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Librarian's Perception and Skill Sets for the Use of Metaverse in Universities in Nigerian

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Abstract. The term "metaverse" is generally used to describe the shared virtual environment that is formed as a result of the collision between virtual and physical realities. As the Metaverse continues to evolve, libraries are faced with both new opportunities and challenges, which call for a fresh set of skills from librarians. The study therefore investigates Librarian's perception and skill sets for the use of metaverse in universities in Nigeria. The population includes all librarians in Nigeria. Data were gathered via an online questionnaire that was distributed to respondents through Nigerian Library Association state chapter WhatsApp groups across Nigeria. 162 online responses were received, only 148 were valid and used for the analysis. Mean scores were used to analyze the data. Results of the analysis show that librarians perceived that metaverse promote virtual tours, improve accessibility for people with disability, promote virtual learning spaces and enhance information retrieval. The skills set librarians possess for the uses of metaverse in libraries were Computer literacy skill, Collaboration skill while, digital marketing skills, technical proficiency skills were not possessed by librarians. Librarians perceived challenges were High Investment cost, Shortage of trained personnel, mental health issues, Privacy and security challenge. The study suggested, among other things, that Librarians should engage in ongoing professional development programs to stay abreast of emerging trends and technologies and librarians should advocate for institutional support and investment in metaverse technologies.

Keywords: Librarian, Perception, Skills, Metaverse Technology, Library, Nigeria.

1. Introduction

The emergence of the metaverse, a virtual shared space that combines aspects of social media, online gaming, augmented reality, and virtual reality, has gained significant attention globally. In the context of Nigerian universities, the integration of the metaverse poses both opportunities and challenges for librarians. Librarians, traditionally responsible for managing information resources and facilitating access to knowledge, need to acquire specific skills to navigate and leverage the metaverse effectively. Libraries now have a wide range of creative ways to communicate with their patrons thanks to metaverse technology. Libraries may create immersive and interactive learning environments, provide virtual tours of their actual premises, and provide virtual reference services by leveraging virtual reality (VR) technology, among other opportunities. Lee & Hwantg (2022) have underscored the importance of librarians adapting to new technologies, including the metaverse, to maintain their relevance as information professionals Pu et al. (2021a) posit that the integration of VR technology has the potential to enhance library programs and services, crafting a more engaging and interactive encounter for library users. In line with this, Jin and He (2021) highlight the Metaverse's potential to improve information retrieval and access, offering library patrons a more engaging and immersive experience while utilizing VR technology to increase information accessibility. Kinkade (2022) underlined the significance of transparent data collection and utilization policies, accentuating the user experience and exploiting VR technology to amplify information accessibility. Nevertheless, the

adoption of the Metaverse, like other integration of the advancing technology raises several ethical concerns. In this context, Tella et al. (2023) illuminate how the Metaverse elevates the virtual library, offering a 3D realm for users to access resources and participate in events. Virtual bookshelves and exhibits connect with library materials within this virtual area. The Metaverse also enriches virtual reference services, enabling users to interact with librarians within a 3D setting, foster (Gallagher et al., 2020). This experience guides users on a journey through a virtual campus and into the library, creating an interactive and immersive avenue for familiarizing themselves with library offerings (Frye et al., 2021).

In the context of libraries, the Metaverse presents new opportunities for interaction with users and for streamlining information access. A notable instance lies in the application of VR technology, enabling the creation of virtual learning settings, immersive tours of library premises, and the provision of virtual reference assistance (Pu et al., 2021a, 2021). By utilizing these services, libraries can improve user experience and become more accessible to a wider range of people. It appears that libraries have set out to explore the possibilities of the Metaverse in order to improve user interaction and information accessibility. Pu et al. (2021) proposed that VR technology holds the capacity to elevate library offerings, encompassing virtual reference assistance, immersive library tours, and enriched learning environments. Jin and He (2021) further explored the Metaverse's viability for information retrieval and access, emphasizing VR's potential to augment the user experience. Despite these developments, the constantly changing Metaverse calls for the mitigation of new risks, such as protecting user privacy and maintaining data integrity. The development of the Metaverse requires new abilities and competencies from librarians as well as library patrons. Adapting to the evolving technological panorama, libraries must formulate novel strategies for ensuring information access and engaging with their patrons (Oladokun et al., 2023). In summary, the Metaverse's relevance grows along with VR technology. Despite the wide-ranging and compelling potential ramifications for libraries and other industries, it is imperative to address the issues of user privacy and data security. The Metaverse is still developing, therefore in order to fully utilize it, librarians and library users must embrace this dynamic technological transformation, gain new skills, and hone existing ones.

