria in general to update the skill sets needed to meet the needs and operations of the 21st century libraries and information professionals.

Equally, advances in computing technologies changed the face of the educational sector into an open global market whereby the need for visibility and competitiveness brought to the fore the need to impact on undergraduates' new skill sets, such as complex problem solving, creativity, critical thinking, people management, cognitive flexibility, negotiation, judgement, and decision making amongst others to prepare them for the world of work in the 4IR. Therefore, it is of utmost importance, to ensure that the library school curriculum is technologically based, and market driven to meet up with the realities of the job market and ensure the seamless placement integration of the LIS graduates into the world of work in the 4IR era. It is against this backdrop that this study examined library school curriculum relevance to skills required by undergraduates in the fourth industrial revolution in Kwara State, Nigeria.

Objective of The Study

The main objective of this study was to examine the relevance of library school curriculum to skills required by undergraduates in the fourth industrial revolution in Kwara State, Nigeria.

The survey addressed the following research questions:

1. What is the library school undergraduates' knowledge of 4IR technologies in Kwara State, Nigeria?
2. What are the types of 4IR skills required by Library School undergraduates in the future workplace in Kwara State, Nigeria?
3. What is the nature of curriculum used in training undergraduates in Library Schools in Kwara State, Nigeria?
4. What are the barriers militating against the inclusion of 4IR skills into Library School curriculum in Kwara State, Nigeria?

Literature Review

Undergraduates' Knowledge of 4IR Technologies

Technological advancement resulted in the birthing of the 4IR through the coming together of digital and physical technologies, creating responsive, interconnected operational IT systems on shared, and highly industrial-optimised computer platforms (Fullan & Langworthy, 2019). Wigmore (2020) observed that the 4IR is the current and developing environment in which disruptive technologies and trends such as Internet of Things, Robotics, Virtual reality and AI are changing how the modern people live and work. Similarly, Lund (2021) argued that the 4IR incorporates technological advancements such as AI, Block Chain Technology, Advanced Robotics, Big Data Analytics, Virtual Realities, IoT, Quantum Computing, 3D printing, Cloud Computing Technology, Advanced wireless technologies, and Nanotechnology among others, thereby moving the dimension of information dissemination and management to another level. Ally and Wark (2020) averred that the 4IR heralded the evolution of ICTs towards greater automation and interconnectedness in workplaces. Thus, adequate knowledge of the 4IR technologies by library school undergraduates is critical to their readiness for world of work in the 4IR dispensation.

Knowledge of 4IR technologies by the library school undergraduates connotes their readiness for the workplace of the 4IR era. Elayyan (2022) noted that knowledge of 4IR technologies will have significant effect on undergraduates' learning opportunities, instructional procedures, curriculum design and implementation and workplace skill sets. Several studies have reported the importance of undergraduates having knowledge of and be exposed to the operations of the 4IR technologies to enhance their employability upon graduation. For instance, Oke and Fernandes's (2020) study on innovations in teaching and learning: exploring the perceptions of the education sector on the 4IR reported that knowledge of 4IR could facilitate students' learning experience and make them capable of gaining skills needed for the workplace such as analytical thinking, innovation, complex problem solving, leadership and social influence, coordination, and time management. Sahu, Agrawal and Kukreja (2021) studied industry 4.0: readiness of undergraduate students in India. They discovered that students being abreast with 4IR related technologies assisted in gaining expected skills and increasing their employability opportunities.

Tinmaz and Jin's (2019) study on a preliminary analysis of Korean university students' readiness level for Industry 4.0 revolution reported that students need to be aware of the various 4IR technologies to be prepared for the workplace realities. Similarly, Ujakpa, Osakwe, Iyawa, Hashiyana and Mutalya (2020) studied industry 4.0: University students' perception, awareness, and preparedness in Namibia. They found that students are aware of

industry 4.0 but need further education on its applications to prepare them to be able to work within the era of the revolution. Al-Maskari, Al Riyami and Ghnimi 's (2022) study on factors affecting students' preparedness for the 4IR in higher education institution in the Sultanate of Oman discovered that undergraduates' knowledge of 4IR technologies and organisational dimension impacted their preparedness for the 4IR controlled workplace. Thus, the reports of the reviewed studies revealed that undergraduates' knowledge of the 4IR technologies is crucial to developing required skills in the world of work in the 4IR dispensation era.

