UNIJERPS
Unizik Journal of Educational Research and Policy Studies VOL.17 (2); ***January-June, 2024*** https://unijerps.org
2023 Impact Factor: **6.834;** 2022 ***Impact Factor***: 5.156; ***2021 Impact Factor: 5.641;***
2020 Impact Factor: 5.355. *Indexing and Impact Factor URL: http://sjifactor.com/passport.php?id=21363*

PARTNERSHIP AND COLLABORATION BETWEEN LIBRARIES AND INDUSTRIES IN ENHANCING ARTIFICIAL INTELLIGENCE EDUCATION

Okoye Chidimma Ogechukwu
chidimmaogechukwu246@gmail.com.name
ICT Librarian
Faculty of Law Library Chukwuemeka Odumegwu Ojukwu University
Igbariam Campus, Anambra State, Nigeria

ABSTRACT
The use of AI in libraries and the promotion of AI education in Nigeria are facing several challenges that are impacting their ability to make a widespread impact in improving AI education. These challenges include inadequate infrastructure, poor funding, inadequate teachers teaching AI and many others. This has prompted the need to partner with industries to enhance AI education in Nigeria such as partnering and collaborating industries on curriculum development, workshops, internship and mentorship programmes, access to industrial tools and resources and many others. This has become necessary because a library that is welcoming and open to everyone is really important for schools and communities. Libraries give people a chance to read and learn without having to spend a lot of money. This helps a lot with learning how to read, getting a good education, doing research, and always wanting to learn new things.

Keywords: Artificial Intelligence, AI Education, Industries, Education

Introduction
A library that is welcoming and open to everyone is really important for schools and communities. Libraries give people a chance to read and learn without having to spend a lot of money. They have all sorts of things like books, magazines, newspapers, and even digital stuff like old pictures and videos. This helps a lot with learning how to read, getting a good education, doing research, and always wanting to learn new things.For most people, a library is a peaceful place where you can find lots of interesting things to read and study. It is a place where anyone, no matter how old you are, can discover different topics, from fun stories to serious research. Libraries are also like meeting spots where people can come together, attend events, and join in on educational activities.

From a professional standpoint, a library assumes a pivotal role as an educational and research institution dedicated to disseminating knowledge comprehensively. It transcends a mere collection of books, encompassing digital assets, scholarly journals, archival materials, and specialized databases. Libraries function as information repositories that serve the populace by providing pertinent information that benefits individuals and society as a whole. Additionally, according to Ari (2017), libraries are recognized as interactive platforms where individuals interact with

information, aiming to satisfy their informational and social needs. They play a critical role in preserving a nation's cultural heritage, particularly in the contemporary era marked by an abundance of information. Libraries contribute significantly to society by curating and disseminating relevant information as per the evolving needs of the populace.Furthermore, libraries are esteemed as cultural and informational hubs with a primary objective of fostering and preserving culture and knowledge. They are envisioned as repositories housing vast amounts of information, primarily accessible to citizens through book borrowing or printed materials.

Libraries are closely connected to society, as pointed out by Ari (2017), and they exist to serve the needs of the people. They play a crucial role in shaping our communities by sharing knowledge through books and other materials. For adults, especially those who could not continue formal education, libraries offer a valuable alternative for learning, providing flexible opportunities and support. While libraries have evolved beyond just books and computers, they remain places where people gather to explore, interact, and imagine. According to Edwards, Rausco, and Unger (2013), libraries serve various roles such as building communities, offering resources for diverse populations, supporting arts and culture, acting as educational hubs, and advocating for youth. In today's information era, where information is a key factor of production, libraries are central in spreading knowledge and fostering an informed and productive society.

In the digital age, libraries also play a crucial role in promoting digital inclusion. They provide access to computers, internet connectivity, digital tools, and training, bridging the gap between those who have access to technology and those who do not. As mentioned by Oyetola, Oladokun, Maxwell, and Akor (2023), libraries worldwide, including in developing nations like Nigeria, have embraced technology to improve their services and operations. This includes integrating cutting-edge technologies like artificial intelligence (AI) into their delivery services.AI is a significant part of the fourth industrial revolution, as highlighted by Park (2018), and its applications are evident across various sectors globally. Libraries are also adopting AI technologies to enhance their services, making librarianship a profession that embraces innovation and technological advancements. This trend reflects the evolving nature of libraries and their commitment to staying relevant in a rapidly changing digital landscape.

