Religious Education in the Fourth Industrial Revolution: Challenges and Opportunities in Nigeria

Timothy Abayomi ODUNAYO, PhD[1]
Oladele Olubukola OLABODE, PhD[2]
[1]*Department of Politics and International Relations, Lead City University, Ibadan, Nigeria*
[2]*Nigerian Baptist Theological Seminary, Ogbomoso, Nigeria*
[1]*fayomot2017@gmail.com, +2348059335904*
[2]*bukoladelebode@gmail.com, +2348030559740*

Abstract

The Fourth Industrial Revolution (4IR) is the current and developing environment in which changing technologies and trends such as the Internet of Things (IoT) and artificial intelligence (AI) are changing lifestyle and nature of work. The 4IR presents a number of implications for skills development and general education. This paper looked into Religious Education in the 4IR to determine the challenges and opportunities in the Nigerian context. The research employed a qualitative approach using unobtrusive research techniques which include documentary and conceptual analysis for authoritative sources to conceptualise and contextualise the 4IR and religious education in Nigeria. The findings of the study showed technological infrastructure, digital divide, content localization, quality control and misinformation, balancing traditional and technological approaches, preservation of cultural and religious heritage, ethical considerations and teacher training and professional development are common challenges of 4IR in Nigerian context. The study therefore recommends that government should invest in the development of infrastructure and human, technical, and financial capacity to develop the education system to participate in the 4IR as several opportunities were open religious education.

Keywords: Artificial intelligence (AI); Big data; Fourth Industrial Revolution (4IR); Religious Education, Internet of Things (IoT); Robotics

Introduction

The Fourth Industrial Revolution (4IR) is the developing environment in which changing technologies and trends such as the Internet of Things (IoT) and artificial intelligence (AI) are changing lifestyle and nature of work. The 4IR presents a number of implications for skills development and general education. These implications include reinventing educational systems and strategic approaches to increase creativity and innovation. Specifically, the 4IR tends to present both opportunities and challenges for religious education, as technology is enhancing access, engagement, and understanding while considering its impact on religious practices, values, and ethics. The paper seeks to provoke a thoughtfully integration of this technology into religious education pedagogy to adapt to the changing needs and realities of the digital age. In order to achieve this objective, the study firstly explains and conceptualizes the 4IR. Secondly, ideology and features of the 4IR are identified. Furthermore, the implications of the 4IR in religious education will be discussed. Lastly, the challenges and opportunities presented by the 4IR in terms of religious education will be identified. The research took a qualitative approach using unobtrusive research techniques which include documentary and conceptual analysis for the literature and secondary data obtained through a desktop study.

Concept and History of the 4IR

Scholars maintained that the industrial revolution was the most important single development in human history over the past three centuries. The Industrial revolution could be claimed to be a major development, change, or transformation that has taken place in the history of human society; ranging from the use of machines, telecommunications, electricity, to new developments in the form of technology (Stearns 2018,1). Mainly, any industrial revolution alters government policies and the method the government provides services to various communities, and influences both the social and economic aspects of society. As expounded by Vries (2008,158), industrial revolution refers to the occurrence, during the transition from a pre-industrial to an industrial society, of modern economic growth; in other words, a sustained and substantial increase of gross domestic product per capita in real terms.

The world has seen three different industrial revolutions that have taken place in the course of history. Ionescu (2018, 184) states that the First Industrial Revolution (1IR) had its roots in the Middle Ages and lasted to the year 1780. The 1IR saw the invention and expansion of the canal and later railway networks, which increased communication ability, and the invention of the stock exchange, which led to the rise of banks, financiers, and private investment (Roberts, 2015, 1). The 1IR was mainly based in Britain. After the transformation of the British Empire, many European countries soon followed in the revolution. The 1IR changed many societies dramatically from lower-income households to rich countries. The 1IR was so successful that it brought European countries out of the Dark Ages. The success of this revolution gave European countries supremacy over other parts of the world. The 1IR was a step in the right direction for human civilization.

The 1IR covered the period between the 18th and 19th centuries. During this period, human communities developed from agricultural activities to the use of mechanization. The steam engine was invented in the 1IR, which changed the means available for production. Communities around the world, mainly in Europe and North America, developed new ways of doing business and dealing with social issues. These changes brought new possibilities, responsibilities, and abilities. Through the 1IR, many countries were able to develop, expand, increase, and diversify their economies. The 1IR was essentially the improvement of infrastructure. The 1IR across the world is credited with the improvement of living standards, new skills, increased urbanization, and many more.

The Second Industrial Revolution (2IR) was the continuation of the previous era and began in the early 19th century. The 2IR saw major technological developments in steel, chemicals, electricity, and in various other fields (Agarwal and Agarwal 2017:1063). The invention of electricity was a crucial development as it made it possible for many industries to operate and expand their businesses. This technological advancement also made mineral exploration possible. The 2IR was characterized by the use of machines, which were mostly powered by electricity.

