LIBRARIANS' PERCEPTION ON THE USE OF VIRTUAL REALITY IN SELECTED ACADEMIC LIBRARIES IN KWARA STATE

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE, INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY, KWARA STATE POLYTECHNIC, ILORIN

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CERTIFICATION

This is to certify that this project titled **"*Librarians' Perception on the Use of Virtual Reality in Selected Academic Libraries in Kwara State*"** has been read and approved as meeting the requirements of the Department of Library and Information Science, Kwara State Polytechnic, Ilorin, for the Award of National Diploma in Library and Information Science.

A. O. Isiaka (Supervisor)	Date
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DEDICATION

This research is dedicated to Almighty God.

DECLARATION

I, TOYIN, Mariam Ajoke, a ND student in the Department of Library and Information Science, Kwara State Polytechnic, Ilorin, hereby declare that this research project titled *"Librarians' Perception on the Use of Virtual Reality in Selected Academic Libraries in Kwara State"*, submitted by me is based on my actual and original work. Any materials obtained from other sources or work done by any other persons or institutions have been duly acknowledged.

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Date

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TABLE OF CONTENTS

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

Abstract

Virtual Reality (VR) is a universal technological sensation that has had a significant impact on professionals in a wide range of professions, including medicine, engineering, aviation, military, and, more lately, librarianship. These devices fully simulate the interaction with the virtual environment by influencing all five human senses compared to conventional computer systems. It is a rich visualization and analytical platform that contributes to the library's mission of providing access to all forms of information and supporting pedagogy and science across disciplines. Libraries are increasingly using virtual reality technology for research and instructional purposes. It is on these premises that this study investigated the librarians' perception on the use of virtual reality technology in selected academic libraries in Kwara State. A descriptive survey design was adopted, and questionnaire was used to collect data. The sampling techniques adopted by this study is simple random as only the library staff were useful for the study which constituted the sampling frame. for this study, and total enumeration was used to cover all 53 selected academic librarians in the State. There were three (3) research questions that were answered and Statistical Product and Service Solution (SPSS) version 25.0 was used to analyse the data. The findings revealed that a large percentage of respondents agreed they don't have any of the type of virtual reality technology listed in the research in their university library. Also, the librarians agreed that they perceive virtual reality will facilitate appealing virtual content that will encourage library usage. Furthermore, factors that can prevent the smooth implementation of virtual reality in academic libraries in Kwara State are Irregular power supply, Inadequate library budget among others. The study concluded that there is no doubt that virtual reality technology can provide a high-level effective library service. Finally, the study recommended that there should be orientation of the university management by librarians on the usefulness of virtual reality technology in academic libraries.

Keywords: Virtual Reality, Librarians, Academic Libraries, Virtual Reality Technology, Perception, Use, Kwara State

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Virtual Reality (VR) is a universal technological sensation that has had a significant impact on professionals in a wide range of professions, including medicine, engineering, aviation, military, and, more lately, librarianship, among others. Nowak (2020) dates the birth of augmented and virtual reality to 1838, when the stereoscope, a gadget that allows users to observe an item in what appears to be three dimensions (3D), was invented. Mistchell (2020) described VR as a computer-generated simulation in which a person can engage with an artificial 3D environment through the use of technological devices such as special eyewear with a screen or sensors-equipped gloves. Virtual reality is a technology- created world that is experienced by a person through senses: vision, hearing, touch, and others Varnum, (2019). Virtual reality mimics both action and reactions to that action. The computer synthesis of virtual reality properties and reactions is conducted in real-time to create a convincing set of reality sensations. Virtual reality should not be confused with augmented reality. Their principal difference is that virtual reality constructs a new artificial world, while augmented reality only introduces individual artificial elements into the perception of the real world.

Virtual reality systems are devices that fully simulate the interaction with the virtual environment by influencing all five human senses compared to conventional computer systems. Virtual reality (VR) is a rich visualization and analytical platform that contributes to the library's mission of providing access to all forms of information and supporting pedagogy and science across disciplines. Libraries are increasingly using virtual reality technology for research and

instructional purposes. It includes providing enhanced access to digital collections, offering new research tools, and creating new immersive environments for students (Cook et al, 2019). As described by Indiana University, Bloomington's Blogspot, Virtual reality "includes the use of 3D graphics and advanced interaction tools to immerse the real user in a simulated environment.