4IR Skills and Library School Undergraduates

The emergence of the 4IR for education created possibilities for billions of people around the world to connect and be efficient in their duties (Okeke, 2022). Accordingly, the World Economic Forum (2016) reported that the core skills needed in the 4IR era can be categorised into abilities skills, basic skills, and cross functional skills. Rios, Ling, Pugh, Becker, and Bacall (2020) mentioned that it is pivotal for students to develop the 21st century skills as a way of promoting workforce preparedness and long-term success. Sahu, Agrawal, and Kukreja (2021) corroborated that students should have problem-solving, communication, interpersonal, lifelong learning, and technical skills to be prepared for the 4IR era. Similarly, Eleyyan (2022), stated that students need to have technical skills, critical thinking, coordination, verbal communication, and time management skill for them to be prepared for the 4IR work environment. To Rampasso, Mello, Walker, Sim~ao, Ara_ujo, Chagas, Quelhas and Anholon (2020), undergraduate students need to possess decision making, communication, leadership, and digital literacy skill to be prepared for the 4IR era. In this vein, Halim, Shokheh, Harun, Ebrahimi, and Yusoff (2019) remarked that students need communication, creativity, collaboration, and critical thinking skills to be prepared for the 4IR era.

Consequently, developing requisite 4IR skills would to a reasonable extent determine undergraduates' preparedness for the workplace in the 4IR era. Thus, the onus rest on the Library Schools management to provide undergraduates with opportunities to develop, grow and be equipped with the appropriate skill sets to usher and integrated them into the workforce of the 4IR era upon graduation Also, it is of great necessity to inculcate the knowledge in students so that they will not be left out in the scheme of things as the 4IR evolves by continuously exposing them to training and retraining in skills required of the 4IR era to keep them abreast of the latest development in the field of librarianship and prepare them for them for the work environment. In the long run, their job security would be guaranteed (Al-Maskari, Al Riyami & Ghnimi, 2022).

Curriculum Development For Library School Undergraduates

Academic programs and trainings are critical to preparing students for the 4IR era. The curriculum of any degree program goes a long to facilitate undergraduates' readiness for the realities of the 4IR working place (Maskari, Al Riyami & Ghnim, 2022). Rampersad (2020) observed that the work environment has become redundant due to Automation and AI and the challenge rests with educators to prepare learners for the future workforce. Curriculum is not simply a set of plans to be implemented, but rather, it is constituted through an active process in which planning, acting, and evaluating are all reciprocally related and integrated into the process (Coles & McGrath, 2013). As such, Library schools need to prioritise selecting a curriculum that would embrace and fit into the necessary skills of the 4IR technologies.

Accordingly, Omar, Miah, and Nkabyo (2014) advocated the need for the constant reassessment and review of the curricular in higher institutions to accommodate changes evolving in the world of work. While, Halim, Shokheh, Harun, Ebrahimi, and Yusoff (2019) argued that the curriculum should be innovative and prepare students for the requirement of this digital era. Therefore, it is important that the Library school curriculum align with the current realities in the world of work by ensuring that courses designed for undergraduates clearly and accurately reflects the realities and skills of the 4IR and LIS educators need to harness the relevance of the library school curriculum and equip students with the skills relevant in the 4IR era.

Challenges of Incorporating The 4IR Skills into Library School Curriculum

Without any doubt, the 4IR has associated challenges and the digital revolution brought about by the technologies presents new opportunities; create barriers in diverse sectors and most especially in the education sector (Omagbemi, 2022). Studies have revealed that library school undergraduates are graduating with insufficient skills for the new labour market, hence, they are rendered unemployable. For instance, Yaya and Adeeko (2019) noted that library school graduates of the 4IR era lack the essential abilities required in the workforce of the 21st century due to the inadequacy of the curriculum that was used in training them. On his part, Abubakar (2021) identified inadequate funding, insufficient infrastructure, learning resources, and lack of participation of critical stakeholders in curriculum developments as major barriers to the inclusion of 4IR in LIS education in Nigeria.