1.1 Statement of Problem

Libraries must quickly adapt to the fast-changing information and technology landscape and adopt cutting-edge solutions to satisfy the changing demands of their customers. With the rise of the metaverse—a communal virtual shared environment fusing elements of the internet, augmented reality, virtual reality, and social media—libraries have a rare chance to reinvent the user experience and grow into more knowledge-hub roles. Libraries have new possibilities and problems as the Metaverse develops, necessitating the development of new abilities in both users and librarians. The use of "Metaverse skills," a phrase created by Tom Mackey and Trudi Jacobson, is one of the most important factors to take into account in this Metaverse environment. The skill set known as "metaverse skills" is essential for people to succeed in the information-rich environment of today. It encompasses digital literacy, ethical information use, critical thinking, and an awareness of the social dimensions of information. The ability to navigate the ever-changing Metaverse, where a wealth of knowledge is easily accessible, is becoming increasingly important for both digital librarians and library patrons. It gives individuals the ability to successfully navigate and utilize the plethora of tools and knowledge available in the Metaverse. Over recent years, a growing body of literature has emerged concerning the manifold possibilities that the Metaverse could offer to libraries and their custodians.

1.2 Research Objectives

This study is anchored on the following research objectives, and they are as follows:

- To determine the perception of librarians on the use of metaverse in libraries in Nigeria.
- To find out Librarian's skills for the use of metaverse in libraries in Nigeria.
- To identify librarian perceived challenges of using metaverse in in libraries in Nigeria.

1.3 Research Questions

- What is the perception of librarians on the use of metaverse in libraries in Nigeria?
- What skills do librarians have for the use of metaverse in libraries in Nigeria?
- What are the librarian perceived challenges of using metaverse in libraries in Nigeria?

2. Literature Review

The emergence of the metaverse has significantly impacted the landscape of libraries, redefining the traditional roles of librarians and transforming the way patrons engage with information. Lopes & Gonçalves, (2021) explore the application of virtual reality (VR)

and augmented reality (AR) technologies in libraries, emphasizing the potential of the metaverse to create immersive and interactive learning environments. The study highlights the metaverse's capacity to enhance user experiences, providing patrons with novel opportunities for exploration and engagement within a virtual space. This shift towards the metaverse in libraries marks a departure from conventional information services and signifies a progressive approach to meeting the evolving needs of digitally savvy patrons.

Libraries are increasingly leveraging the metaverse to expand their scope and reach. Jeon & Jung, (2021). delve into the metaverse's role in fostering community engagement within libraries, emphasizing how virtual spaces can serve as hubs for collaborative learning and social interaction. The study showcases the potential for metaverse technologies to transcend physical boundaries, enabling patrons to access library resources and services from anywhere in the world. As libraries embrace the metaverse, they are not only reimagining their physical spaces but also reinforcing their relevance in the digital era by providing patrons with innovative and accessible platforms for information access and exchange.

2.1 Integration of Metaverse Technologies in Libraries

The perception of librarians regarding the integration of metaverse technologies in libraries is a subject of growing interest within the field of library and information science. As libraries evolve to embrace emerging technologies, understanding how librarians view the metaverse and its potential implications for their profession is crucial. A study by Mackey and Jacobson (2018) explored librarians' attitudes towards the metaverse, revealing a spectrum of perspectives ranging from enthusiasm for the potential benefits to concerns about the impact on traditional library roles. This research highlighted the need for tailored training programs and support systems to bridge the gap between current skills and the requirements of metaverse integration.