According to Adebayo (2021), virtual reality technologies can be used in university libraries to provide a variety of services. The equipment can be lent to users for a while, and librarians can use augmented reality to overlay additional information by using it for library orientation and to keep users informed about library services and activities. Kenndy (2019) noted that, nowadays, virtual reality (VR) techniques and technology are constantly advancing and developing, and are being incorporated into many areas of our daily lives. More and more architectural projects are incorporating this technology for the development and execution of projects, with multiple utilities from the architectural survey of complex historical buildings to the visualization of the project once the work has been executed. Emeka (2019) mention that, with the vast number of emerging technologies that are currently being introduced to the library world, it is essential for academic librarians to fully utilize these technologies to their advantage. However, it is also of equal importance for them to first make careful analysis and research before deciding whether to adopt a certain technology or not.

Alexy (2019) explained that virtual reality is a channel that librarians can utilize in order to disseminate information and guide patrons in their studies or research. And it becomes more inevitable for academic librarians to acquire related information technology (IT) skills in order to further improve the services they offer in their respective colleges and universities, Most importantly, academic libraries that have the tendencies to utilize new technologies in order to gain the interest of their tech-savvy users. It is very important to first assess whether a particular

technology will be useful in achieving their set goals and purposes before completely integrating it to their services. It is on this back drop of this that this study intends to investigate the perceived usefulness of virtual reality in academic libraries in Kwara state.

1.2 Statement of the Problem

Given that librarianship is considered as one of the oldest professions proves that librarians have successfully survived numerous wars, plagues, economic depressions, and varying social values and conditions. Librarians have always been known for their resourcefulness and adaptability. When the Internet became available to the general public, even though many believed that libraries will eventually vanish, librarians were able to learn how to incorporate it to the services they offer and turn the situation to their advantage. Presently, technology has transformed libraries in terms of collection makeup, services, operations, and functions Massiss (2018). In this age where a vast number of emerging technologies are being introduced to the library world, it is essential for librarians to learn how to wield these tools effectively and use this opportunity to further improve their service.

The recent boost of popularity in using virtual reality is tied to the developments that took place in mobile technology. When smartphones and tablets went mainstream in 2010, virtual reality also, became more publicly available. The recent public interest in virtual reality mobile games is unprecedented in the history of the field. Meanwhile, librarians have also noticed the potential advantages virtual reality can possibly bring to the profession and have also conducted researches to examine current state of virtual reality to evaluate library-related virtual reality applications, and analyze how virtual reality may affect librarianship. It is on the back drop of this that this study aims to investigate the perceived usefulness of virtual reality in academic libraries in Kwara State.

1.3 Research Objectives

The main objective of this study is to investigate the librarians' perception on the use of virtual reality in selected academic libraries in Kwara State. The specific objectives are to:

i. Identify the types of virtual reality technologies available in selected academic libraries in Kwara State;
ii. Determine the perceived usefulness of virtual reality in selected academic libraries in Kwara State; and
iii. Highlight factors that can prevent the implementation of virtual reality in selected academic libraries in Kwara State.

1.4 Research Questions

i. What are the types of virtual reality technologies available in selected academic libraries in Kwara State?
ii. What is the perceived usefulness of virtual reality in selected academic libraries in Kwara State? and
iii. What are the factors that can prevent the implementation of virtual reality in selected academic libraries in Kwara State?

1.5 Scope of the Study

The scope of the study is limited to three selected academic libraries in Kwara State which are University of Ilorin, Kwara State University and Al-Hikmah University. The population were the staff of the library, which comprises of both professional and para-professional staff of the library. For libraries to continue to be at the forefront of information provision, they must continue to

provide accurate information to their patrons by meeting their information needs regardless of the evolving changes in this ICT era. A descriptive survey research design was used and purposive sampling technique was also used to select respondents from the total population, the feed backs gathered from the respondents were analysed.

1.6 Significance of the Study

The study is will add more knowledge to existing literatures on perceive usefulness of virtual reality in academic libraries In addition, the result of this study will provide useful insights that might help all higher educational institutions, particularly the universities, polytechnics and colleges of education libraries' management to formulate strategies for adoption of Virtual reality for information services delivery. The findings would help stakeholders especially librarians understand and appreciate the usefulness of virtual reality in academic libraries in this modern revolution of ICT. This study also will hasten the readiness of the librarians in Nigeria and Africa to use virtual reality technology as a tool for sharing resource activities in their various libraries through library cooperation.