According to Odeyemi (2019), inadequate technology infrastructure, unreliable power supply, absence of technical skills, and poor attitudes toward advanced automation among others were challenges identified to hinder libraries 'readiness for the 4IR workplace. Similarly, Saka, Garba and Zarmai (2018) found that major challenges facing LIS education in the 4IR are improper development, implementation, and review of LIS curricula as well as shortage of information technology facilities because of poor funding situation. No doubt, the 4IR technologies are transforming the way library and information services are being rendered. There is therefore the need for stakeholders in Library education in Kwara State in particular, and Nigeria in general to be proactive by responding positively to the rapid advancement that this technological innovation has brought through the reviewing and upgrading of Library School programmes and introduction of new courses to fulfill the demand for skilled LIS graduates and ability to cope with the realities of the 4IR era. It is against this background that the study examined library school curriculum relevance to skills required by undergraduates in the fourth industrial revolution in Kwara State, Nigeria.

Methodology

The study adopted the descriptive survey research design. The study population comprised all the 1,644 Library and Information Science undergraduates in the three universities duly accredited by the National Universities Commission (NUC) to run B.Sc. Library and Information Science degree programme in Kwara State, Nigeria. The stratified random sampling technique was used to select participating universities, since not all the universities in Kwara State run a Bachelor of Science degree programme in Library and Information Science. A sampling fraction of 15% was used to select the respondents from each of the three universities that constituted the study population thus, giving a total sample size of Two Hundred and forty-seven (247) undergraduates This is consistent with Smart Methodology (2012) as cited in Ogunwuyi (2017) to allow for equal representation of the study sample.

The instrument for data collection was a structured questionnaire titled "Library school curriculum relevance and skills required by undergraduates in the fourth industrial

revolution" Scale (LSCRASRU4IR). The questionnaire is divided into five sections and consists of closed-ended, open-ended item-statement questions. Section A focused on the respondents' demographic information, such as the institution's name, gender, and age range. Section B comprised seven item-statements that measure the respondents' knowledge of 4IR technologies using a four-point Likert scale ranging from strongly agree (4) to strongly disagree (1). Section C contains sixteen item-statements on library school curriculum contents, using a four-point Likert scale ranging from strongly agree (4) to strongly disagree (1). Section D comprised fourteen item-statements that measured the 4IR skills required by respondents, using a four-point Likert scale ranging from strongly agree (4) to strongly disagree (1). Section E comprised six items on challenges to the inclusion of required 4IR skills in the library school curriculum, using a four-point Likert scale ranging from strongly agree (4) to strongly disagree (1). The overall reliability coefficient of the instrument was estimated using Cronbach's alpha. A reliability coefficient of 0.70 was found acceptable for this study since it was way above the 0.65 alpha coefficient set as adequate.

The questionnaire was digitised using Google form and administered through dedicated online WhatsApp forum specific to each population group. The snowball technique facilitated the administration by connecting contact persons to the targeted WhatsApp platforms. Copies of the questionnaire were administered between November 24th and November 28th, 2022. Strict adherence to ethical guidelines was maintained to ensure the participants' privacy and confidentiality. Informed consent was sought through the introduction letter attached to the questionnaire stating expressly the study's purpose, voluntary participation, and confidentiality. Out of the total number of links sent out, a retrieval rate of two hundred and one (201) was achieved, giving a response rate of 82%. In all 198 (81%) copies of the questionnaire were duly filled and found usable for analysis. The Statistical Product and Service Solution (SPSS) software version 25 was used for data analysis. The descriptive statistics used included frequency counts, percentages, means and standard deviations. Tables were used for the result presentation.