The Third Industrial Revolution (3IR) began in the mid-1900s. Roberts (2015:2) notes that the 3IR was pushed by the development of technological advancements in manufacturing, distribution, and energy factors. One of the biggest advancements in the 3IR era was the development of nuclear power, as well as the wide use of electronics. During the 3IR, many parts of the world began to catch up with Europe.

The first three industrial revolutions were characterized by technological advancements but not at the rate of current times. Recent times have seen rapid development, implementation, and use of technology for various reasons. Technology has become a huge part of human beings' life. Technology is giving societies new abilities and capacities and is changing lives. Society is therefore currently moving towards the 4IR. Xu, David and Kim (2018:90) explain

that the 4IR entails a society whereby individuals are able to move and interact with one another between digital domains with the use of technology to assist and manage life.

Ideology of the 4IR

The 4IR is about the digital revolution happening at the moment. The 4IR ushered in new possibilities and opportunities for society, which is built up from the continuation of many successes of the previous revolutions. The 4IR encompasses different emerging technologies and new ideas to solve the various challenges of the 21st century. The new revolution encompasses new ideas, new possibilities, new creations, and new inventions. This new revolution is about breaking frontiers. Schwab (2016, 12) points out that the new revolution is branded by a much more ubiquitous and mobile internet, by smaller and more powerful sensors that have become cheaper, and by artificial intelligence [AI] and machine learning.

The 4IR includes gene sequencing, nanotechnology, renewables, and quantum computing. The new revolution therefore goes beyond the use of smart technology, computers, and much more. It is the fusion of these technologies and their interaction across the physical, digital, and biological domains that make the 4IR fundamentally different from the previous revolutions (Schwab 2016:12). These new developments have been taking place at the same time to move the world into a new phase of growth, development, and discovery. The current revolution is taking place in all fields, sectors, and spheres of life.

The four industrial revolutions seen in the world were technology driven, and the use of various technologies assists the government and the private sector to experience growth at a quick pace. In current times, various new concepts and ideas are brought to life due to the use of technology. Ideas such as virtual worlds, smart cities, big data, Internet of Things (IoT), and AI have taken centre stage in driving development in the new era. Another similarity in these revolutions is the improvement of lives and the ease of doing business and providing services.

The 4IR is also known as Industry 4.0; however, the term "Industry 4.0" is mostly used in the business world. Erboz (2017, 2) define Industry 4.0 as a collective term for technologies of value chain organisations. Industry 4.0 deals with creating more digitized systems and network integration via smart systems (Erboz 2017, 3). In Industry 4.0, new systems will replace existing ways of performing tasks with human labour by using machines.

Features of the Fourth Industrial Revolution (4IR)

Erboz (2017, 2) argues that the components of Industry 4.0 are categorized as the IoT, Cyber Physical Systems, Internet of Services, and Smart Factory. There are, however, many other characteristics and features of the 4IR, such as AI, three-dimensional (3D) printing, robotics, blockchain technology, cryptocurrency, quantum computing, nanotechnology, and bioengineering. According to Skilton and Hovsepian (2018: 33), these technologies are changing how materials, products, and services are produced and consumed.

The 4IR is also characterised by the use of information and communications technology (ICT). ICT is widely used in business, government, and civil society organisations. The use of ICT involves computer software and hardware to perform tasks. The 4IR is viewed as the revolutionary change that takes place when ICT thrives in all industries, namely the primary, secondary, and tertiary industries (Lee et al. 2018:3). Below is a brief highlight on the components of 4IR:

Quantum Computing

According to Microsoft (2019), quantum computing takes days or hours to solve problems that would take billions of years using today's computers. It also enables new discoveries in the areas of healthcare, energy, environmental systems, smart materials, and beyond. Similarly, IBM (2019) explains that quantum computers could promote the development of new breakthroughs in science, life-saving medicine, machine learning methods to diagnose illnesses sooner, materials to make more efficient devices and structures, financial strategies to live well in retirement, and algorithms to quickly direct resources such as ambulances. According to Marshall (2016:288), modern societies are characterized in part by the value given to education. In order for countries to benefit from the 4IR, a significant shift in the education sector is required to ensure participation in the digital society.

Three-dimensional (3D) Printing
According to Eisenberg (2013: 7) the era of 3D printing is here. The historical patterns of growth in 3D printing are similar to those associated with the growth of home computing in the late 1970s. 3D printing is a process of making solid 3D objects from a digital file, or, as Chow-Miller (2018: 9) refers to it, the process of making items using what is called additive manufacturing. This new technology has seen widespread use in various fields such as medicine, car manufacturing, and many others, for different purposes. Some of the uses of 3D printing include making airplane parts, and artificial organs using human cells. This technology has been in use since the 1980s; however, it has passed through different developments. Nevertheless, it is only in recent times that the technology has gained momentum. 3D printing presents a much faster and cheaper way to create object.