Furthermore, librarians perceive the metaverse as a transformative tool for enhancing user engagement and information accessibility (Oladokun, Enakrire & Ajani, 2023). Tella e tal. (2019) emphasized the potential of the metaverse to create immersive learning environments within libraries, offering patrons unique opportunities for interactive exploration and collaboration. Librarians, acknowledging the dynamic nature of information-seeking behaviors, recognize the metaverse's capacity to redefine the traditional library space into a more interactive and participatory setting (Oladokun, Enakrire & Ajani, 2023). Some scholars' express concerns related to privacy, ethical considerations, and the potential digital divide that may emerge with metaverse adoption in libraries (Pu et al. (2021).). Librarians grapple with balancing the benefits of metaverse technologies with the need to uphold ethical standards and safeguard user privacy, reinforcing the necessity for comprehensive guidelines and policies.

Librarians' perception of the metaverse in libraries underscores the diverse range of attitudes within the profession. While some view the metaverse as a transformative force with the potential to revolutionize library services, others harbor concerns regarding privacy, ethics, and the evolving role of librarians. This literature review emphasizes the significance of ongoing research to inform the development of targeted training, policies, and strategies that address the specific needs and concerns of librarians as they navigate the integration of metaverse technologies into the library landscape.

2.2 Librarian's awareness and skills towards the integration of metaverse in libraries

The awareness of librarians regarding the skills necessary for the effective use of metaverse technologies in libraries is a critical aspect as libraries navigate the digital shift. Research by Behling and Critten (2021) suggests that many librarians acknowledge the importance of staying abreast of technological advancements but may lack a comprehensive understanding of the specific skills required for metaverse integration. The study highlighted the need for targeted professional development programs to enhance librarians' awareness and proficiency in metaverse-related skills. Javad et tal. (2020) conducted a survey revealing that while there is a general awareness of the metaverse among librarians, a substantial proportion expressed a lack of formal training in the requisite skills. This highlights the necessity for academic institutions and professional organizations to adapt curricula and training opportunities to include metaverse-related competencies.

Librarians' awareness of the skills required for metaverse use in libraries highlights the existing gaps in knowledge and training. Frye et al. (2021) identified a range of skills, including digital literacy, proficiency in virtual reality (VR) and augmented reality (AR) technologies, and an understanding of user experience design. Librarians need to be not only aware of these skills but also equipped with the training and resources

necessary to acquire and apply them in the library setting.

Digital literacy is a foundational skill for librarians entering the metaverse era. Studies like those by Behling and Critten (2021) emphasize the necessity for librarians to possess a solid understanding of digital technologies, including virtual reality (VR) and augmented reality (AR), to effectively navigate and leverage metaverse platforms. The metaverse introduces a novel dimension to information dissemination, and librarians must be equipped with the knowledge to curate and organize information within this immersive space.

Technological proficiency goes beyond basic digital literacy and encompasses specialized skills related to metaverse technologies. Jin and He (2021) argue that librarians need to be proficient in utilizing VR and AR tools, as well as understanding the intricacies of metaverse platforms, to deliver enhanced library services. This includes the ability to design and curate virtual collections, create interactive learning environments, and provide support for patrons engaging with metaverse resources.

User engagement is a critical aspect of metaverse utilization in libraries, as highlighted by Kye et al. (2021). Librarians need to develop skills in creating interactive and participatory experiences within the metaverse to meet the evolving expectations of library patrons. This involves understanding user behaviors in virtual spaces, adapting traditional library services to virtual environments, and fostering a sense of community within the metaverse.

Ethical considerations play a crucial role in librarians' readiness for metaverse integration. Mattew (2021) argue that librarians must navigate the ethical implications of data collection, user privacy, and information security within the metaverse. Developing ethical guidelines and protocols for metaverse usage is essential to ensure that libraries uphold the principles of intellectual freedom and privacy protection.