Results

The demographic profile of the respondents revealed that the female respondents accounted for a majority of the respondents with 105(53%), while 93 (47%) were males. This implies that most of the respondents were females. Their age varied from 16 years to more than 26 years ($\bar{x}$ = 22.94; SD = 4.11). This implies that most respondents were in the 21 – 25 age brackets. In addition, the sampled respondents were distributed among the three (3) universities, with a majority of the respondents from Kwara State University, Malete.

Table 1: Mean and Standard Deviation Scores of Library School Undergraduates' knowledge of 4IR Technologies in Universities in Kwara State, Nigeria

S/N	Knowledge of 4IR Technologies	Mean ($\bar{x}$)	SD
1.	Internet of Things Technologies.	2.77	0.93
2.	Cloud Computing Technologies.	2.83	0.77
3.	Robotics Technologies.	2.45	1.15
4.	Artificial Intelligence Technologies.	3.10	1.00
5.	Block Chain Technologies.	2.83	0.87
6.	Big data Technologies.	2.55	0.93
7.	Virtual reality	2.44	1.16
Weighted mean $\bar{x}$value = 2.71			

Table 1 presents the mean and standard deviation scores of the respondents' knowledge of 4IR technologies in Kwara State, Nigeria. The 4IR technologies that the respondents have knowledge of are Artificial Intelligence Technology ($\bar{x}$ = 3.10, SD = 1.00); Cloud Computing

Technology ($\bar{x} = 2.83$, $SD = 0.77$); The Internet of Things Technologies ($\bar{x} = 2.83$, $SD = 0.77$); and Block Chain Technologies ($\bar{x} = 2.83$, $SD = 0.87$) among others. To assess the respondents' knowledge of 4IR Technologies in Library Schools in Kwara State, Nigeria, as stated in research question 1. Table 1 presents the mean and standard deviation scores for each item. The average mean score for each of the items is 2.50. The average mean score of 2.50 was calculated by adding up each value of the 4-point Likert scale (strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1: $(4+3+2+1=10$ divided by $4 = 2.50$). Five out of the seven-items have a mean score greater than the average mean score (2.50). Also, the overall weighted mean of knowledge of 4IR of the respondents is mean ($\bar{x}$) = 2.71, which is greater than a threshold of 2.50. This implies that library school undergraduates in universities in Kwara State, Nigeria exhibits a high knowledge level of 4IR technologies. This could be adduced to the facts that the respondents are youths, belong to the Generation Z, and were born in the digital where digital technologies dictate the pace of activities.

Table 2: Mean and Standard Deviation Scores of Library School Curriculum Contents for Undergraduates in Universities in Kwara State, Nigeria

S/N	Library School Curriculum Contents	Mean ($\bar{x}$)	SD
1	Organisation of Knowledge.	2.92	0.91
2	Collection Development.	2.85	0.86
3	Library Administration and Management.	2.85	0.94
4	Bibliography.	2.70	0.72
5	Information Users.	2.85	0.86
6	Website Design.	2.85	0.86
7	Research Methodology.	2.92	0.91
8	Indexing and Abstracting.	2.92	0.91
9	Preservation and Conservation.	3.00	1.03
10	Reference Sources and Services.	2.85	0.94
11	Library Marketing and Public Relations.	3.00	1.03
12	Desktop Publishing.	2.62	0.92
13	Entrepreneurial Studies.	2.85	1.09
14	Online Information Retrieval.	2.70	0.99
15	Automation in Libraries.	2.85	1.09
16	Database Management System.	2.77	0.89
Weighted mean ($\bar{x}$) value		= 2.84	

