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META-LITERACY FOR LIBRARIANS AND USERS IN AN ERA OF METAVERSE TECHNOLOGY: LIBRARIANS POINT OF VIEW

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ABSTRACT

This study examines the need for metaverse technology in libraries and the importance of meta-literacy for librarians and library users in the digital era. The research, using a descriptive survey approach, targeted 8,200 librarians in Nigeria, excluding school librarians, and collected data through questionnaires. The study aimed to explore librarians' views on the benefits of metaverse in libraries, the need for meta-literacy, and potential challenges. Results showed that librarians recognized the potential of the metaverse to enhance library services but emphasized that both librarians and users must be meta-literate to effectively interact with digital information. Challenges included inadequate technological infrastructure and access to necessary equipment. The study recommends regular training for librarians and users, including workshops and online courses, to enhance meta-literacy skills and support the adoption of metaverse technology in Nigerian libraries.

Keywords: Metaverse, Librarian, Library User, Meta Literacy, information and communication technology, Virtual Reality.

Introduction

Man after creation has remained an enquirer trying to get the best out of his environment by applying knowledge as to harnessing the best around with a view to making life better. The quest to make the best out of life, has resulted in man applying scientific knowledge that has resulted to a global digital ecosystem in which the world is ruled by information propelled by the emergence of information and communication technology (IcT) and powered by computers. The irony of it all is that we are today living in a dynamic digital ecosystem in that no decade passes without an invention of a new technology with each coming with both sides of the coin (beautiful and ugly sides).

In recent time, more so after the insurgence of covid-19 and the associated social distancing, various technologies came to lame-light which has seen the birth of new concepts and terms with different approaches to making life more realistic, easy and pleasant. To this end, the world is not only talking of ICT but it is also today talking of new technological sensations like simulation of the human brain also known as artificial intelligence (AI), blockchain, avatar and one of the latest in the vocabulary of information communication technology, meta-verse. As revealed by Tucci and Moore (2024), the metaverse bubble popped in late 2022, about the time ChatGPT captured the world's attention. Ultimately, metaverse is perceived as the next evolution in social connection and the successor to the mobile internet. Like the internet, the metaverse will help one connect with people when not physically in the same place and get one even closer to that feeling of being together in person. While the internet is a network of billions of computers, millions of servers and other electronic devices that allow users can communicate with each other, view and interact with websites, and buy and sell goods and services. The metaverse doesn't compete with the internet. While the internet is used primarily for browsing, the metaverse offers a more immersive experience where people can "live" to a degree in virtual spaces. The growth of the internet has spawned many services that are shaping the metaverse indicating that metaverse builds on internet thus does not compete with it (Google cloud, 2024).

As asserted by Lubetsky (2022) in a talk at the MIT Platform Strategy Summit, the metaverse remains a domain of niche applications, used by consumers for entertainment and gaming but stopping well short of an all-encompassing virtual reality, controlled by large compe ting ecosystems such as the Apple and Android meta worlds with limited interoperability and it is a dynamic, open and interoperable space, much like the internet but in 3D while Kristensson (2022) describes it a**s** a merging of virtual, augmented and physical reality so that we can engage in the digital world as in the physical world and to Walsh (2023), it's a vision for a network of digital worlds through which we will navigate seamlessly using virtual reality (VR) and augmented reality (AR) devices to connect with others. The implication is that Virtual reality (VR) and augmented reality (AR) are two technologies considered particularly important to the development and growth of the metaverse as VR is a simulated 3D environment that enables users to interact with a virtual surrounding in a way that approximates reality as perceived through our senses. This approximation of reality is now typically accessed through a VR headset that takes over a user's field of vision. Haptic, including gloves, vests and even full-body tracking suits, enable more lifelike interaction with the virtual environment and AR is less immersive than VR. It adds digital overlays on top of the real world using digital rendering tools. Users can still interact with their real-world environment. The game Pokémon Go is an early example of AR. Google Glass and head-up displays in car windshields are well-known consumer AR products. As averred by Tucci and Moore (2024) Visions of a parallel digital universe where humans can experience life in ways both akin to and not possible in the real world aren't new as they predate the internet. The only thing that is novel is the concept of a blended physical and digital reality which became more tangible in recent decades as technological advances from the near-universal adoption of mobile phones and rollout of high-speed internet to popular games such as Pokémon Go made the metaverse seem less far-fetched.

With Virtual Reality (VR) technology becoming more prominent, there is this hike that there is need for the application of metaverse in libraries if one considers its benefits to both libraries and librarians. Despite the recent popularity in the virtual landscape and the associated prospects for libraries, there are notable challenges for libraries if it is to be effectively utilized in libraries that call for librarians and library users acquiring the desirable new skills and metaverse proficiency. One thing that calls to mind in this situation is for librarians and users to incorporate meta-literacy which explains

the needed skills for individuals to excel in the present global digital ecosystem as the skills are embodiment of digital literacy, critical thinking, ethical information usage as well as full understanding of global information dimension. It is against this backdrop that Ajani et al (2023) emphasized the need for librarians and library users to explore the dynamics of metaverse and its capability to replete with large amount of information storage as meta-literacy skill is what librarians and users cannot do without in the present digital age.