Artificial Intelligence (AI)

Artificial intelligence (AI) is a term that has been around since the 1950s, referring to machines' ability to do tasks that normally require human thinking. This includes things like self-driving cars, robots, AI chatbots like ChatGPT, and creating images using AI algorithms (Diaz, 2023). In simple terms, AI is about making computers do smart things that we typically associate with human intelligence. As Okpokwasili (2019) explains, AI is a field of computer science focused on creating machines that can behave intelligently, like understanding language,

recognizing speech, solving problems, and even learning from experience. There are different areas of AI research, such as expert systems, fuzzy logic, artificial neural networks, evolutionary algorithms, image processing, natural language processing, speech recognition, and robotics. These areas often work together in intelligent systems to tackle complex problems.

Benhamou and Janin (2018) describe AI as a set of technologies that enable machines to act with high intelligence, similar to humans. This includes making decisions, processing data, interacting with the environment, and even performing tasks like robots. AI is about making computers and machines think and act intelligently, like humans, as Duggal (2023) and Nwakunor (2021) also note. In essence, AI is about creating intelligent machines or systems that can think, learn, and solve problems like humans do, as Liu (2016) suggests. It involves leveraging computer technology to mimic human intelligence and perform tasks that would typically require human intervention.

Libraries and the Use of Artificial Intelligence

In recent times, libraries have undergone significant changes, evolving from simple information repositories to dynamic hubs powered by the digital revolution. This transformation has been driven by modern technologies that enable rapid access to information without any geographical constraints (Igwesi, 2010). With the advent of smart and intelligent technological advancements, libraries are now becoming centers of information intelligence, knowledge organization, service enhancement, and efficient management methods (Yu et al., 2019). These cutting-edge technologies include Internet of Things (IoT), big data analytics, cloud computing, blockchain, Radio Frequency Identification (RFID), artificial intelligence (AI), and virtual/augmented reality, among others.

These intelligent library systems not only assist library staff but also provide knowledge-based support to library users (Asemi and Asemi, 2018). In Nigeria, libraries have experienced significant growth and development due to the integration of Information and Communication Technologies (ICTs) into their operations and services. Academic libraries in Nigeria now utilize various technologies such as computers, scanning/printing machines, barcode readers, internet access, databases, Online Public Access Catalogue (OPAC), CCTV cameras, social media platforms, multimedia resources, and the recent adoption of Radio Frequency Identification (RFID) technology, among others (Ogwo, Ibegbulem & Nwachukwu, 2023).

Asefeh and Asemi (2018) explain that AI can help libraries improve their services in different ways, like handling book loans, organizing shelves, and categorizing materials. AI can also add descriptions to items and help with searches that aren't just text. Fernandez (2016) mentions that AI has potential in analyzing big data, creating descriptions, translating searches, and connecting search results. Abayomi et al. (2021) also suggest that AI can create programs for better reference services,

scanning books, and sorting subjects. Additionally, AI can assist users in finding materials through smart systems and automated services. Overall, AI adoption in libraries will lead to better information processing and faster access, benefiting both library staff and users.

Sivarajah et al. (2017) highlight that using AI in libraries allows for better analysis of large datasets and reduces repetitive tasks. This means AI can help libraries do things beyond human capabilities. However, some libraries, including university libraries in developing countries like Nigeria, have been slow to adopt digital technologies and show resistance to using technology in various library tasks (Wheatley & Hervieux, 2019). Yusuf et al. (2022) also suggest that AI can improve reference services, scanning books, and sorting subjects, along with assisting users in finding materials through smart systems and automated services. Therefore, integrating AI in libraries will lead to improved information processing and faster access, making both library staff and users happy.

Yusuf et al. (2022) mentioned that artificial intelligence (AI) has helped solve important challenges in libraries, like organizing books, cataloging materials, and acquiring new items. This has made library services more effective and efficient, leading to happier users who can access information quickly and accurately. AI in libraries also makes materials easier to find and allows staff to answer questions about using AI. Tella (2020) emphasized the need for academic libraries to take advantage of AI to improve services in the digital age, while Talley (2016) stressed the importance for university librarians to use AI for better services. Grant and Camp (2018) noted that many academic libraries in developed countries are already using AI for tasks like book loans and reference services.