1.7 Operational Definition of Key Terms

Academic Libraries: Is a library that is attached to a higher institution which serves two complimentary purposes to support the school's curriculum an support the research of the university.

Librarian: A librarian is a person who works professionally in a library providing access to information, and sometimes social or technical programming, or instruction on information literacy to users.

Library Officer: The Officer is responsible for managing daily operations within one or more areas of the library and for carrying out a variety of technical and administrative.

Virtual Reality: Virtual reality is a simulated experience that employs 3D near-eye displays and pose tracking to give the user an immersive feel of a virtual world.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter offers an in-depth analysis of perceived usefulness of virtual reality technology in academic libraries in Kwara State. The review is organized into the following sub-headings:

2.2 Concept of Virtual Reality;
2.3 Types of Virtual Reality;
2.4 Benefits of Virtual Reality Technology in Libraries;
2.5 Perceived Usefulness of Virtual Reality Technology in Academic Libraries;
2.6 Application of Virtual Reality Technology in Academic Libraries;
2.7 Advantages of Virtual Reality for in Academic Libraries;
2.8 Challenges of Virtual Reality in Academic Libraries; and
2.9 Appraisal of the Literature Reviewed

2.2 Concept of Virtual Reality

Virtual reality (VR) is one of the technologies that is increasingly starting to get adopted in libraries. While the interest in Virtual Reality is growing, it is still considered an expensive piece of technology which not many people can't afford. In the words of Adeyeye (2019). Libraries could potentially be a good venue to introduce VR to the academic library users without the cost from end users, but libraries currently have limited understanding of how to best offer this technology in libraries. Stressing that, as of now, much research has been done on the possibilities of using VR for both educational and entertainment purposes. Furthermore, many technologies pass through a 'hypercycle' of hope and disillusion before they may become accepted into common

use, but the current wave of excitement and anxiety around virtual reality technologies in academic libraries is remarkably strong.

According to weber (2019), virtual reality technology refers to the use of computer technology as the core of modern high-tech production of realistic visual, auditory, tactile and other integrated virtual environment, and users interact with objects in the virtual world in a natural way by means of necessary devices, thus producing feelings and experiences such as being in the real environment. Furthermore, it is a new type of human computer interaction that emerges with the development of new technologies including computational graphics, multimedia technology, artificial intelligence, human machine interface technology, sensor technology, highly parallel real-time computing technology, and human behaviour. Max (2018) explain that Virtual reality technology provides users with a virtual environment that can achieve interoperability, as well as a sense of immersion with a high degree of immersion, which makes virtual reality technology widely used in product design and display in various industries virtual reality system usually consists of visual, auditory, olfactory, taste, tactile and other perceptual information.

In order to integrate into the realistic virtual environment, participants not only need to interact with digital gloves, data clothes, spherical screen, head blue display, stereo headphones and other devices, but also need to interact with the virtual environment generated by computer software environment and development tools. On the other hand, the system constructs a virtual environment generated by the integration of computer software and development tools and hardware. In other words, the computer software and hardware in the system can not be separated and are closely integrated verisimilitude.

According to Jean (2018), the human desire to inhabit imaginary worlds predates the current interest in virtual reality (VR) technologies. If we stretch the definition of "immersive media," we could even trace the birth of VR to early fireside storytelling, in which flames and tales presented orally were the first multimedia experience for humans, explaining that We can follow the development of techniques for producing immersive experiences through the elaborate history of storytelling and theatre, as humans have long desired to inhabit imaginary lands and virtual worlds fashioned through the various arts and sciences available at the time. Furthermore, to this Inmoh (2017) stress that in the modern era, two intellectual trends have been particularly instrumental in the conceptual development of what we today call "VR": the rationalization of physical space through geometric projections and measurement, and perceptual research and the quest for VR is re-emerging at a time when academic libraries are changing how they allocate their scarce resources.