The results in Table 2 showed that Preservation and Conservation ($\bar{x} = 3.00$, $SD = 1.03$); Library Marketing and Public Relations ($\bar{x} = 3.00$, $SD = 1.03$), Research Methodology ($\bar{x} = 2.92$, $SD = 0.91$); Indexing and Abstracting ($\bar{x} = 2.92$, $SD = 0.91$); Collection Development ($\bar{x} = 2.85$, $SD = 0.86$); Library Administration and Management ($\bar{x} = 2.85$, $SD = 0.94$); and Information Users ($\bar{x} = 2.85$, $SD = 0.86$) among others were some of the Library School Curriculum contents used in the training of the respondents. The average mean score for each of the items is 2.50. The average mean score of 2.50 was calculated by adding up each value of the 4-point Likert scale (strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1: $(4+3+2+1=10$ divided by $4 = 2.50$). All the sixteen items have a mean score greater than the average mean score (2.50). Also, the overall weighted mean of library school curriculum contents of the respondents is mean ($\bar{x}$) = 2.84, which is greater than a threshold of 2.50. This implies the Library school curriculum for undergraduates in grossly inadequate for the 4IR era. Hence, the need for urgent curriculum review to incorporate courses that will make the graduates of our library employable.

Table 3: Mean and Standard Deviation Scores of 4IR skill sets required by Library School undergraduates in universities in Kwara State, Nigeria

S/N	4IR skills	Mean ($\bar{x}$)	SD
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1. Critical thinking skills.	3.00	1.03
2. Entrepreneurial skills.	2.92	1.14
3. Innovative skills.	3.00	1.07
4. Creativity skills.	3.00	1.03
5. Technical skills (such as coding).	2.84	1.02
6. Complex problem-solving skills.	2.90	0.99
7. Communication skills.	3.00	1.03
8. Research skills.	3.00	1.03
9. Emotional intelligence skills.	2.70	1.13
10. Soft skills.	2.70	0.91
11. Active learning and learning strategies skills.	3.08	0.99
12. Social networking skills.	3.08	1.07
13. People management skills	2.85	1.02
14. Collaborative skills	2.77	0.97
Weighted mean ($\bar{x}$) value	= 2.91	

The results in Table 3 revealed that active learning and learning strategies skills ($\bar{x}$ = 3.08, SD = 0.99); social networking skills ($\bar{x}$ = 3.08, SD = 1.07); critical thinking skills ($\bar{x}$ = 3.00, SD = 1.03); creativity skills ($\bar{x}$ = 3.00, SD = 1.03); innovative skills ($\bar{x}$ = 3.00, SD = 1.03); communication skills ($\bar{x}$ = 3.00, SD = 1.03); and entrepreneurial skills ($\bar{x}$ = 2.92, SD = 1.14) among others are some of the 4IR skills required by library school undergraduates in Kwara State, Nigeria for the 4IR dispensation. In addition, the average mean score for each of the items is 2.50. The average mean score of 2.50 was calculated by adding up each value of the 4-point Likert scale (strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1: (4+3+2+1=10 divided by 4 = 2.50). All the fourteen items have a mean score greater than the average mean score (2.50). Also, the overall weighted mean of 4IR skills required of the respondents is mean ($\bar{x}$) = 2.91, which is greater than a threshold of 2.50. This implies that library school undergraduates in universities in Kwara State, Nigeria are knowledgeable of some of the 4IR skills required to function in the workplace in 4IR era.

Table 4: Mean and standard deviation scores of barriers to 4IR Technologies' inclusion into Library School Curriculum of undergraduates in Kwara State, Nigeria

S/N	Barriers	Mean ($\bar{x}$)	SD
1.	Bureaucratic bottle neck.	2.92	0.61
2.	Inadequate infrastructural facilities.	3.30	0.60
3.	Lack of funding for implementation.	3.62	0.83
4.	Inability to identify in-demand skill	3.38	0.49
5.	Lack of requisite knowledge.	3.24	0.80
6.	Poor implementation.	3.37	0.62
	Weighted mean $\bar{x}$value	= 3.30	

The results in Table 4 revealed that inability to identify in-demand skills ($\bar{x}$ = 3.38, SD = 0.49) inadequate infrastructure ($\bar{x}$ = 3.30, SD = 0.60); poor policy implementation ($\bar{x}$ = 3.37, SD = 0.62); and inadequate funding ($\bar{x}$ = 3.62, SD = 0.83) among others are some of the barriers militating against the inclusion of the 4IR skills into the Library school's curriculum of undergraduates in Kwara State, Nigeria. The average mean score for each of the items is 2.50. The average mean score of 2.50 was calculated by adding up each value of the 4-point Likert scale (strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1: (4+3+2+1=10 divided by 4 = 2.50). Five out of the six items have a mean score greater than the average mean score (2.50). Also, the overall weighted mean of knowledge of 4IR of the

respondents is mean ($\bar{x}$) = 2.71, which is greater than a threshold of 2.50. this implies that some challenges are militating against the inclusion of 4IR technologies in the curriculum.