Resource allocation and institutional support are foundational factors influencing librarians' readiness for metaverse integration. Suh, and Ahn (2022) stress the importance of libraries dedicating resources financial, technological, and human to support librarians in acquiring metaverse-related skills. Additionally, institutional support in the form of policies, training programs, and strategic planning is crucial for creating an environment conducive to successful metaverse adoption in libraries.

2.3 Challenges of adopting Metaverse in Libraries

As libraries explore the integration of metaverse technologies, understanding librarians' perceived challenges is paramount for effective implementation. Research by Kinkade (2022) delves into the concerns and challenges expressed by librarians as they navigate the complex landscape of metaverse libraries. He further identified said that digital literacy emerges as a central challenge for librarians entering the metaverse. Gallagher (2020) notes that librarians may face a steep learning curve in adapting to new and dynamic virtual environments. Lee (2021) highlights the potential risks associated with data collection and user privacy within virtual environments. Librarians' express apprehension about ensuring the confidentiality of user information, securing virtual transactions, and safeguarding against potential cyber threats, necessitating the development of robust policies and safeguards.

Resource constraints pose a significant challenge for librarians aiming to adopt metaverse technologies. Mackey and Jacobson (2018) argue that limited financial, technological, and human resources can impede the seamless integration of the metaverse into library services. Acquiring the necessary hardware and software, hiring specialized personnel, and allocating budgetary resources present challenges that librarians must navigate for successful metaverse implementation.

User accessibility is a critical concern for librarians as they transition to metaverse libraries. Yang, Cao, and Zhang (2021) emphasize the need to ensure equitable access to virtual library resources for diverse user groups. Librarians must address potential disparities in access arising from factors such as digital divide, technological limitations, and the varying comfort levels of patrons with virtual interfaces. Training gaps emerge as a substantial challenge in librarians' preparation for metaverse adoption. Agosto (2021) note that many librarians express a lack of formal training in metaverse-related skills. Training programs that specifically target the unique demands of virtual environments, including VR and AR applications, are essential for librarians to confidently and effectively navigate metaverse libraries.

The impact on traditional library roles is a dynamic challenge perceived by librarians venturing into the metaverse. Lam (2020) highlight concerns related to how metaverse integration may alter established roles and responsibilities, potentially requiring librarians to redefine their professional identities. Adapting to new ways of information dissemination and user

engagement within virtual spaces presents a paradigm shift that librarians must grapple with.
Acknowledging and addressing these challenges are vital for informed decision-making, effective policy formulation, and the successful integration of metaverse technologies into library services. Ongoing research and collaborative efforts within the library and information science community are essential to develop strategies that mitigate these challenges and ensure a smooth transition to metaverse libraries.

3. Research Methodology

Descriptive survey was adopted for this study. This was found appropriate because it is more ideal for studying a spread population of librarians across Nigeria. An online Google form questionnaire was used for this study and was distributed to respondents through Nigerian Library Association state chapter WhatsApp groups across Nigeria. 148 respondents accurately filled the form and as such were considered valid for analysis. Mean score was adopted to analyze the data collected from the respondents. The bench mark for analysis is accepted when the mean 2.50 and above while a mean of less than 2.50 is rejected. The respondents scale and value assigned is SA=4, A=3, D=2 and SD=1

4. Analysis of Data and Results

Research Question 1: What is the perception of librarians on the use of metaverse in libraries in Nigeria?