There are also research based evidences in recent time unfolding the prospects of metaverse in libraries among them are Lam (2020) who addressed complexities of embedding VR technology into library education and training initiatives, Jin and He (2021) who explored how the metaverse might augment information retrieval and access as well as Pu et al. (2021) looked into the potential of virtual reality (VR) technology in enriching library programmes and services and concluded that VR technology holds the capability to elevate various aspects of library engagement, including virtual reference services, immersive tours of library spaces, and the creation of virtual learning environments. Regardless of these notable prospects metaverse technology has for libraries, it is pertinent to state that the technology also came with its own hydra-headed challenges such as safeguarding user privacy among others which librarians must also battle with if the gains of the technology are to be harnessed to the fullest. It is in view of the above there arise, the need for meta-literacy for librarians and library users and since of VR technology has great potentials to restructure library services and programs there is also the need for new windows for hanging user interactions. In all, librarians have always been at the forefront of providing access to information and going by the highlighted benefits, do one assumes that the metaverse opens up new avenues for expanding this accessibility. If this assertion should hold in libraries of developed nation can this be said to be same in developing nations like Nigeria and are librarian and users alike equipped in skills to manage and utilize this technology It is in view of this and as result of existing knowledge gap of the subject area that this study has become imperative with area of concentration being Nigeria and while librarians form the population of study.

Research Objectives

The principle objectives of this study are to:

1. Ascertain the benefits of adopting metaverse in libraries
2. Determine the need for fostering meta-literacy among librarians and users and
3. Identify challenges that will militate against utilization of metaverse in libraries

Literature Review

The Metaverse is a virtual reality (VR) and augmented reality (AR)-driven universe where people can interact with each other and the environment in digital spaces. It's an immersive, interconnected network of virtual worlds, where users can work, socialize, play games, shop, create, and even conduct business. The term "Metaverse" was coined by author Neal Stephenson in his 1992 sci-fi novel *Snow Crash*, where it was used to describe a virtual reality space inhabited by avatars of real people. In recent years, the Metaverse has evolved from a futuristic concept into a developing digital ecosystem driven by advancements in technology like VR, AR, blockchain, AI, and 3D simulation. This shift is being accelerated by major tech companies, including Meta (formerly Facebook), Microsoft, Google, and others, all vying to shape the future of the Metaverse.

Conceptual of meta-verse

Going down the memory lane, the recent hype around the metaverse could be traced back to the 20th century to be precise in 1992 when the name metaverse was introduced by Neal Stephenson into the lexicon, albeit in a fictional setting in his dystopian sci-fi novel Snow Crash describing a virtualized environment where people gained status based in part on the technical skill of their avatars. In addition to popularizing the concept of digital avatars, the novel's depiction of a networked 3D world is said to have influenced real-life web programs, including Google Earth and NASA World Wind (Tech Target, 2023). Another novel that made metaverse famous was Ernest Cline's Ready Player One, published in 2011 and later made into a movie by Steven Spielberg. It depicted a future where people escape real-world problems by entering the Oasis; a virtual world accessed using a VR headset and haptic gloves that provide tactile sensations. Such haptic feedback also became a key metaverse building block. Apart from fiction, the foundational technologies supporting an actual metaverse date

back to the 1960s. The metaverse's legacy includes two other hype waves that are all but forgotten, the first one in the early 2000s when use of the pioneering Second Life virtual community plateaued after initial growth, and the second in 2010 when the first VR headsets proved not to be the gateway to the metaverse that inventors anticipated. Both busts led to significant technological advances, though. (Tech Target (2024)

To this end, the metaverse is seen as a groundbreaking advancement in digital technology and experiences and has the prowess to virtually, interconnect the universe where individuals can seamlessly work, play and socialize. In this expansive domain explains Accenture (2023) the physical and digital realms overlap, enabling people, avatars and digital personas to engage in a wide range of activities. Powered by Web3 and built on artificial intelligence (AI) and emerging 3D visual technologies, the metaverse's unique blend of the physical and digital realms is known as the Internet of Place. Using technologies like augmented reality (AR) and virtual reality (VR), the metaverse also seamlessly generates digital replicas of real spaces called digital twins, which can be used to simulate scenarios and optimizations before implementing them in the real world (Accenture, 2023)

While Gartner (2023) describes metaverse technologies in terms of "tech themes," which include spatial computing, digital humans, shared experiences, gaming and tokenized assets. Forrester Research characterizes metaverse tools as "enablers of 3D development environments with the importance lying in its potential to redefine the way we live, work and connect while fostering unprecedented levels of collaboration and connectivity by breaking down geographical barriers. The metaverse is also defined as the convergence of physical and virtual space accessed through computers and enabled by immersive technologies such as virtual reality, augmented reality and mixed reality. Described by proponents as the next iteration of the internet, this 3D virtual world is envisioned as a persistent, collective, shared space where digital facsimiles of ourselves, or avatars, move freely from one experience to another, taking our identities and monetary assets with us. (Tucci & Moore, 2024). It is also defined as a virtual space where people can interact with each other and the digital world in a variety of ways, including work, play, and socializing. It's a network of digital worlds that can be accessed through virtual reality (VR) and augmented reality (AR) devices. In all, the metaverse is powered by artificial intelligence (AI), Web3, and 3D visual technologies. It's built on the idea of the Internet of Place, which is where the physical and digital realms overlap. The metaverse could have a significant impact on how people interact with each other, technology, and the world around them. (Google Cloud, 2024).