Discussion of The Findings

The 4IR heralded the evolution of ICTs towards greater automation and interconnectedness in workplaces. Results from this study revealed that Library school undergraduates in universities in Kwara State, Nigeria exhibits a high knowledge of 4IR technologies. This finding is in tandem with other studies. For example, Al-Maskari, Al Riyami and Ghnimi (2022) studied factors affecting students' preparedness for the 4IR in higher education institutions in the Sultanate of Oman. They found that undergraduates' knowledge of 4IR technologies and organisational dimension impacted their preparedness for the 4IR controlled workplace. Similarly, Oke and Fernandes's (2020) study on innovations in teaching and learning: exploring the perceptions of the education sector on the 4IR in Africa reported that knowledge of 4IR could facilitate students' learning experience and make them capable of gaining skills needed for the workplace such as analytical thinking, innovation, complex problem solving, leadership and social influence, coordination, and time management.

Findings of the study revealed that Library school curriculum used by undergraduates in Kwara State, Nigeria consisted of course such as: Organisation of Knowledge, Collection Development, Library Administration and Management, Information Users, Computer and Data Processing, Research Methodology, Indexing and Abstracting, and Preservation and Conservation of library materials among others. To a large extent, the Library school curriculum in its present state is a far cry from the expectations of the 4IR dispensation where teachers are been encouraged to jettison the old order of knowledge impartation by evolving teaching strategies, that can support personalised learning of students for creativity, innovation, and complex problem solving, thus, have more time for individual instruction because workplace requirements and technology are changing so rapidly that students must become self-learners. This finding is contrary, to Halim, Shokheh, Harun, Ebrahimi, and Yusoff (2019) whose study on the insight of the Industrial Revolution 4.0 in the higher education system in Malaysia revealed that the fixed structure approach of the curriculum, which most universities use, is no longer adequate for preparing students for the 4IR age. They argued that if undergraduates are exposed to courses in the 4IR, the impact of such training will positively affect their readiness for the workplace. Thus, curriculum should be innovative and prepare students for the requirement of this digital era.

Also, Ramah and Marlini's (2020) found that in the 4IR, LIS graduates would be faced with new challenges, demands, and needs that have never existed before. Hence, there is need to review the current LIS curriculum to accommodate the development of the 4IR era for the programme to remain competitive in this era of disruption. Moreso, findings revealed that the curriculum presently used in training Library schools' undergraduates in Kwara State, Nigeria is grossly inadequate in preparing them for the 4IR workplace era. Therefore, as matter of urgency, Library School stakeholders should fashion out a curriculum that will incorporate courses such as Coding, Data Science, Artificial Intelligence, Computer Science, and Database Management among other related courses that will embrace the concept of Cloud Computing, Internet of Things, Big Data Analytics, Blockchain Technology and Robotics Technology among others. This would in the long run help in preparing undergraduates in Library Schools towards meeting the information needs of diverse users, the skill sets requirement of 4IR and the expectations of the employer of labour in the workplace in the 4IR era.