Big Data
Big data refers to large sets of complex data, both structured and unstructured, which traditional processing techniques and/or algorithms are unable to operate on (Taylor-Sakyi 2016). Big data is seen as high-volume, high-velocity, and/or high-variety information assets that demand cost-effective and innovative forms of information processing that enable enhanced insight, decision making, and process automation. Big data platforms could assist organisations to analyses and make meaningful decisions based on the data available to them. As the world becomes more connected each day, large amounts of data are collected from different devices. A need to analyse these data for future use arises in order to reveal hidden information. De Mauro, Greco and Grimaldi (2015: 98) state that one of the important reasons for the big data phenomenon is the current extent to which information can be generated and made available. Governments and businesses depend on the amount of information generated through different technological modes for their decisions. For a government, this could be the number of people visiting a local police station or provincial hospital, or categorizing a crime hotspot. In addition, the large amounts of data collected will need sufficient space for storage, hence the use of new technological inventions.

Artificial Intelligence (AI)
The concept of AI has existed for over 60 years. It is the ability of computers to perform complex functions associated with human intelligence; however, AI has superior intelligence and capacity. Alsedrah (2017:3) states that AI is the field of study that describes the capability of machines to learn like humans and the ability to respond to certain behaviours. Through new computer algorithms and commands, machines are instructed to perform tasks in the same way as human beings. AI is referred to as the field of science aimed at providing machines with the capacity to perform functions such as logic, reasoning, planning, learning,

and perception (Perez, Deligianni, Ravi and Yang 2018:2). In other words, AI is computer software with human-like characteristics. The world has seen increased use of AI in self-driving cars, Apple's Siri, and Google. With the use of new technologies, computers are programmed to complete certain tasks by processing large amounts of data and recognizing patterns in the data.

Robotics
Robotics is built on the developments made in mechatronics, electrical engineering, and computing (Perez et al. 2018:24). As the environment changes, so too the use of robotics. Robotics is deeply rooted in industries such as car manufacturing plants that rely heavily on the use of machines for production. As pointed out by Karabegovi and Husak (2018:69), it is impossible today to imagine the production process in any industrial sector without industrial robots. The use of robots in different industries contributes to a faster production rate. Different companies resort to the use of robots to perform tasks that are seen as too complex for human beings to perform. Karabegovi and Husak (2018:69) further argue that the 4IR has contributed to the development of robotic technology because the strategies of the leading countries are to fully automate the production process, or to enable "intelligent automation." Companies seek increased productivity, hence the need for robots with superior abilities and intelligence. This leads to new developments and technologies to create robots in order to surpass the previous generation.

The Internet of Things (IoT)
In recent times, there have been developments in technology with the new concept known as IoT. Imagine a world where different electronic devices such as fridges, computers, television sets, mobile devices, and many more are connected to one another and to the Internet. This is possible through the concept of IoT. This connection via the Internet enables various devices to send and receive information from one another (i.e. to share data). Gartner.com (2016) defines IoT as the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment. This digital interaction between and within machines and systems forms the heart of the 4IR (Karabegovi and Husak 2018:72). In simple terms, as argued by De Saulles (2017:1), IoT has the potential to change the way humans work and live to a great extent.

Education in the Fourth Industrial Revolution (4IR)
Education in the Fourth Industrial Revolution (4IR) refers to the evolving educational approaches and strategies aimed at preparing individuals for the changing demands of the modern era characterized by rapid technological advancements.In the 4IR, emerging technologies such as artificial intelligence, robotics, Internet of Things (IoT), big data, and automation have a profound impact on society and the job market (Rotatori, Lee & Sleeva 2021). Education in the 4IR focuses on equipping learners with the skills and competencies needed to thrive in a technology-driven world. It emphasizes the development of critical thinking, problem-solving, creativity, collaboration, digital literacy, and adaptability. The goal is to empower individuals to embrace and harness emerging technologies, rather than being overwhelmed or displaced by them (Satpathy, Dash & Mohapatra 2020). In addressing the challenges and opportunities presented by the 4IR, educational institutions are incorporating innovative teaching methodologies and tools. These may include project-based learning, experiential learning, blended learning (combining online and in-person instruction),

gamification, and the use of educational technologies such as virtual reality and augmented reality.

Furthermore, there is an increased emphasis on interdisciplinary education, recognizing that the 4IR requires individuals with a broad range of knowledge and skills spanning multiple fields. Collaborative and cross-disciplinary approaches promote holistic problem-solving and encourage creativity and innovation (Penprase 2018).Education in the 4IR also involves a lifelong learning mindset, as individuals need to continuously update their skills and knowledge to adapt to rapidly changing technologies and job market demands. This calls for the integration of learning opportunities throughout one's life, including formal education, online courses, vocational training, and professional development programs (Pedron, 2018).