Meta-literacy

Meta-literacy will be better understood if discussed from the perspective of Digital Literacy. According to American Library Associations (ALA) (2017), digital literacy was initially focused on digital skills and stand-alone computers but with the emergent of the internet and social media its use has shifted some of its focus to mobile devices and to other evolving definitions of literacy that recognize the cultural and historical ways of making meaning (The New London Group, 1997),though, digital literacy does not replace traditional methods of interpreting information but rather extends the foundational skills of these traditional literacies (Jenkins, 2009). Invariably, digital literacy should be considered a part of the path towards acquiring knowledge. Digital literacy is seen further according to ALA (2017) as an individual's ability to find, evaluate, and communicate information using typing or digital media platforms. It is a combination of both technical and cognitive abilities in using information and communication technologies to create, evaluate, and share information. While UNESCO (2018) defined it as the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship.

The whole idea is embedded under competences that are variously referred to as computer literacy, Information Communication Technology literacy, information literacy and media literacy. As noted by International Telecommunications Union (2010), digital literacy consists of equipping people with ICT concepts, methods and skills to enable them to use and exploit ICTs. The related concept of information literacy consists of providing people with concepts and training in order to process data and transform them into information, knowledge and decisions. It includes methods to search and evaluate information, elements of information culture and its ethical aspects, as well as methodological and ethical aspects for communication in the digital world. Digital literacy has been further explained as the ability to navigate, assess, and use digital

information and communication technologies successfully which are all included in the concept of digital literacy and involves a collection of socio-emotional, technological, and cognitive abilities that enable people to actively engage and interact seamlessly in the digital environment. Beyond technological competence, digital literacy includes media literacy, information fluency, and critical thinking in a digital environment without be stuck (UK, The Royal Society, 2012).

On the other hand, meta-literacy as it concerns the librarians should be within the context of the metaverse, which is a domain encompassing the utilization and generation of information in the digital era. Beyond conventional literacy abilities, meta-literacy encompasses critical thinking, ethical information utilization and collaborative content creation. Particularly within the metaverse, meta-literacy stands as a pivotal asset for librarians, equipping them with knowledge on how to adeptly navigate and produce digital material that can boast accessibility, reliability and pertinence for information

Theoretical and Empirical Framework

Metaverse per-se is a holistic term used to define an artificially designed virtual environment that is formed as a result of the marriage between virtual and physical realities. It functions as a dynamic digital ecosystem, harnessing state-of-the-art technologies that converge in a digital realm that mirrors the physical world, and can be navigated using avatars. Fundamental to this digital realm is Web3 technology, a decentralized foundation that guarantees secure controls over digital identities and assets. Ultimately, metaverse enhances connectivity as it allows for an unprecedented global connectivity, bridging distances for collaboration, innovation and social interaction, immersive experiences as a canvas for boundless creativity that caters to diverse human needs and desires, brings about economic opportunities as Industries from entertainment to education will be reshaped and entrepreneurial ventures empowered and continuous evolution on the ground that this an ongoing journey of technological advancement that demands a culture of adaptation and learning. The importance of this technology lies in its potential to redefine the way we live, work and connect. It fosters unprecedented levels of collaboration and connectivity by breaking down geographical barriers. And businesses can tap into a global talent pool and remote socialization, which can spur economic and personal growth.

Writing on areas the metaverse can be used in libraries in the provision of services and experiences, Google cloud (2024) hinted that it could be used for virtual services in that Libraries and can offer virtual reference services, virtual tours, virtual exhibitions, and virtual learning spaces, in events where Libraries can host Library and Information Science conferences and other events in the metaverse, in education and training through which Libraries can provide LIS education and training in the metaverse, provision of services for people with disabilities as this can be easily done in the metaverse. The metaverse can also create immersive and interactive learning environments that can help students learn more efficiently as well. Metaverse can provide access to resources and consultation services and interaction with other users as users can interact with other users and staff in the metaverse. This implies that the metaverse is a virtual shared space where users can interact with each other and with virtual objects.

There are also research based evidences in recent time unfolding the prospects of metaverse in libraries among them are Lam (2020) who addressed complexities of embedding VR technology into library education and training initiatives, Jin and He (2021) who explored how the metaverse might augment information retrieval and access as well as Pu et al. (2021) looked into the potential of virtual reality (VR) technology in enriching library programmes and services and concluded that VR technology holds the capability to elevate various aspects of library engagement, including virtual reference services, immersive tours of library spaces, and the creation of virtual learning environments. On what metaverse mean for the average user, Tucci and Moore (2024) reveal that on the positive side, an immersive metaverse enables humans to go where they were never able to go before, including outer space and that with metaverse, online social connections can also become much richer while on the other hand, the bad behavior witnessed on social platforms has the potential to be magnified in a virtual world, and metaverse usage could be addictive to some people..