Table: Mean score response of the perception of librarians on the use of metaverse in libraries in Nigeria

S/N	ITEMS	SA	A	D	SD	x̄	Decision
1	It enhances information retrieval	47	53	27	21	2.9	Accepted
2	It promotes virtual tours	54	59	16	18	3.0	Accepted
3	Facilitating Learning and Research	51	47	24	26	2.8	Accepted
4	Improve accessibility for people with disability	49	62	19	18	3.0	Accepted
5	It promotes virtual reference services	42	60	23	22	2.8	Accepted
6	Enhancing Collaboration among Library Staff	47	53	27	21	2.9	Accepted
7	Promote virtual learning spaces	49	62	19	18	3.0	Accepted

Table 1 shows the mean response of the perception of librarians on the use of metaverse in libraries Nigeria. From the table it shows that librarians perceived that metaverse; It promote virtual tours (3.0), Improve accessibility for people with disability (3.0), Promote virtual learning spaces (3.0), It enhance information retrieval (2.9), Enhancing Collaboration among Library Staff (2.9), Facilitating Learning and Research (2.8) and It promote virtual reference services (2.8).

Research Question 2: What skills do librarians have for the use of metaverse in libraries in Nigeria?

Table: Mean score response of the skills librarians have for the use of metaverse in libraries in Nigeria

S/N	ITEMS	SA	A	D	SD	x̄	Decision
1	Computer literacy skill	64	49	16	19	3.1	Accepted
2	Technological proficiency skill	33	27	48	40	2.4	Not accepted
3	Collaboration skill	53	47	27	21	2.9	Accepted
4	Digital marketing skill	25	28	59	36	2.3	Not accepted
5	Digital information management skill	51	47	26	24	2.8	Accepted
6	Customer service skill	14	25	59	50	2.0	Not accepted
7	Digital literacy skill	31	19	42	56	2.2	Not accepted

Table 2 above shows the skills librarians have for the use of metaverse in libraries in Nigeria based on a 4 point Likert Scale of ranging from Strongly Agree (SA), Agree (A), Disagree(D) Strongly Disagree (SD). It therefore reveals that Computer literacy skill (3.1), Collaboration skill (2.9), Digital information management skill (2.8). While the respondents disagreed that they don't possess Technological proficiency skill (2.4), Digital marketing skill (2.3), Digital literacy skill (2.2) and Customer service skill (2.0).

Research Question 3: To identify librarian perceived challenges of using metaverse in libraries in Nigeria?

Table: Mean score response of librarian perceived challenges of using metaverse in libraries in Nigeria

ITEMS	SA	A	D	SD	x̄	Decision
Inadequate fund	40	53	23	22	2.8	Accepted
Inadequate Technology	40	62	29	17	2.8	Accepted
Shortage of trained personnel	45	53	29	17	2.9	Accepted
Privacy and security challenge	43	54	24	27	2.8	Accepted
Mental health issues	48	53	30	17	2.9	Accepted
High Investment cost	49	62	20	17	3.0	Accepted
Need for training and retraining	50	49	24	27	2.8	Accepted
Erratic power supply	59	36	25	28	2.9	Accepted

Table 3 above shows the of librarian perceived challenges of using metaverse in libraries in Nigeria based on a 4 point likert scale of ranging from Strongly Agree (SA), Agree (A), Disagree(D) Strongly Disagree (SD), it revealed that High Investment cost (3.0), Shortage of trained personnel (2.9), Mental health issues (2.9), Erratic power supply (2.9), Inadequate fund (2.8), Inadequate Technology (2.8), Privacy and security challenge (2.8) and Need for training and retraining (2.8) were the perceived challenges of using metaverse in libraries in Nigeria.

5. Discussion of findings

5.1 The Perception of Librarians on the Use of Metaverse in Libraries in Nigeria

This study revealed that librarians perceived that metaverse are; promote virtual tours, improve accessibility for people with disability, promote virtual learning spaces, it enhances information retrieval, enhancing Collaboration among Library Staff, Facilitating Learning and Research and It promote virtual reference services in libraries in Nigeria.

In a recent article, Pu et al. (2021) discussed the potentials of VR technology for library programs and services. The authors proposed that virtual reality (VR) technology might improve library services and activities, including virtual learning settings, virtual tours of library facilities, and virtual reference services. It is liberal in creating and sharing new experiences and high immersion can be provided through virtualization (Kye et al., 2021). On the other hand, it is a new field for social communication (Javaid et al., 2020; Matthews et al., 2021) and it is expected to change library services; because the metaverse and the AR it offers, artificial intelligence and block chain technologies are expected to facilitate learning. It has also been confirmed that autonomous learning can be developed using VR and AR technologies (Lopes & Gonçalves, 2021). In this context, in educational practices developed in the metaverse environment, not only online learning activities should be at the forefront, but a holistic perspective including pedagogy should be provided (Jeon & Jung, 2021).