Invariably, education as related to religionin the 4IR aims to equip learners with the skills, mindset, and knowledge necessary to navigate and thrive in an increasingly technology-driven and interconnected world. While embracing emerging technologies and fostering essential competencies, individuals can seize the opportunities presented by the 4IR and contribute to spiritual, moral and societal advancements.

Concept of Religious Education

The concept of religious education refers to the process of imparting knowledge, understanding, and fostering spiritual and moral development within a particular religious tradition or multiple religious traditions. It involves teaching individuals about the beliefs, practices, rituals, scriptures, and values associated with a specific religion or religions. Religious education aims to promote religious literacy, enabling individuals to understand and engage with religious ideas and perspectives. It provides opportunities for individuals to explore their own religious identity, as well as to develop an appreciation and respect for diverse religious traditions (Benefiel, Fry & Geigle 2014). Religious education can take various forms depending on the context. It can be formal, taking place in educational institutions such as schools, colleges, or seminaries, where it may be integrated into the curriculum or offered as an elective subject. It can also be informal, occurring within religious communities, families, or through personal study and exploration.

Gearon (2012) highlights the goals of Religious Education as follows:

> **Knowledge and Understanding:** Religious education seeks to provide individuals with a comprehensive understanding of the beliefs, teachings, practices, rituals, and historical contexts of a particular religion or religious traditions. It aims to develop a solid foundation of religious knowledge.
>
> **Spiritual and Moral Development**: Religious education often emphasizes the cultivation of spiritual and moral values, virtues, and ethical principles. It aims to foster personal growth, character development, and a sense of purpose and meaning in life.
>
> **Critical Thinking and Reflection:** Religious education encourages individuals to engage in critical thinking, reflection, and inquiry. It promotes the exploration of religious concepts, encourages questioning, and enables individuals to develop their own perspectives and interpretations.
>
> **Interfaith Dialogue and Understanding:** Religious education plays a role in promoting interfaith dialogue, mutual respect, and understanding among people of different religious backgrounds. It encourages individuals to

appreciate and learn from diverse religious traditions, fostering religious tolerance and cooperation.

Integration into Daily Life: Religious education aims to help individuals apply religious teachings and principles to their daily lives. It seeks to inspire ethical behavior, compassion, social justice, and a commitment to serving others.

In other words, religious education will contribute to personal and societal well-being by nurturing individuals' spiritual, moral, and ethical development. It will provide a foundation for religious literacy, interfaith dialogue, and the promotion of religious harmony and understanding in diverse societies (Baidhawy 2007).

Implications of the 4IR for Religious Education

Education in relation to religion in the 4IR aims to equip learners with the skills, mindset, and knowledge necessary to navigate and thrive in an increasingly technology-driven and interconnected world. While embracing emerging technologies and fostering essential competencies, individuals can seize the opportunities presented by the 4IR and contribute to spiritual, moral and societal advancements (Selwyn, 2023). Kayembe & Nel (2019) opined that the Fourth Industrial Revolution (4IR) is characterized by the rapid advancement of technologies such as artificial intelligence, robotics, and the Internet of Things (IoT) and has implications for religious education. Here are some potential impacts of the 4IR on religious education:

Access to information: The 4IR has facilitated easy access to vast amounts of information through the internet. Religious education can leverage this by providing online resources, digital libraries, and interactive platforms for students to explore religious texts, teachings, and diverse perspectives.

Personalized learning: Technological advancements enable personalized learning experiences tailored to individual students' needs and preferences. Religious education can utilize adaptive learning platforms, virtual reality simulations, and intelligent tutoring systems to engage students and enhance their understanding of religious concepts.

Global connections: The 4IR has fostered global connectivity, enabling religious education to transcend geographical boundaries. Students can interact with peers and religious leaders from different cultures and faith traditions, promoting interfaith dialogue, understanding, and tolerance.

Digital storytelling: Technology provides innovative ways to convey religious narratives and teachings. Religious education can employ multimedia platforms, interactive apps, and augmented reality to create immersive storytelling experiences, making religious texts and stories more engaging and accessible to students.

Ethical considerations: The 4IR raises ethical questions and dilemmas that religious education can address. Discussions on the ethical implications of emerging technologies, such as artificial intelligence ethics or the responsible use of data, can be integrated into religious education curricula, encouraging critical thinking and ethical decision-making.

Faith communities and virtual spaces: The 4IR has facilitated the formation of virtual communities where individuals can connect, worship, and engage in religious practices online. Religious education can explore the dynamics of virtual faith communities, examining

their impact on traditional religious practices and fostering discussions on the balance between virtual and physical religious experiences.