Furtherance, within the libraries operations space, the use of metaverse has created new window for engaging with library users which on the other hand, enhances access to information. In this vein noted Pu et al. (2021) the application of virtual

reality (vr) technology has created that enabling virtual learning environment, enough space to tour the library environment as well as the provision of virtual reference aid. The emphasis is that by capitalizing on these services enabled by the application of vr, library users experience are likely to be enriched and with this libraries and their services are made more accessible. Suffice to say, that libraries are best framed to leverage on the gains of metaverse with a view to enhancing information services to users and access to information and that VR has what it takes to enhance library series as they concern, virtual reference aid, all round library tour, favorable and conducive learning environment. Metaverse is also seen as a viable tool for information retrieval and accessibility as it is asserted to, VR has the potential to make-up library client experience (Jin and He, 2021). In his contribution, Kinkade (2022) emphasized on the importance of transparent data collection and utilization policies, accentuating the user experience and exploiting VR technology to amplify information accessibility, while Gallagher et al. (2020) noted that metaverse also enriches virtual reference services, enabling users to interact with librarians within a 3D setting, fostering tailored support. This experience added Frye et al., (2021), 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.

In all, one notable benefits of integrating the metaverse into libraries as revealed by Ajani et al. (2023) is it potential to significantly enhance user engagement in that traditional libraries known from time immemorial to be synonymous with quietness, solitary spacious, little or no interaction and collaboration between users. To this end, the metaverse, with its immersive and interactive nature, provides an opportunity to redefine the library experience. With metaverse library users can get involved in virtual meetings, attend lectures and also participate in collaborative projects within the digital realm of the metaverse. Furthermore, the metaverse allows libraries to host virtual events and exhibitions, reaching a global audience without the constraints of physical space. This increased accessibility promotes inclusivity and allows individuals from diverse backgrounds to participate in library activities, fostering a more connected and dynamic community. This benefit in particular favors persons who as a result of distance or geographical location may find it difficult to have physical access to a traditional library. In addition, the metaverse enables libraries to create dynamic and interactive exhibits, transforming static information into immersive experiences and library patrons can explore historical archives, virtually visit distant libraries, and engage with digital collections in ways that go beyond the limitations of physical space. The underlying factor is that the metaverse presents libraries with an opportunity to create immersive learning environments that cater to diverse learning styles. This is built on the fact that virtual classrooms and interactive simulations can enhance educational experiences, providing a more engaging and effective way for users to acquire knowledge (Tella et al., 2023) and under this type of environments, users can participate in virtual discussions, conduct experiments, and explore educational content in ways that transcend the traditional boundaries of a physical library.

As regards to meta-literacy for Librarians and Users, the growth of Virtual Reality (VR) technology did heighten the potential applications of the metaverse and its noted benefits to libraries and their librarians. As the metaverse, continues to expand its landscape, there came to lime-light its numerous prospects and bottlenecks for libraries, which requires that for librarians and library users to remain relevant, need to acquire the desired new skills and be more proficient in tandem with the trending technology. In this regard the prime consideration in metaverse landscape is the inclusion of meta-literacy which will allow librarians and library users to acquire skills and proficiencies that are very necessary and important for anyone to thrive in today's digital ecosystem. It is on this ground that Ajani et al. (2023) opine that librarians and library users need to navigate the dynamism of metaverse and its ability to replete with copious information stores, meta-literacy stands as an indispensable skill.

Considering the benefits of metaverse to libraries the need for fostering meta-literacy skills among librarians and library users in this era of metaverse technology becomes imperative as conventional literacy competencies have proved inadequate to navigate the intricate and ever-evolving digital terrain as meta-literacy is an embodiment of many proficiencies, which include, critical thinking, ethical information use and collaborative content creation of which are of paramount importance to both librarians and library users in this present global digital ecosystem. As stated by Mackey and Jacobson (2018); Hodges

and Blythe (2022) it is imperative for digital librarians to forge partnerships with educators and information specialists as to fostering critical thinking, collaboration and ingenuity through immersive and interactive learning experiences within virtual learning settings. Above all, in this present dispensation, library users need to acquire meta-literacy proficiencies if they are to adequately maneuver through and access resources in the VR era.

Meta-literacy skills also stand as key agents for facilitating the effective and efficient utilization of the metaverse within library services. These skills therefore hold paramount importance for library users, as they form the bedrock for proficiently accessing and leveraging digital resources. Besides, meta-literacy skills are equally indispensable for the creation and dissemination of digital content, productive collaboration, and meaningful participation in online communities. The above assertion is further buttressed by Behling and Critten (2021) and Lee and Paik (2021) in their different studies on the transformative influence of meta-literacy-based information literacy initiatives on undergraduate students emphasized the indispensable nature of cultivating these skills within the library users.

However, there are some challenges to using the metaverse in libraries, including limited access and availability of resources, Information overload, Technical skills, Ethical considerations, and Digital divide. On the challenges noted Tech Target (2023), no matter what form the metaverse takes, cyber security challenges and privacy challenges loom as major concerns and that the current lack of privacy regulations for the metaverse presents many risks for businesses and users, including the misapplication of current privacy regulations, such as GDPR, intrusive and extensive data collection, issues concerning data rights and ownership, exploitation of minors and User-to-user privacy. One other most serious ethical issue related to the use of VR and other extended reality technologies highlights Tech Target (2023) centers on the exposure of individual mental models. The concern is that VR software can tap into the subconscious thought processes of a person by monitoring eye movements and other involuntary reactions, revealing inner thoughts that can influence decisions. This insight enables the software to make highly accurate predictions about human decision-making, raising concerns about potential misuse by companies. Ethicists point out that mental model could also be used as public training data.