They are quickly shifting their focus from traditional collection development to the establishment of centralized, collaborative workspaces and technology-oriented service centers (Massis 2019). In the era of comprehensive online databases of journal articles, Google Scholar, and other online discovery and access portals through which much of the universe researchers are rarely visiting academic libraries for the purposes of solely locating secondary source material (Dewan 2012; Turner, et al. 2013; Van Orsdel and Born 2012). Instead, scholars are relying on academic libraries to provide meeting spaces, specialized computer software and hardware, research data management, digital scholarship support, and a range of other research and teaching services. Recognizing this shift in usage, academic libraries are investing in research and development initiatives that aim to provide new services and technologies, including virtual reality, to further support research and teaching.

Namachchivaya (2017) mention that virtual reality stands out among these new services because it can impart special analytic and teaching benefits, while providing access to important 3D research data that researchers are creating at an increasing pace. Because academic libraries function as centralized hubs for scholarly activity and must be discipline-agnostic, serving patrons from all research fields, they have the potential to be effective sites for hosting virtual reality for a range of users. Adeh (2019) stress that current utilization of immersive technologies in the education sector has proven to provide an effective utility for promoting the learning of various subjects. Virtual reality are examples that clearly illustrate the utilization of these new technologies, which provide opportunities to promote lifelong learning, libraries are no longer places where users go to read-only print books (Kwanya, Stillwell & Underwood, 2019). ICT is now increasingly being deployed to aid effective service delivery and learning; interactive learning spaces like Makerspace and Virtual Reality Spaces for practical learning; as well as swift comprehension and gaming for entertainment (Kwanya, Stilwell & Underwood, 2012).

Virtual reality has gained a significant level of attention from university libraries especially those that reside in advanced nations of the world. Indeed, virtual reality content is blossoming in all areas of human endeavours (Figueroa, 2018; Ocholla et al., 2021). Many scholars have highlighted ways VR can be deployed in libraries. Stimpson (2019) affirmed that an online Virtual Reality, known as Second Life, can provide orientation, outreach, tour, and other user education needs in libraries. Also, self-guided podcasts and iPod application tours have been used to provide virtual excursions and orientations for libraries (Mikelle & Davidson, 2018). Also, the University of Illinois library researchers worked on the HoloBook Project which created VR technology e-book reading experiences. The technology enabled library patrons to research and read e-books from virtual environments (Head & Isenberg, 2019). Virtual reality can also be used for data

visualization, curation, and storytelling to keep users engaged, satisfied, and willing to visit the library to meet their diverse information needs. Despite the aforementioned prospects of the deployment of VR in libraries, information on librarians' willingness to implement and use them in university libraries in Delta and Edo states in Nigeria is still very scanty.

According to Kamal (2017), virtual reality technologies had already generated a substantial progress in this regard by completely immersing the user inside a synthetic environment, so that he 'cannot see the real world around him. Explaining further that virtual Reality only meant that our real-world environment is extended by digital instruments which are equipped with sensor interfaces sound, video, touching to enhance men-machine communication. further to this, Ekpoh (2018) stated that virtual reality technology is replacing the real world with a computationally simulated one. In the words of Akinbi (2020) virtual reality is defined as an artificial and computer-generated environment making it possible for individuals to interact in a real environment through five sensory channels which are hearing, touch, sight, taste and smell.

However, the achievement of current technological progress is limited to the visual channel considering the fact that sight is generally the most developed sense of a human being, and secondly the hearing channel. The simulated environment has three-dimensional worlds which are experienced through immersive devices, allowing users to interact with the visual world as if they were physically present. Also, Kolawole (2020) stated that virtual reality is a highly interactive, computer-based, multimedia environment in which the user becomes a participant with the computer and that the characteristics of VR are summed up with Immersion, interaction and imagination. The study of Oyelude (2018) showed that libraries, museums, and archives are eager to include virtual reality into their offerings to users since they are trendy, amusing, and increases user engagement. Pope (2018) investigated the need for creating special spaces within the library

for VR technologies. It was reported in the study that libraries are increasingly implementing virtual reality as educational and exploratory tools.

Greene and Groenendyk (2021) reviewed virtual and augmented reality services available in university libraries. The research showed that a large proportion of Association of College and Research Libraries (ACRL) member libraries do provide access to VR Akinbi (2020) stated that Immersion can be defined as a physical feeling of being in a virtual space. Explain that This is achieved by the sensory inter-faces which surround the user. Further to this Interaction is about the user's ability to alter the environment and to receive feedback based on the interaction. The goal is for the user to have a feeling of presence. While Imagination is how Virtual reality makes it possible for people to perceive non-existent things, creating the illusion of them being real Sheridan, (2020). Virtual Reality technologies have first been applied in sectors such as in military, business, and medicine for training purposes. Studies have shown how students can benefit from directly interacting with objects and learning within through senses, vision, hearing, touch, and others. Adedeji (2018) explain that, in situations where no artificial markers can be applied, natural features of objects can be used instead, e.g., by identifying interest points, tracking edge features, or high differences in color or contrast. Stressing that, virtual reality displays must be capable of combining the real environment and the virtual environment.