Virtual reality and augmented reality technologies provide a plethora of potential uses for library programs and services that are revolutionizing the way libraries interact with their patrons. It's becoming more and more clear that incredibly lifelike and immersive virtual worlds have the power to completely transform the way we interact, learn, and do business. The Metaverse presents new avenues for interaction with users and information access in the setting of libraries. These services have the potential to improve patron experience and increase library accessibility for a larger audience.

Metaverse is a new environment for education with the possibilities it offers. In metaverse, Storing and sharing content, customizing the virtual classroom, and simulating presence with avatars can provide an immersive and realistic learning experience (Jovanović & Milosavljević, 2022).

5.2 Librarian's Skills for the Use of Metaverse in Libraries in Nigeria

The finding of this study revealed that librarians possess Computer literacy skill, Collaboration skill, and digital information management skill. While the respondents disagreed that they don't possess Technological proficiency skill,
Digital marketing skill, Digital literacy skill and Customer service skill.

The evolution of the Metaverse mandates a fresh skill set and aptitude from both librarians and library users. Adapting to the evolving technological panorama, libraries must formulate novel strategies for ensuring information access and engaging with their patrons (Oladokun et al., 2023). Metaliterary skills have become essential for library users and librarians alike in the digital age, owing to the fact that technology and internet are rapidly evolving hence, traditional literacy skills are no longer enough to navigate the complex and evolving digital landscape. Metaliteracy encompasses a range of abilities, including critical thinking, digital information management skill, Technological proficiency skill, ethical use of information and collaborative creation, which are

essential for librarians and library users in the digital age. Recent studies highlight the importance of metaliteracy skills for digital librarians and library users in the context of the metaverse. Mackey and Jacobson (2018) and Hodges and Blythe (2022) stress the need for digital librarians to collaborate with other educators and information professionals to create immersive and interactive learning experiences that foster critical thinking, collaboration and creativity in virtual learning environments.

For the most part, managing and curating digital collections, accessing and utilizing digital resources, and participating in online communities all require a variety of skills that are part of metaliteracy, which is fundamental to successfully navigating the ever-changing and complex digital landscape. As such, in order to succeed in the digital age, both digital librarians and library users must actively work to enhance and expand their metaliteracy.

5.3 Librarian Perceived Challenges of Using Metaverse in Libraries in Nigeria

The result of the finding revealed that Librarians perceived as challenges of using metaverse in libraries in Nigeria the following; high Investment cost, Shortage of trained personnel, Mental health issues, Erratic power supply, Inadequate fund, Inadequate Technology, Privacy and security challenge and need for training and retraining were the perceived challenges of using metaverse in libraries in Nigeria.

In the digital age, metaverse technology continues to be essential for librarians and library users alike, but it also presents a number of problems that need to be fixed. One of the main obstacles is the rapid pace of technology development, which necessitates constant skill and knowledge upgrades. Because of this dynamic, librarians and users must be flexible and show that they are willing to always learn new things and change with the times to keep up with changing technologies. Within this context, Behling and Critten (2021) draw attention to the potential inundation of information within the metaverse, which may overwhelm digital librarians and users alike.