According to Tella et al. (2023) Virtual Reality (VR) and Augmented Reality (AR) technologies require significant computing power and network capabilities. The challenge is that many libraries, especially those facing inadequate funding, may struggle to invest in the necessary hardware and software to support a seamless metaverse experience for their users and above all, ensuring compatibility and interoperability between various metaverse platforms poses a technical challenge. While the metaverse holds the promise of expanding access to information, Ajani et al. (2023) argue that implementing metaverse raises concerns about digital inclusion and accessibility as not all individuals have access to the required devices or reliable internet connections to participate fully in a virtual library experience. The authors further argue that this digital divide may disproportionately affect marginalized communities, exacerbating existing inequalities in access to educational and informational resources. Libraries must address these accessibility challenges by considering alternative means of providing metaverse experiences, such as offering hybrid services that combine virtual and physical components. Within this context, Tella et al. (2023) underscore the fact that while the metaverse offers a platform for pioneering library services, disparities in access to requisite technology and equipment can curtail some users' full engagement in the virtual sphere. In concurrence, Behling and Critten (2021) draw attention to the potential inundation of information within the metaverse, which may overwhelm digital librarians and users alike.

Methodology

The study adopted descriptive survey research design with the aim of collecting data on and describing in a systematic manner the characteristics features and facts about a given population. This type of study is only interested in describing certain variables like dependent and independent variables in relation to the population. The sampled population for this study was 850 selected through purposive sampling technique among 7850 registered librarians in Nigeria from different types of libraries in Nigeria with the exception of the school librarians since no primary or secondary school in Nigeria can boast of a certified librarians. The sampled librarians were

identified and selected with the help of Librarians' Registration Council of Nigeria list of certified librarians in Nigeria as at 2023. The breakdown shows that academic libraries form 548 of the respondents; public libraries -222, special libraries -40 and national library-30 respondents. The primary instrument used in this study for data collection is the questionnaire. Apart from section 'A' of the instrument which dealt with demographic data the other aspect of the instrument was structured according to the modified Likert scale on four point rating scale. On this scale, the average mean cut off is 2.50, in which case, an item is accepted if it is 2.50 and above and rejected if it is below 2.50 hence the decision rule. The questionnaires were administered through email and returned 93%. The implication is that a total of 850 questionnaires were administered and only 820 were returned. Data collected were statistically analyzed using frequencies, percentile and mean (X) and presented in tables.

Presentation of Data and Results

Table 1: Benefits of adopting metaverse in libraries

Items	SA		A		DA		SDA		Mean (X)
	F	%	F	%	F	%	F	%	
Integrating the metaverse into libraries has the potential for significantly enhancing user engagement	320	39.02	270	32.93	76	9.27	154	18.78	2.92
With its immersive and interactive nature, metaverse provides an opportunity to redefine the library experience	540	65.85	280	34.15	***	***	***	***	3.66
Users can engage in virtual meetings, attend lectures, and participate in collaborative projects within the digital realm of the metaverse	610	74.39	120	14.63	66	8.05	24	2.93	3.60
Metaverse can allow libraries to host virtual events and exhibitions, reaching a global audience without the constraints of physical space.	820	100	***	***	***	***	***	***	4.00
Metaverse will increase accessibility promotes inclusivity and allows individuals from diverse backgrounds to participate in library activities, fostering a more connected and dynamic community.	820	100	***	***	***	***	***	***	4.00
The metaverse presents libraries with an opportunity to create immersive learning environments that cater to diverse learning styles	770	81.71	40	4.88	***	***	10	1.22	3.91
The metaverse will enable libraries to curate dynamic and interactive exhibits, transforming static information into immersive experiences.	670	81.71	30	3.66	81	9.88	39	4.76	3.62
Through virtual libraries, users can access a vast array of digital resources, including books, articles, and multimedia content, from anywhere in the world	820	100	***	***	***	***	***	***	4.00
Users can explore historical archives, virtually visit distant libraries, and engage with digital collections in ways that go beyond the limitations of physical space	440	53,66	320	39.02	33	4.02	27	3.29	3.43
In these environments, users can participate in virtual discussions, conduct experiments, and explore educational content in ways that transcend the traditional boundaries of a physical library.	820	100	***	***	***	***	***	***	4.00
Libraries in the metaverse can offer personalized learning experiences, adapting content to individual preferences and learning objectives which can lead to a more efficient and enjoyable learning process, ultimately promoting a culture of continuous learning within the community.	700	85.37	120	14.63	***	***	***	***	3.85

Table 2: Need for Fostering meta-literacy skills among librarians and library users

Items	SA		A		DA		SDA		Mean (X)
	F	%	F	%	F	%	F	%	
Conventional literacy competencies are inadequate to navigate the intricate and ever-evolving digital terrain	820	100	***	***	***	***	***	***	4.00
Meta-literacy encapsulates a spectrum of proficiencies, encompassing critical thinking, ethical information use and collaborative content creation	770	93.90	50	6.10	***	***	***	***	3.94
It will help librarians to forge partnerships with educators and information specialists,	450	54.88	220	26.83	110	13.41	40	4.88	3.32
To fostering critical thinking, collaboration and ingenuity through immersive and interactive learning experiences within virtual learning settings	370	45.12	259	31.59	70	8.54	121	14.76	3.07
Meta-literacy proficiencies will aid library users to adeptly maneuver through and access resources in the Virtual Reality (VR) era.	820	100	***	***	***	***	***	***	4.00
It will help users acquire the ability to appraise resource quality, ensure credibility, and engage ethically.	820	100	***	***	***	***	***	***	4.00
Meta-literacy skills stand as pivotal agents for fostering the effective utilization of the metaverse within library services.	820	100	***	***	***	***	***	***	4.00
Meta-literacy skills are equally indispensable for the creation and dissemination of digital content, productive collaboration, and meaningful participation in online communities	685	83.54	135	16.46	***	***	***	***	3.84