Digital literacy and discernment: With the abundance of online information, religious education can emphasize digital literacy skills and critical thinking. Students need to develop the ability to evaluate the credibility and authenticity of online religious sources and navigate the complexities of digital spaces responsibly.

Challenges in Technological Advancements for Religious Education

The 4IR has its own risks associated with the development and use of new technologies. Careful planning is needed to mitigate these risks. Moreover, new risk management systems and processes will have to be implemented. This implies that the new technologies have the potential to change life in a positive manner. However, the world should not overlook the dangers and the negative impacts of these new technological advancements (Penprase 2018, 219). Invariably, Technological advancements present both opportunities and challenges for religious education. While technology can enhance the learning experience and facilitate access to religious resources, it also poses certain challenges that need to be addressed (Jegede, Diaka & Jacob 2021). Here are some challenges related to technological advancements in religious education:

Authenticity and Credibility: With the abundance of information available online, it can be challenging to verify the authenticity and credibility of religious content. Misinformation or misinterpretation of religious teachings can easily spread, leading to confusion or distortion of beliefs

Digital Divide: The digital divide refers to the unequal access to technology and the internet. Not all individuals or communities have equal access to technology or reliable internet connectivity, which can create disparities in accessing religious educational resources. This can hinder the inclusivity and reach of religious education initiatives.

Loss of Personal Connection: Technology-mediated religious education can sometimes lack the personal connection and interpersonal dynamics that are essential in religious learning. Face-to-face interactions, community participation, and mentorship are integral aspects of religious education that may be compromised in virtual or online settings.

Ethical Use of Technology: The ethical use of technology in religious education is a significant concern. Privacy, data security, and protecting sensitive information about individuals' religious beliefs and practices are crucial considerations when leveraging technology in religious education. Ensuring the responsible and respectful use of technology is paramount.

Adaptation and Integration: Integrating technology into religious education requires adaptation and training for teachers and educators. Some religious institutions may face challenges in adopting and effectively integrating technology into their existing educational frameworks. There may be resistance to change or a lack of technical expertise among educators.

Balancing Tradition and Innovation: Technological advancements may challenge traditional teaching methods and pedagogical approaches in religious education. Striking a balance between preserving religious traditions and embracing innovative technological tools can be a delicate task, requiring careful consideration and adaptability.

Challenges of Religious Education in the Era of 4IR in Nigeria

Nigeria, like many other countries, faces several challenges in relation to the Fourth Industrial Revolution (4IR) and religious education. Here are some specific challenges in Nigeria:

Technological Infrastructure: Technological infrastructure plays a crucial role in a country's ability to embrace and leverage the opportunities presented by the Fourth Industrial Revolution (4IR). In the context of Nigeria, the concept of technological infrastructure encompasses various aspects including digital literacy, supportive policy frameworks, internet connectivity and access to reliable electricity, remains a challenge in many regions (Kamba, 2011). Unequal access to technology hinders the widespread adoption of digital platforms and online resources for religious education, particularly in rural areas.

Digital Divide: The digital divide refers to the gap between individuals or communities who have access to information and communication technologies (ICTs) and those who do not. In the context of Nigeria, the digital divide poses significant challenges in terms of the Fourth Industrial Revolution (4IR) and religious education, with disparities in access to technology and digital literacy skills (Ojo, 2022). Many individuals, especially those from disadvantaged backgrounds, may not have the necessary devices or internet connectivity to fully engage in digital religious education initiatives, limiting their opportunities for learning and participation.

Content Localization: Content localization refers to the process of adapting digital content, such as websites, applications, and educational materials, to suit the cultural, linguistic, and contextual needs of a specific region or target audience. In Nigeria, Religious education often requires content localization to ensure cultural relevance and accuracy. Adapting digital resources and platforms to reflect Nigeria's diverse religious traditions and cultural contexts may be challenging, as there is a need for localized content that resonates with the Nigerian religious landscape, with collaborative efforts from religious organizations, educational institutions, language experts, and technology developers (Adogame, 2010).

Quality Control and Misinformation: Quality control and misinformation are significant challenges in Nigeria when it comes to the Fourth Industrial Revolution (4IR) and religious education. The proliferation of online platforms and social media raises concerns about the quality of religious education content and the spread of misinformation (Bak-Coleman et, al., 2021). Ensuring the accuracy and credibility of online resources becomes crucial, as individuals may encounter misleading or extremist interpretations of religious teachings.

Balancing Traditional and Technological Approaches: Balancing traditional and technological approaches in the context of the Fourth Industrial Revolution (4IR) and religious education is indeed a challenge in Nigeria. The integration of technology into religious education can bring numerous benefits, but it is essential to ensure that traditional approaches and values are not overlooked. Nigeria has a rich tradition of oral storytelling and communal learning, which may need to be balanced with the integration of technology in religious education (Greenlaw, 2015). Striking a balance between traditional teaching methods and technological advancements can be a challenge, ensuring that the essence and authenticity of religious practices are not compromised, but respect the cultural and religious diversity of its communities.