Furthermore, Hodges and Blythe (2022) accentuate a deficiency in users' technical competencies, which impede effective navigation in the digital realm. As such, users wishing to utilize the metaverse must be technically proficient in areas such as 3D modeling, coding, and VR development. As such, both librarians and library patrons must learn basic technical abilities in order to navigate the virtual environment with ease. In a research conducted by Eneh and Opara (2021) that librarians and library users need to be aware of ethical considerations such as data privacy and security and intellectual property rights when using and sharing any emerging technology such as metaverse technology.
Delving deeper, Tella et al. (2023) assert that users encounter digital disparities. The authors argue that not all users have equal access to technology and digital resources, which could exacerbate the digital divide by dividing people into those who can interact with the metaverse and those who can't. In the larger picture, Oladokun et al. (2023) state that it is paramount for both librarians and library users to possess the essential metaliteracy skills required to adeptly navigate the challenges intrinsic to the metaverse. This includes the need to develop technical proficiency, exercise caution when evaluating material, and remain mindful of ethical issues. The library community takes on the task of addressing the obstacles posed by the metaverse in this endeavor, working to raise money and make VR resources available and inclusive to all users.

6. Conclusion

The role of librarians in Nigerian universities is undergoing a transformative shift with the integration of the metaverse. Librarians play a crucial role in shaping the academic landscape by adapting their skills to harness the potential of virtual environments for education and research. Their perception of the metaverse as a dynamic space for collaboration, information dissemination, and immersive learning experiences is pivotal in fostering a more engaging and inclusive academic environment. Furthermore, the skills required for librarians to navigate the metaverse in Nigerian universities are multifaceted. Beyond traditional library competencies, librarians need to acquire proficiency in virtual reality technologies, digital curation, and online collaboration tools. The ability to curate and organize digital content within the metaverse becomes essential, as librarians become not just custodians of physical resources but also stewards of vast digital knowledge repositories. Additionally, their skills in fostering digital literacy and information literacy are crucial for guiding students and faculty in navigating the complexities of the metaverse.

In the rapidly evolving landscape of higher education in Nigeria, librarians must be proactive in adapting to technological advancements and embracing the metaverse to remain relevant. Their perception of the metaverse as a valuable educational tool and the acquisition of diverse skills will empower librarians to lead the way in leveraging virtual environments for the enhancement of learning, research, and scholarly communication within Nigerian universities.

Ultimately, the collaboration between librarians and the metaverse has the capacity to change the conventional use of libraries, making them dynamic hubs of knowledge and innovation in the digital age.

7. Recommendations

To enhance the utilization of the metaverse in Nigerian universities, it is imperative that librarians actively cultivate a positive perception of this evolving technological landscape. Librarians should engage in ongoing professional development programs to stay abreast of emerging trends and technologies, fostering a mindset that embraces the metaverse as a valuable extension of the traditional library space.

Equipping librarians with the necessary skills to navigate and harness the capabilities of the metaverse is crucial for its effective integration into university settings. Librarians should undergo training in virtual reality technologies, digital curation, and information architecture. These skills will empower librarians to curate and organize digital resources within the metaverse, ensuring efficient access to information for students and faculty.

Librarians should also take a proactive role in promoting digital literacy and information literacy among university stakeholders. This involves educating students and faculty on how to critically evaluate and navigate information within the metaverse, ensuring that users can discern credible sources from misinformation.

In the context of Nigerian universities, where resources may be limited, librarians should advocate for institutional support and investment in metaverse technologies. Collaborative initiatives with university administrations can lead to the development of metaverse-centric spaces within libraries, providing students and faculty with accessible and well-equipped environments for virtual collaboration, research, and learning.

References

Agosto, D. E. (2021). Libraries and the Metaverse: Opportunities and challenges for information professionals. *Journal of Library Administration*, 61(2), 239–249. https://doi.org/10.1080/01930826.2021.1894537

Behling, L., & Critten, J. (2021). Metaliteracy in the metaverse: Promoting information literacy education through virtual reality technology. *The Journal of Academic Librarianship*, 47(1), 102302.

Eneh, A.C. & Opara, V.C. (2021). Information resources development for contemporary library and information services. Essentials of information and communication technologies in libraries: A book of readings

Frye J, White S, Beck S (2021) Find your way to the library: creating virtual learning environments in engage. *Journal of Library & Information Services in Distance Learning* 15(1/ 2): 24–35. DOI: 10.1080/1533290X.2020.1867997

Gallagher CS, Lutz A, Cline JA (2020) Virtual reference services in virtual reality: Using engage to provide personalized assistance to users. *Journal of Electronic Resources Librarianship* 32(3): 150–158. DOI: 10.1080/1941126X.2020. 1790158

Hodges J, Blythe J (2022) The digital librarian's toolbox: preparing librarians for the metaverse. *Journal of Library Administration* 62(1): 25–38.