Another major finding of this study revealed that library school undergraduates in Kwara State, Nigeria are knowledgeable of some of the 4IR skills required to function in the workplace in the 4IR era. Some of the 4IR skills identified by the respondents are active learning and learning strategies skills, creativity skills, originality and initiative skills, communication skills, research skills, social networking skills, and complex problem-solving skills among others. This finding corroborate with Sahu, Agrawal, and Kukreja (2021) who argued that students should have problem-solving, communication, interpersonal, lifelong learning, and technical skills to be prepared for the 4IR era. Eleyyan (2022) discovered that for students to be prepared for the 4IR, they need to have technical skills, critical thinking skills, coordination skills, verbal communication skills, and time management skill. Equally, Rampasso, Mello, Walker, Sim~ao, Ara_ujo, Chagas, Quelhas, and Anholon (2020) examined the research gaps in reported skills required for Industry 4.0 readiness of undergraduate students in Brazil. They found that students need to possess decision-making, communication, leadership, and digital literacy skills to be prepared for the 4IR dispensation. On their part, Halim, Shokheh, Harun, Ebrahimi, and Yusoff (2019) examined the insight of the industrial revolution 4.0 in the higher education system in Malaysia. They reported that students need communication, creativity, collaboration, and critical thinking skills to be prepared for the 4IR era.

Finally, findings from this study revealed that the inability to identify in-demand skills, inadequate infrastructure, poor policy implementation and inadequate funding are the major barriers militating against the inclusion of 4IR skills in Library School curriculum of undergraduates in Kwara State, Nigeria. This finding aligns with Abubakar (2021) who reported inadequate funding, insufficient infrastructure, learning resources, lack of participation of critical stakeholders in curriculum developments as major barriers to the inclusion of 4IR technologies in LIS education in Nigeria. Odeyemi (2019) averred that inadequate technology infrastructure, unreliable power supply, absence of technical skills, poor attitudes toward advanced automation among others are challenges to libraries 'readiness for the 4IR workplace. Saka, Garba and Zarmai (2018) argued that the major challenges facing LIS education in the 4IR are improper development, implementation, and review of LIS curricula as well as shortage of information technology facilities because of poor funding situation.

Conclusion

The hallmark of the 4IR is in the integration of networked technologies to facilitate automation with the onset of AI and IoT. Thus, Library School management in Kwara State in particular, and Nigeria in general need to as a matter of urgency initiate changes in line with the digital transformation currently taken place in every sector of human life. This will go a long way to ensure that the Library and Information Science undergraduates are not left behind in the scheme of things as it pertains to the 4IR dispensation. The results revealed that library school undergraduates in universities in Kwara State, Nigeria exhibits a high knowledge of 4IR technologies. The Library School curriculum consisted of course such as Organisation of Knowledge, Collection Development, Library Administration and Management, Information Users, Computer and Data Processing, and Research Methodology among others. Also, undergraduates are knowledgeable of some of the 4IR skills required to function in the workplace of the 4IR era. However, the inability to identify in-demand skills, inadequate infrastructure, poor policy implementation and inadequate funding are the major barriers militating against the inclusion of 4IR skills and technologies into the LIS curriculum of undergraduates in Library schools in Kwara State, Nigeria. Therefore, it is pertinent that the Library School management and Library educators in universities in Kwara State in

particular, and Nigeria in general through instructional programmes, curricula and learning environments prepare and equip LIS undergraduates with the knowledge of 4IR technologies and the skill sets relevant in the field of practice to herald them into the workplace of the 21st century where technology dictates the pace of activities.

Recommendations

Based on the study's findings, the following recommendations are made. Library and Information Science undergraduates should be exposed to regular training programmes and hands on practice on 4IR technologies with special focus on developing skills related to 4IR, such as proficiency in using high-impact technology, digital skills, complex problem-solving skills, critical thinking skills, and collaboration skills. Also, the Library school curriculum should be enriched with courses that address the 4IR peculiarities. This will go a long way to help them gaining creativity, complex problem-solving, collaboration, critical thinking, digital capabilities, and verbal communication skills among others.

In addition, the onus lies with the faculty to ensure a regular update of the LIS curriculum through the hosting of new programs and enhancement of the current curriculum to suit the requirement of 4IR dispensation. Moreso, the library school curriculum should include courses on area such as Data Science, Internet of Things, Cloud Computing, Virtual Reality, Artificial Intelligence, Machine learning and other emerging 4IR-related technologies. Equally, Library school undergraduates should be introduced to practical applications of courses that are related to librarianship and 4IR to get hands-on experience and be well-prepared to study and work in the 4IR dispensation.

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