Preservation of Cultural and Religious Heritage: The preservation of cultural and religious heritage is indeed a challenge in Nigeria in the context of the Fourth Industrial Revolution (4IR) and religious education. The rapid advancements in technology and the digital age present both opportunities and challenges in preserving Nigeria's rich cultural and religious heritage. With the increasing digitization of religious texts and practices, there is a need to address concerns regarding the preservation of cultural and religious heritage. Ensuring the

respectful use of digital technologies in representing and disseminating religious teachings without infringing on sacredness or cultural sensitivities is a challenge that needs to be addressed (Manžuch, 2017).

Ethical Considerations: Ethical considerations in the context of the Fourth Industrial Revolution (4IR) and religious education present challenges in Nigeria. As technology becomes increasingly integrated into religious education, it is essential to address the ethical implications that arise. The 4IR raises ethical questions in religious education, such as privacy concerns, data security, and the responsible use of technology. Establishing ethical guidelines and frameworks to address these issues and protect individuals' rights and privacy is essential (Mpofu & Nicolaides 2019). Employing responsible use of technology, fosters inclusivity and fairness, and ensures that the integration of technology aligns with the ethical values and teachings of religious communities.

Teacher Training and Professional Development: Teacher training and professional development pose significant challenges in Nigeria in the context of the Fourth Industrial Revolution (4IR) and religious education. The rapid advancements in technology require educators to continuously update their skills and knowledge to effectively integrate technology into religious education. To effectively integrate technology into religious education, there is a need for adequate teacher training and professional development programs. Educators need support and resources to enhance their digital literacy skills and effectively utilize technology in their teaching practices (Finn, Swezey & Warren, 2010).

Addressing these challenges requires collaborative efforts between government, religious institutions, educational organizations, and technology providers. It involves investments in technological infrastructure, digital literacy programs, content localization, and the development of ethical guidelines. By overcoming these challenges, Nigeria can harness the benefits of the 4IR to enhance religious education and promote inclusive and informed religious practices (Signé, 2023).

Opportunities for Technological Advancement in Religious Education
Technological advancements offer numerous opportunities for enhancing religious education. In Nigeria, technological advancements offer unique opportunities to enhance religious education and address specific challenges faced in the context of the country. Here are some key opportunities for technological advancement in religious education in Nigeria:

Increased Access to Religious Resources: Technology can provide wider access to religious texts, scriptures, teachings, and resources for individuals and communities across Nigeria. Online platforms, digital libraries, and mobile applications can make religious texts and resources available in various Nigerian languages, promoting inclusivity and facilitating deeper engagement with religious teachings (Gardiner & Musto, 2015).

Distance Learning and Remote Education: Technology enables the delivery of religious education through online courses, webinars, and virtual classrooms. This can be particularly beneficial in Nigeria's vast and diverse geographical landscape, allowing individuals in remote or underserved areas to access quality religious education without the need for physical travel (Fouberg, Murphy & De Blij, 2015).

Preservation and Promotion of Indigenous Religious Traditions: Technological platforms can be used to document and preserve indigenous religious traditions in Nigeria. Online repositories, multimedia presentations, and interactive resources can ensure the conservation of cultural and religious practices, while also promoting understanding and appreciation among Nigerians and the wider global audience (Ambrose, T., & Paine, C. (2012). .

Community Engagement and Outreach: Social media platforms, websites, and mobile applications can serve as powerful tools for religious organizations and leaders to engage with their communities and provide timely updates, sermons, teachings, and announcements (Golan, 2015). Live streaming of religious services and events can foster a sense of community and enable individuals to participate remotely.

Language Localization and Translation: Technology can facilitate the localization and translation of religious educational materials into Nigerian languages. Digital tools, mobile applications, and online platforms can enable the translation of religious texts, scriptures, and educational resources, making them more accessible and relevant to diverse linguistic communities in Nigeria (Folaron, 2015).

Interactive and Immersive Learning Experiences: Virtual reality (VR), augmented reality (AR), and multimedia presentations can create immersive learning experiences, enabling learners to virtually visit historical religious sites, participate in simulated rituals, or engage with religious artifacts. These technologies can enhance understanding and foster a deeper connection with religious teachings and traditions.

Collaboration and Networking: Online platforms and social media can facilitate collaboration and networking among religious educators, scholars, and learners in Nigeria. Virtual conferences, webinars, and discussion forums can foster knowledge-sharing, research collaboration, and the exchange of ideas, leading to the growth and development of religious education in the country (Kluemper, Mitra & Wang 2016).