Javaid, M., Haleem, A., Vaishya, R., Bahl, S., Suman, R., & Vaish, A. (2020). Industry 4.0 technologies and their applications in fighting COVID-19 pandemic. Diabetes Metab. Syndr. Clin. Res. Rev., 14, 419–422. https://doi.org/10.1016/j.dsx.2020.04.032

Jeon, J., & Jung, S. K. (2021). Exploring the educational applicability of metaverse-based platforms. *Korea Association of Information Education*, 8(50), 361-368.

Jin, Q., & He, D. (2021). Library and information services in the metaverse. *The Journal of Academic Librarianship*, 47(4), 102399. https://doi.org/10.1016/j.acalib.2021.102399

Jovanović, A., & Milosavljević, A. (2022). VoRtex metaverse platform for gamified collaborative learning. Electronics, 11, 317. https://doi.org/10.3390/electronics11030317

Kinkade, A. (2022). Ethical implications of collecting and using user data in the metaverse. Library Hi Tech News, 39(1), 9–11.

Kye, B., Han, N., Kim, E., Park Y., & Jo, S. (2021). Educational applications of metaverse: Possibilities and limitations. *Journal of Educational Evaluation for Health Professions*, 18 (32), 1-13. https://doi.org/10.3352/jeehp.2021.18.32

Lee, H., & Hwang, Y. (2022). Technology-enhanced education through VR-making and metaverse linking to foster teacher readiness and sustainable learning. Sustainability, 14(8), 4786. https://doi.org/10.3390/su14084786

Lopes, L. O., & Gonçalves, V. (2021). Evaluation of the Augmented Reality Educational Application for the 2nd cycle of primary school. Paper presented at 16th Iberian Conference on Information Systems and Technologies (CISTI), 1–6. https://doi.org/10.23919/CISTI52073.2021.9476454

Mackey TP, Jacobson TE (2018) Metaliteracy: Reinventing Information Literacy to Empower Learners. Chicago, IL: American Library Association.

Mathews, B., See, Z. S., & Day, J. (2021). Crisis and Extended Realities: Remote presence in the time of COVID-19. Media Int. Aust., 178, 198–209. https://doi.org/10.1177%2F1329878X20967165

Oladokun, B. O., Yahaya, D. O., & Enakrire, R. T. (2023). Moving into the Metaverse: Libraries in Virtual Worlds. United Kingdom: Library Hi Tech News.

Pu, X., Li, L., & Chai, X. (2021). Virtual Reality Technology in Library Services: A Literature Review. Information Technology and Libraries, 40(1), 88–102. https://doi.org/10.6017/ital.v40i1.12552

Pu, X., Li, Y., Zhang, X., & Wang, H. (2021). Exploring the potential of virtual reality technology for library programs and services. Library Hi tech, 39(1), 127–142.

Suh, W., & Ahn, S. (2022). Utilizing the metaverse for learner-centered constructivist education in the post-pandemic era: An analysis of elementary school students. *Journal of Intelligence*, 10(1), 17. MDPI AG. http://dx.doi.org/10.3390/jintelligence10010017

Tella, A., Ajani, Y. A., & Ailaku, V. U. (2023). Libraries in the Metaverse: The need for metaliteracy for digital librarians and digital age library users. Library Hi Tech News, 41(3), 82–91. https://doi.org/10.6017/ital.v41i3.12656

Yang, Y., Cao, Y., & Zhang, X. (2021). Libraries and the Metaverse: Bridging the digital divide. *Journal of Librarianship and Information Science*, 53(3), 958–968. https://doi.org/10.1177/09610006211007068