Table 3: Challenges

Items	SA		A		DA		SDA		Mean (X)
	F	%	F	%	F	%	F	%	
Lack of robust technological infrastructure	820	100	***	***	***	***	***	***	4.00
Lack of significant computing power and network capabilities skill to manage VR and AR technologies	430	52.44	128	15.61	190	23.17	131	15.98	3.19
Inadequate funding, that libraries cannot afford the needed hardware and software	213	25.98	82	10	340	41.46	185	22.56	2.89
May lead to denial of digital inclusion and accessibility	420	51.22	270	32.93	50	6.10	80	9.77	3.26
Unreliable internet connectivity to participate fully in a virtual library experience	820	100	***	***	***	***	***	***	4.00
Copyright and intellectual property issues become more complex in the digital realm	820	100	***	***	***	***	***	***	4.00
Metaverse raises significant privacy and ethical concerns related to user data and virtual interactions	820	100	***	***	***	***	***	***	4.00
Access to requisite technology and equipment can curtail some users' full engagement in the virtual sphere	820	100	***	***	***	***	***	***	4.00

Going by the data collected and displayed in table 1 above indicate that the librarians are pretty abreast with the benefits of metaverse in libraries as the 820 respondents representing 100% strongly agree that with metaverse technology adopted in libraries, it can allow libraries to host virtual events and exhibitions, reaching a global audience without the constraints of physical space, increase accessibility promotes inclusivity and allows individuals from diverse backgrounds to participate in library activities, fostering a more connected and dynamic community, users can access a vast array of digital resources, including books, articles, and multimedia content, from anywhere in the world and users can participate in virtual discussions, conduct experiments, and explore educational content in ways that transcend the traditional boundaries of a physical library. Another 100% strongly agree or agree that the immersive and interactive nature of metaverse provides an opportunity to redefine the library experience and with it, libraries can offer personalized learning experiences, adapting content to individual preferences and learning objectives which can lead to a more efficient and enjoyable learning process, ultimately promoting a culture of continuous learning within the community.

As shown in table 2 the 820 respondents or 100% strongly agree that there is need for meta-literacy for both librarians and library users as conventional literacy competencies are inadequate to navigate the intricate and ever-evolving digital terrain, Meta-literacy proficiencies will aid library users to adeptly maneuver through and access resources in the Virtual Reality (VR) era, It will help users acquire the ability to appraise resource quality, ensure credibility, and engage ethically and that Meta-literacy skills stand as pivotal agents for fostering the effective utilization of the metaverse within library services. Whereas, 685 or 83.54% of the respondents strongly agree and the 135 or 16.46% agree that Meta-literacy skills are equally indispensable for the creation and dissemination of digital content, productive collaboration, and meaningful participation in online communities, the same 100% strongly agree and agree in the proportion of 770 and 50 respectively that Meta-literacy encapsulates a spectrum of proficiencies, encompassing critical thinking, ethical information use and collaborative content creation.

The data in table 3 reveal that the 820 respondents or 100% strongly agree that Lack of robust technological infrastructure, Unreliable internet connectivity to participate fully in a virtual library experience, Copyright and intellectual property issues become more complex in the digital realm and that Metaverse raises significant privacy and ethical concerns related to user data and virtual interactions as well as access to requisite technology and equipment can curtail some users' full engagement in the virtual sphere. 430 or 52.44% strongly agree and 128 which stand for 15.61% agree that lack of significant computing power and network capabilities skill to manage VR and AR technologies is another challenge. On the other hand, 525 of the respondents representing 64.02% did not agree that inadequate funding as result libraries cannot afford the required hardware and software is a challenge. This implies that the respondents do not believe that libraries in Nigeria are all that underfunded rather the issue, is that of misappropriation of fund by library management.

Discussion of Findings

The outcome of this study did reveal that librarians in Nigeria in the first instance are pretty conversant with metaverse technology as they did agree that the adoption of metaverse in library operations will among other things, allow libraries to host virtual events and exhibitions, reaching a global audience without the constraints of physical space, increase accessibility promotes inclusivity and allows individuals from diverse backgrounds to participate in library activities, fostering a more connected and dynamic community, users can access a vast array of digital resources, including books, articles, and multimedia content, from anywhere in the world and users can participate in virtual discussions, conduct experiments, and explore educational content in ways that transcend the traditional boundaries of a physical library as well as that the metaverse presents libraries with an opportunity to create immersive learning environments that cater to diverse learning styles. This result is not far from the view expressed in Google cloud (2024) where it was hinted that metaverse could be used for virtual services in that Libraries can offer virtual reference services, virtual tours, virtual exhibitions and virtual learning spaces, in events where Libraries can host Library and Information Science conferences and other events in the metaverse, in education and training through which Libraries can provide LIS education and training in the metaverse and provision of services for people with disabilities..