Abudul (2017) said users have to be able to interact with the virtual world by movement navigation, by selecting objects e.g., physically grabbing a marker or pointing on a virtual object, manipulation of a virtual object changing a parameter, e.g., turning, scaling, moving the object, input of symbols using gesture or a virtual keyboard, or speech-driven. Jerry (2019), explain that Virtual reality mimics both action and reactions to that action. The computer synthesis of virtual reality properties and reactions is conducted in real-time to create a convincing set of reality

sensations, explaining that Academic libraries are increasingly using virtual reality technology for research and instructional purposes variety. this includes providing enhanced access to digital collections, offering new research tools, and creating new immersive environments for students. mixture of classes of objects, With the real environment consisting solely of real objects and the virtual environment consisting solely of virtual objects as the two opposite extrema. there is the artificial Reality in between in which real world and virtual world objects are presented together within a single display

Adedeji (2018) explain that in situations where no artificial markers can be applied, natural features of objects can be used instead, e.g., by identifying interest points, tracking edge features, or high differences in color or contrast. Stressing that, virtual reality displays must be capable of combining the real environment and the virtual environment. An optical see- through display uses an optical element partially transmissive and partially reflective to combine the view of a user of the real world with computer generated images of virtual objects. On a video-see-through display, the real world is captured using a video camera and the image is modified electronically using a Digital Combiner to add the virtual objects. The combined image is then displayed on a screen emphasizing that Based on those two fundamental principles different categories of displays can be found this are head-mounted displays e.g., smart eyeglasses, handheld displays e.g., smartphones, tablet computer and projective displays e.g., head-up displays using the windscreen of cars or airplanes.

In addition, Abudul (2017) said users have to be able to interact with the virtual world by movement navigation, by selecting objects e.g., physically grabbing a marker or pointing on a virtual object, manipulation of a virtual object changing a parameter, e.g., turning, scaling, moving the object, input of symbols using gesture or a virtual keyboard, or speech-driven. The goal is for the user to have a feeling of presence. While Imagination is how Virtual Reality makes it possible for people to perceive non-existent things, creating the illusion of them being real Sheridan, (2020). Virtual Reality technologies have first been applied in sectors such as in military, business, and medicine for training purposes.

2.3 Types Virtual Reality

Virtual reality is a technology that has been diversifying, leading to the development of surprising solutions. There are three types of virtual reality that have managed to capture the attention of companies and users, each offering a different degree of immersion. The result is a unique experience, depending on the desired effect.

Non-immersive virtual reality: This is a modality that does not require the use of full equipment or virtual reality devices. Instead, a screen, such as a computer or smartphone, is used to realize the experience. In addition, the user interacts with the environment through standard input devices such as a mouse, keyboard or controller. According to Adams (2019) One of the advantages of non-immersive virtual reality is that it is more accessible, as it does not require a large investment in peripherals. It should be noted that many of them are high-end, which makes them difficult to access for many users. Also, it does not produce situations of dizziness or temporary disconnection that some people may experience with immersive virtual reality. It is therefore an attractive option.

In the words of Ndoma (2017) Despite the limitations it may have, many interesting applications have been designed, such as the generation of simulations or interactive environments to teach complex concepts and skills, which enhances learning.

Mixed virtual reality: This VR model allows users to interact with objects while they are in relation to the physical environment. Alexi (2019) stress that to achieve this, specialized vision devices are used, such as HoloLens or Magic Leap glasses, which superimpose virtual holograms on the visual field. Adding the one of their most positive features is the ability to anchor virtual objects to the real world. This means that they can be brought into the physical environment, as they appear to be part of it. Explaining that as with non-immersive virtual reality, non-immersive virtual reality has many different practical and creative applications. Professionally, it is used in the architecture and design industry to visualize and present 3D models of buildings and urban projects in a real context. It has also been valuable in the field of maintenance and repair, where technicians receive real-time instructions via holograms while performing physical tasks.