Libraries and the Promotion of Artificial Intelligence Education

Libraries are like the heart of a school or college, providing information to everyone regardless of their background, beliefs, or age. Over time, they've evolved from just having books to including audiotapes, videos, databases, digital materials, and now even using artificial intelligence (Vijayakumar & Vijan, 2011). Libraries can be crucial in promoting AI education by collecting books, journals, research papers, and online resources about AI. These resources cover topics like machine learning, data science, algorithms, AI ethics, and how AI is used in different industries. Giving access to these resources helps students, teachers, researchers, and anyone interested learn about AI and stay updated on new developments.

Moreover, libraries can offer digital learning platforms and online courses specifically focused on AI education. These platforms might have interactive lessons, videos, coding practice, and AI projects to work on. According to Sagarjit et al. (2001), using AI has made learning more engaging all around the world. By working with educational tech companies or creating their own digital resources, libraries can make AI education easier and more interesting for learners of all

backgrounds and ages. Additionally, libraries can organize workshops, training sessions, and talks about AI. These events can include guest speakers, experts from the industry, and AI professionals who share their knowledge and experiences. Hands-on training, coding challenges, and AI competitions hosted by libraries can help people learn practical skills and collaborate with others. As Woods and Evans (2018) mentioned, using AI in library tasks can make library services more efficient, drive innovation, boost librarians' productivity, and improve the overall library experience for users.

Libraries can connect with the local community through various activities like outreach programs, public talks, and campaigns to raise awareness about AI. These efforts aim to improve people's understanding of AI, discuss ethical issues, and start conversations about how AI affects society. Libraries can team up with schools, colleges, businesses, government offices, and nonprofit groups to build a network of AI education partners. They can also host workshops, training sessions, and talks about AI. These events may include guest speakers, experts from different industries, and AI professionals sharing their knowledge and experiences. Hands-on training, coding workshops, and AI competitions organized by libraries can also be very helpful. Moreover, libraries can achieve these goals more effectively with AI's support. Divayana et al. (2015) pointed out some benefits of using AI in libraries, like improving efficiency in carrying out library tasks. With AI, libraries can complete tasks much faster than if done manually by humans.

Challenges of the Adoption of AI on the Promotion of AI Education in Nigeria

The use of AI in libraries and the promotion of AI education in Nigeria are facing several challenges that are impacting their ability to make a widespread impact in improving AI education. Despite the potential benefits of AI in libraries, according to Yusuf et al. (2022), libraries in Nigeria have not yet fully embraced and put AI into practice. One major obstacle in Nigeria is the lack of proper infrastructure and access to technology in many areas. Issues like limited internet access, unreliable electricity supply, and not enough digital devices make it difficult for students to effectively use AI education resources and platforms. It's crucial to address these infrastructure gaps to ensure that AI education is accessible to everyone across the country.

Another challenge is the insufficient funding for AI programs in Nigeria. Having enough funding and ensuring the long-term sustainability of AI education initiatives are key to their success. Getting financial support from the government, private sector partners, charitable organizations, and international donors can help in developing, implementing, and expanding AI education programs. It's also important to have plans for sustainability, monitoring progress, and evaluating the impact of AI education efforts over time. Yusuf et al. (2022) point out that when government budgets are shrinking and there are changes in politics or the economy, cultural institutions like libraries are often the first to face budget cuts. There's a constant struggle to secure funding from institutions or the government, especially when libraries

need to demonstrate value for money and show that they're using cost-effective methods. However, without investing in new technologies to upgrade their spaces, provide new services, and enhance the user experience, libraries cannot meet the needs of today's patrons, and all of this requires additional funding (Tella, 2020).

Nigeria is facing a shortage of well-trained educators with expertise in AI and related fields. It's crucial to train and keep skilled teachers, researchers, and industry professionals in AI education to provide students with quality teaching, guidance, and mentorship. Collaboration between universities, businesses, and the government can help build a capable workforce in AI. According to Yusuf et al. (2022), libraries need new skills for AI, such as better digital know-how, faster access to the most relevant resources, and support for hands-on learning activities to improve patrons' learning experiences. However, due to a lack of skilled experts, it's challenging for libraries to enhance AI education.