The study further discovered that librarians realized the need for meta-literacy for themselves and the library users (see table 2). According to the finding, they strongly agree that meta-literacy is necessary as conventional literacy competencies are inadequate to navigate the intricate and ever-evolving digital terrain and that meta-literacy proficiencies will aid library users to adeptly maneuver through and access resources in the Virtual Reality (VR) era. Besides, It will help users acquire the ability to appraise resource quality, ensure credibility, and engage ethically and that meta-literacy skills stand as pivotal agents for fostering the effective utilization of the metaverse within library services as well as that meta-literacy encapsulates a spectrum of proficiencies, encompassing critical thinking, ethical information use and collaborative content creation. The outcome of this study further collaborate the position of Mackey and Jacobson (2018); Hodges and Blythe (2022) who assert that it is imperative for digital librarians to forge partnerships with educators and information specialists as to fostering critical thinking, collaboration and ingenuity through immersive and interactive learning experiences within virtual learning settings and in this present dispensation, library users need to acquire meta-literacy proficiencies if they are to adequately maneuver through and access resources in the VR era. The above assertion is further buttressed by Behling and Critten (2021) and Lee and Paik (2021) in their different studies on the transformative influence of meta-literacy-based information literacy initiatives on undergraduate students emphasized the indispensable nature of cultivating these skills within the library users

The study also identified some of the challenges that may militate against the adoption and utilization of metaverse in libraries in Nigeria and by extension making the acquisition of meta-literacy proficiencies as bridge too far. Among the challenges identified are, lack of robust technological infrastructure, unreliable internet connectivity to participate fully in a virtual library experience and above all the copyright and intellectual property issues that have become more complex in the digital realm and that metaverse raises significant privacy and ethical concerns related to user data and virtual interactions as well as access to requisite technology and equipment that can curtail some users' full engagement in the virtual sphere among others. This discovering is in tandem with the assertion of Tella et al. (2023) that Virtual Reality (VR) and Augmented Reality (AR) technologies require significant computing power and network capabilities and Tech Target (2023) that declares that no matter what form the metaverse takes, cyber security challenges and privacy challenges loom as major concerns and that the current lack of privacy regulations for the metaverse presents many risks for businesses and users, including the misapplication of current privacy regulations, such as GDPR, intrusive and extensive data collection, issues concerning data rights and ownership, exploitation of minors and User-to-user privacy.

Conclusion and recommendations

From the outcome of this study, it is emphatic that there are many benefits associated with metaverse and which are at the beck and coin of Libraries considering the fact, that metaverse do create communal digital space and serves as the core centre of information. Of course not everyone will desire, or be able to, take advantage of the metaverse and concerns have been raised that this will further widen a digital divide that was exacerbated in the COVID-19 pandemic by inequitable access to the internet. On the other hand, the optimal utilization of the metaverse technology in libraries of any sort depends on the meta-literacy skills acquired or possessed by both the librarians and library users. This is because without such skills, both librarians and library users cannot navigate and understand what happens within the digital ecosystem. Furtherance, the possession of eta-literacy skills equips both librarians with critical thinking, digital citizenship, and ethical information utilization abilities which are necessary to transverse the metaverse space. It is against this backdrop that librarians felt that there is every need for librarians and library users to possess meta-literacy skills or proficiencies if they are to type fully into the gains of metaverse.

As identified, it may not be so easy to acquire considering the numerous challenges identified (table 3). Be that as it may, librarians and library users have no option than to adapt to the trend and have themselves regularly trained in line with unending technological changes and the metaverse's ongoing evolution if they are to remain relevant and capable enough to deliver on regular basis the dividends of contemporary information and communication technologies to their teeming clients. The implication is that regular trainings and back-

ups from library management can assist both the digital librarians and library users in being up-to-date with technological advancement and for the librarians; they will be competent in providing all the desirable and needed resources and services to their library users. Besides, by acquiring meta-literacy proficiencies, both librarians and users will have the withal to navigate and interact with digital information within the metaverse space thereby tapping to the fullest its accrued potentials. Inasmuch as they are identified challenges that may hinder the adoptions of metaverse in libraries in a country like Nigeria, it is imperative for librarians not to wait for such technologies to be introduced in their libraries before they think of acquiring the necessary skills if they really want to continue to be relevant in ever dynamic digital ecosystem, they should rather be prepared and not to be found wanting in a case of a sudden demand for technological driven librarians. Based on the findings of this study, the following suggestions are proffered to facilitate the acquisition of meta-literacy skills for librarians and library user in metaverse world:

In line with the changing world as has been emphasized; it behooves libraries and their management to make it a point of duty and a necessity to update the knowledge of their librarians on regular basis through training and re-training according to technological trends. In the context of metaverse, the digital librarian should be continually exposed to training on the latest on meta-literacy skills and the digital librarians should in-turn train the library users on the skills of utilizing metaverse in information services. These trainings may come in the form of workshops, webinars, conventional institutions and online courses.