Mobile Learning and Offline Accessibility: Given the widespread use of mobile devices in Nigeria, mobile learning applications and offline accessibility features can be leveraged to provide religious education content to individuals who have limited or intermittent internet connectivity (Kaliisa & Michelle, 2019). Mobile applications can offer interactive quizzes, podcasts, audio lectures, and offline access to religious texts, enabling continuous learning and engagement

By embracing these opportunities for technological advancement in religious education, Nigeria can enhance the accessibility, inclusivity, and quality of religious learning experiences. However, it is important to address infrastructure challenges, digital literacy gaps, and ensure culturally sensitive content development to maximize the benefits of technology in religious education across the country (Hackett, 1998).

Conclusion

The 4IR is the latest industrial revolution, with an increased focus on ICT, technological advancement, innovation, and creativity. Concept of the 4IR, History of Industrial Revolution, Ideology of the 4IR and the characteristics of the 4IR were identified in this article, namely big data, AI, robotics, ICT, 3D printing, and quantum computing. Education in the Fourth Industrial Revolution (4IR), Concept of Religious Education and implications of the 4IR for Religious Education were considered in this article; challenges in technological advancements for Religious Education, challenges in Nigeria in terms of the 4IR and Religious Education. The 4IR offers, among others, opportunities for technological advancement in Religious Education such as Increased Access to Religious Resources, Distance Learning and Remote Education, Preservation and Promotion of Indigenous Religious Traditions, Community Engagement and Outreach, Language Localization and Translation, Interactive and Immersive Learning Experiences, Collaboration and Networking and Mobile Learning and Offline Accessibility.

References

Adogame, A. (2010). How God Became a Nigerian: Religious Impulse and the Unfolding of a Nation. *Journal of Contemporary African Studies*, *28*(4), pp: 479-498.

Agarwal, H. and Agarwal, R. (2017). First Industrial Revolution and Second Industrial Revolution: Technological Differences and the Differences in Banking and Financing of the Firms. *Saudi Journal of Humanities and Social Sciences, 2(11), pp:1062–1066.*

Alsedra, M.K. (2017). *Artificial Intelligence*. Kuwait: American University of the Middle East.

Baidhawy, Z. (2007). Building Harmony and Peace through Multiculturalist Theology-Based Religious Education: An Alternative for Contemporary Indonesia. *British Journal of Religious Education*, *29*(1), pp: 15-30.

Bak-Coleman, J. B., Alfano, M., Barfuss, W., Bergstrom, C. T., Centeno, M. A., Couzin, I. D., & Weber, E. U. (2021). Stewardship of Global Collective Behavior. *Proceedings of the National Academy of Sciences*, *118*(27), e2025764118.

Benefiel, M., Fry, L. W., & Geigle, D. (2014). Spirituality and Religion in the Workplace: History, Theory, and Research. *Psychology of Religion and Spirituality*, *6*(3), p: 175.

Chow-Miller, I. (2018). *Project Learning with 3D Printing: How Does 3D Printing Work*? New York: Cavendish Square.

De Mauro, A., Greco, M. and Grimaldi, M. (2015). What is Big Data? A Consensual Definition and a Review of key Research Topics. "AIP Conference Proceedings", 1644:97. Available at: https://aip.scitation.org/doi/ abs/10.1063/1.4907823.

De Saulles, M. (2017). The Internet of Things and Business. New York: Routledge. Eisenberg, M. 2013. 3D printing for children: What to Build Next? *International Journal of Child-Computer Interaction, 1*(1), pp: 7–13.

Eisenberg, M. (2013). 3D Printing for Children: What to Build Next? *International Journal of Child-Computer Interaction, 1*(1), pp: 7–13.

Erboz, G. (2017). How to Define Industry 4.0: The Main Pillars of Industry 4.0. "Paper presented at the 7th International Conference on Management (ICoM 2017)", At Nitra, Slovakia, 1–2 June.

Finn, D., Swezey, J., & Warren, D. (2010). Perceived Professional Development Needs of Teachers and Administrators in PS-12 Christian Schools. *Journal of Research on Christian Education*, *19*(1), pp: 7-26.

Gartner.com, (2016). IT Glossary. Available at: https://www.gartner.com/it-glossary/

Gearon, L. (2012). European Religious Education and European Civil Religion. *British Journal of Educational Studies*, *60*(2), pp: 151-169.

Greenlaw, J. (2015). Deconstructing the Metanarrative of the 21st Century Skills Movement. *Educational Philosophy and Theory*, *47* (9), pp: 894-903.

Hackett, R. I. (1998). Charismatic/Pentecostal Appropriation of Media Technologies in Nigeria and Ghana. *Journal of Religion in Africa*, *28*(3), pp: 258-277. https://arxiv.org/ftp/arxiv/ papers/1601/1601.04602.pdf.

IBM. (2019). What is Quantum Computing? Available at: https://www.research.ibm.com/ibm-q/learn/what-isquantum-computing/

Ionescu, I. (2018). The First Industrial Revolution and General Features of the World Economy between the 16th Century and 1780. *SEA – Practical Application of Science*, *6*(17), pp: 183–186.