Furthermore, integrating AI education into existing curricula faces challenges like rigid educational structures and limited resources for curriculum development and teacher training. There's a need to update curricula to include AI concepts, skills, and competencies across different educational levels, from primary schools to universities. Professional development programs for educators can also improve their ability to teach AI-related subjects effectively.

Library Partnership and Collaboration with Industries to Enhance AI Education in Nigeria

Libraries are facing numerous challenges when it comes to improving AI education, so it's important for them to partner so as to team up and work closely with industries to boost AI education in schools. Libraries can play a key role in fostering collaboration between academic institutions and industries to enhance AI education. By tapping into industry knowledge, resources, mentorship, and partnership opportunities, libraries can offer students comprehensive AI learning experiences that prepare them for successful careers in the AI field. Here are some ways libraries can partner and collaborate with industries to enhance AI education:

Industry Expertise in Curriculum Development: Libraries can partner with AI companies and experts to create curriculum materials, lesson plans, and educational resources focused on AI. Industry professionals can share their insights into current industry practices, real-world AI applications, and emerging trends, ensuring that educational content remains relevant, updated, and meets industry standards. This means, by working together, libraries and industries can bridge the gap between academic learning and real-world AI applications, providing students with the knowledge and skills needed to thrive in the AI field.

Guest Lectures and Workshops: Libraries can arrange for industry professionals to give talks and lead workshops on AI-related topics. These sessions can cover various

areas such as machine learning, data analysis, AI ethics, robotics, and language processing. By having industry experts share their knowledge, experiences, and real-world examples, students can deepen their understanding of AI concepts and how they are used.

Internship and Mentorship Programmes: Libraries can also set up internship and mentorship programs in collaboration with AI companies. Students get hands-on experience by working on AI projects, doing research, and solving actual problems under the guidance of industry mentors. These programs offer insights into industry practices, help students build professional connections, and improve their chances of finding jobs in the AI field.

Access to Industry Tools and Resources: Libraries can team up with AI companies to offer students access to industry tools, software, data sets, and platforms. This collaboration lets students try out AI technologies, practice coding, create AI models, and analyze data. Libraries can set up AI labs, maker spaces, or innovation centers with top-notch tools and resources for hands-on learning.

Collaborative Projects and Competitions: They can also organize collaborative AI projects and competitions involving students, teachers, and industry partners. These projects may tackle real-world issues, develop AI solutions for social good, or explore the latest AI applications. Industry sponsors can provide support, mentorship, and prizes, encouraging creativity and innovation among participants.

Industry Advisory Boards: Libraries can also form industry advisory boards made up of AI professionals, educators, researchers, and policymakers. These boards offer strategic advice, feedback, and suggestions on AI education programs, curriculum development, program assessment, and industry-academia collaborations. Industry advisors bring valuable insights into industry needs, skill requirements, and job market trends.

Collaborative Research and Innovation: Libraries can team up with AI companies to work together on research projects, innovation programs, and technology sharing efforts. By joining forces, they can dive into AI progress, create new algorithms, analyze data, and share their research discoveries. Collaborating with industries can also result in turning AI innovations into marketable products and launching new startup businesses.

Conclusion

A library that is welcoming and open to everyone is really important for schools and communities. Libraries give people a chance to read and learn without having to spend a lot of money. This helps a lot with learning how to read, getting a good education, doing research, and always wanting to learn new things. Libraries are also adopting AI technologies to enhance their services, making librarianship a profession that embraces innovation and technological advancements. This trend reflects the

evolving nature of libraries and their commitment to staying relevant in a rapidly changing digital landscape. Artificial intelligence (AI) has helped solve important challenges in libraries, like organizing books, cataloging materials, and acquiring new items. This has made library services more effective and efficient, leading to happier users who can access information quickly and accurately.The use of AI in libraries and the promotion of AI education in Nigeria are facing several challenges that are impacting their ability to make a widespread impact in improving AI education. These challenges include inadequate infrastructure, poor funding, inadequate teachers teaching AI and many others. This has prompted the need to partner with industries to enhance AI education in Nigeria such as partnering and collaborating industries on curriculum development, workshops, internship and mentorship programmes, access to industrial tools and resources and many others.

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