1. Libraries should not sit on the fence rather they need to understand how the metaverse can compliment conventional library services, starting from information literacy to research support and community outreach. As has been noted, metaverse's has the potential as a collaborative space for learning and research which allows users to have access to virtual collections and exhibits.
2. Libraries as the home of knowledge and librarians the driving access to information play prominent role in enhancing critical thinking and training and bringing up users who are digitally sound as it concerns utilizing digital information and resources. To this end, libraries and librarians should be at the fore-front of championing use of ethical information and making them to understand the need to ritually assess information obtain digitally as digital citizens.
3. Libraries should prioritize the cultivation of meta-literacy skills encompassing critical thinking, information assessment, and technical proficiencies. Librarians, in particular, can assume a pivotal role in guiding users through the metaverse, offering training and assistance in honing these essential proficiencies.
4. Libraries should partner entities within the metaverse, such as virtual museums and galleries through the array of information and resources accessible to their users can be enriched and this will eventually enhance the experience of the user.

One of the strategies for libraries to captivate users and amplify their meta-literacy capabilities is the crafting of immersive learning experiences. The arsenal of approaches encompasses immersive VR encounters and interactive learning modules, both of which contribute to an enriched learning journey. Most of the issues discovered as challenges, the rightful appropriation of funds covers these sins. The suggestion here is that fund appropriated for library management should be rightly appropriated to those resources' and materials that will facilitate effective and efficient service delivery such as robust technological infrastructure, internet connectivity that will allow full participation in a virtual library experience and sponsoring digital librarians to acquire significant computing powers and network capabilities skills to manage VR and AR technologies. Funds should be channeled towards the adoption of contemporary technology such as metaverse as by so doing, it will foster the training of librarians to possessing meta-literacy skills which will in turn lead to the training of library users in the area

References

Accenture (2024). Why is the metaverse important? Available at https://www.accenture.com/us-en/insights/metaverse

Ajani, Y. A., Enakrire, R. T., Oladokun, B. D. & Bashorun, M. T. (2023). Reincarnation of

libraries via metaverse: A pathway for a sustainable knowledge system in the digital age. Business Information Review. https://doi.org/10.1177/02663821231208044

American Library Associations (2017, Jan 19). Digital Literacy: Welcome to ALA's literacy clearinghouse. Available at https://literacy.ala.org/digital-literacy/

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

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.

Gartner (2023). Metaverse. Available at https://www.gartner.com/gatner-glossary/information-technology-glossary/M/metaverse

Google cloud (2023). What is metaverse? Available at https://www.google.com/search?client=firefox-b-e&q=what+is+metaverse

Google cloud (2024). Uses of metaverse in the library. https://www.google.com/search?client=firefox-b-e&q=uses+of+metaverse+in+the+library

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

International Telecommunication Union (2010), World Telecommunication/ICT Development Report 2010: Monitoring the WSIS Targets Retrieved from https://unevoc.unesco.org/home/TVETipedia+Glossary/show=term/term=Digital+literacy

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

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

Kristensson, P.O (2022). Working in the metaverse.**https://www.weforum.org/agenda/2023/01/davos-immersive-eperiences-close-digital-divide/**

Lee, J. Y., & Paik, W. (2021). Developing undergraduate students' metaliteracy skills through information literacy programs: an exploratory study. *College & Research Libraries,* 82*(*3): 362-377.

Lubetsky, L. (2022). Three possible scenarios for the metaverse that still hold true. 2022 MIT Platform Strategy Summit Available at https://ide.mit.edu

Mackey, T. P., & Jacobson, T. E. (2018). Meta-literacy: Reinventing Information Literacy to Empower Learners. American Library Association.

Pu, X., Li, L., & Chai, X. (2021). Virtual reality technology in library services: A literature review. Information Technology and Libraries, 40(1): 88-102, doi: 10.6017/ital.v40i1.12552.

Tech Target (2023a). Metaverse privacy concerns and how to address them. Available **https://www.techtarget.com/searchcio/tip/Metaverse-privacy-concerns-and-how-to-address-them/**

Tech Target (2023b). 4-major virtual reality ethics-issues that needs to be addressed **https://www.techtarget.com/searchcio/tip/4-major-virtual-reality-ethics-issues-that-needs-to-be-addressed/**

Tech Target (2024). History of the-metaverse explained. Available at **https://www.techtarget.com/searchcio/tip/History-of-the-metaverse-explained**

Tella, A., Ajani, Y. A., Ailaku, V. U. (2023). Libraries in the metaverse: the need for meta-literacy for digital librarians and digital age library users Libraries. *Library Hi Tech News,* 41(3): 82-91, doi: 10.6017/ital.v41i3.12656.

Tucci and Moore (2024). What is the metaverse An explanation and in-depth guide. Available at **https://www.techtarget.com/contributor/Linda-Tucci/John-Moore/**

UK, The Royal Society (2012), Shut down or restart? The way forward for computing in UK schools. https://unevoc.unesco.org/home/TVETipedia+Glossary/show=term/term=Digital+literacy

UNESCO Institute for Statistics (2018). A global framework of reference on digital literacy skills for Indicator 4.4.2. Available at https://unevoc.unesco.org/home/TVETipedia+Glossary/show=term/term=Digital+literacy

University of Cambridge (2023). What is the metaverse and will it help us or harm us? Chatham House: University of Cambridge Press

Walsh, L (2023). What is Metaverse? Available at https://www.cam.ac.uk/stories/metaverse