Jegede, D., Diaka, R. P. E., & Jacob, O. N. (2021). Challenges Preventing the Use of Information and Communication Technology (s) for the Teaching and Learning of Christian Religious Studies in FCT, Abuja, Nigeria. *Central Asian Journal of Literature, Philosophy and Culture*, *2*(8), pp: 10-21.

Kaliisa, R., & Michelle, P. (2019). Mobile Learning Policy and Practice in Africa: Towards Inclusive and Equitable Access to Higher Education. *Australasian Journal of Educational Technology*, *35*(6), 1-14.

Kamba, M. A. (2011). ICT Competency Framework for Library and Information Science Schools in Nigeria: The Need for Model Curriculum. *International Journal of Library and Information Science*, *3*(4), pp: 68-80.

Karabegovi , I. and Husak, E. (2018). The Fourth Industrial Revolution and the role of industrial robots with focus on China. *Journal of Engineering and Architecture*, *6*(1), pp: 67–75.

Kayembe, C., & Nel, D. (2019). Challenges and Oopportunities for Education in the Fourth Industrial Revolution. *African Journal of Public Affairs*, *11*(3), pp: 79-94.

Kluemper, D. H., Mitra, A., & Wang, S. (2016). Social Media Use in HRM, In *Research in Personnel and Human Resources Management*. Emerald Group Publishing Limited, pp: 153-207.

Lee, M., Yun, J.J., Pyka, A., Won, D., Kodama, F., Schiuma, G., Park, H., Jeon, J., Park, K., Jung, K., Yan, M., Lee, S. and Zhao, X. (2018). How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation. *Journal of Open Innovation, 4*(21), pp: 1–24.

Manžuch, Z. (2017). Ethical Issues in Digitization of Cultural Heritage. *Journal of Contemporary Archival Studies*, *4*(2), p: 4.

Marshall, S. (2016). Technological Innovation of Higher Education in New Zealand: A Wicked Problem? *Studies in Higher Education*, *41*(2), pp: 288–301.

Microsoft, (2019). What is Quantum Computing? Available at: https://www.microsoft.com/en-us/quantum/what-is-quantum-computing

Mpofu, R., & Nicolaides, A. (2019). Frankenstein and the Fourth Industrial Revolution (4IR): Ethics and Human Rights Considerations. *African Journal of Hospitality, Tourism and Leisure*, *8*(5), pp: 1-25.

Ojo, T. A. (2022). Digital Financial Inclusion for Women in the Fourth Industrial Revolution: A Key towards Achieving Sustainable Development Goal 5. *Africa Review*, *14*(1), pp: 98-123.

Pedron, Z. (2018). The Skills Revolution of the 21st century: It's Time to Re-Calibrate. *On Research (Journal of EU Business School)*, *1*, pp: 20-28.

Penprase, B. E. (2018). The Fourth Industrial Revolution and Higher Education. *Higher Education in the Era of the Fourth Industrial Revolution*, *10*(1), pp: 978-981.

Perez, J.A., Deligianni, F., Ravi, D. and Yang, G.Z. (2018). *Artificial Intelligence and Robotics.* London: UK-RAS Network.

Roberts, B.H. (2015). The Third Industrial Revolution: Implications for Planning Cities and Regions. Urban Frontiers Working Paper. Tudun Wada: Urban Frontiers.

Rotatori, D., Lee, E. J., & Sleeva, S. (2021). The Evolution of the Workforce During the Fourth Industrial Revolution. *Human Resource Development International*, *24*(1), pp: 92-103.

Satpathy, S., Dash, K. K., & Mohapatra, M. (2020). A Study on the New Design Thinking for Industrial Revolution 4.0, Requirements and Graduate Readiness. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, *12*(4).

Schwab, K. (2016). The Fourth Industrial Revolution. Geneva: World Economic Forum

Selwyn, N. 2023. Lessons to Be Learnt? Education, Techno-solutionism, and Sustainable Development. *Technology and Sustainable Development*, p: 71.

Signé, L. 2023. *Africa's Fourth Industrial Revolution*. Cambridge University Press.

Skilton, M. and Hovsepian, F. 2018. The Fourth Industrial Revolution: Responding to the Impact of Artificial Intelligence on Business. Basingstoke: Palgrave Macmillan.

Stearns, P.N. (2018). The Industrial Revolution in World History. (4th ed.). New York: Routledge.

Taylor-Sakyi, K. (2016). Big Data: Understanding Big Data. Available at:

Vries, P. 2008. Encyclopedia of the Modern World. Vol. 4. Oxford: Oxford University Press.

Xu, M., David, J.M. and Kim, S.H. (2018). The Fourth Industrial Revolution: Opportunities and challenges. International Journal of Financial Research, *9*(2), pp: 90–95.