Full immersive virtual reality: full immersive virtual reality is the most widely known and used type. According to Richard (2018) It is an experience capable of completely immersing the user in a digital environment, However, it is essential to have the right equipment, such as glasses with headphones or a helmet, and motion controllers, explaining that it is possible to perceive objects as real and manipulate objects, move around and enjoy a virtual world. Furthermore, Alexi (2019) mention that its applications have been gradually expanding, especially in the field of entertainment, but it also stands out in education, training and simulation. the immersive experience offered by virtual reality, its popularity continues to grow, as it provides a unique sense of presence and participation.

By using it, it is possible to be transported to virtual places of times gone by Adenifunja (2020) explain that as virtual reality technology advances, the focus is on improving visual quality and interaction to increase immersion and make the experience even more realistic and engaging. In the word of Alexi (2019) in a few years, we may find it hard to tell the difference between the two worlds, and we will enjoy unparalleled entertainment. These are the most prominent types of virtual reality today. They create a wide variety of experiences, ranging from connecting the physical world with the digital world, to completely introducing us to it. Whether for entertainment or work, it is a very useful technology. Kolawole (2020) explain that Projection-based virtual reality is in the context of static space and can display virtual reality experience only in the projected areas. So, only if a physical surface over which you wish to superimpose a digital object stays within the area where your device camera projects will be able to see the experience and see the replaced image with added digital content. Since more and more people appreciate mobility, manufacturers create powerful systems in compact bodies.

In the words of Irikefe (2021) contrary to non-immersive virtual reality, a fully immersive virtual technology ensures that you have a realistic experience within the virtual world. It'll give you a sense of being present in that virtual world, and everything is happening to you for real. This an expensive form of virtual reality that involves helmets, gloves, and body connectors with sense detectors these are connected to a powerful computer. Your movements, reactions, and even a blink of an eye are detected and projected within the virtual world. A semi-immersive virtual reality according to Markel (2019) is a mixture of non-immersive and fully immersive virtual reality. this can be in the form of a 3D space or virtual environment where you can move about on your own, either through a computer screen or a virtual reality box/headset. So, all activities within the virtual world are concentrated toward you.

In the words of Attah (2019) collaborative virtual reality is a form of a virtual world where different people from various locations can come into contact within a virtual environment, usually in the form of 3D or projected characters. For example, unity game development has also embraced the concept of virtual collaboration, much like the video game called PUBG (Players Unknown Battle-Ground), where tons of players come into existence as individual virtual characters that they can control. Much like the transformative impact of imaging development in its sector, virtual reality technologies are paving the way for innovative experiences across various domains. Here they can interact with each other through microphones, headsets, and chatting.

Pope (2018) explain that Virtual reality facilities deployed in university libraries include HTC VIVE, Google Cardboard, the Oculus Rift developed by Facebook, Gear Virtual reality developed by Samsung, and PlayStation Virtual Reality developed by Sony, to mention just a few. According to Johnston (2020), the Brigham Young University Library has an HTC VIVE VR system that could be either reserved or accessed by library users. As affirmed by the Illinois University Library (2017), the Grainger Engineering Library's IDEA Lab Virtual Reality Lounge contains a work area for communities using VR systems such as HTC Verve Pro with Wireless Kit, Oculus Go, Oculus Quest, Oculus Rift loanable kits available for check out at Grainger Circulation Desk, Valve Index, and Microsoft HoloLens VR workstations with software like steam, unity, unreal, Mixed Reality Portal. The University of Florida affirmed that it has Virtual Reality facilities like Oculus Rift with Touch Controller, HTC Verve, Samsung Gear, Google Daydream, plus Microsoft HoloLens which are all available for loan to users.

2.4 Benefits of Virtual Reality Technology in Academic Libraries

By saving space and time, libraries can improve their efficiency, reduce costs, and offer users a more convenient and efficient way to access information and resources. As virtual reality technology advances, we expect more benefits for users and libraries. Some of those benefit as explain by Attah (2019). Furthermore, it Increasing Flexibility and Customization by incorporating virtual reality in libraries, virtual reality technology allows users to access information and resources in a way that suits their individual needs and preferences. For example, users can view books and resources in traditional or virtual reality formats, with added visual and audio elements. Users can also customize their virtual reality experience by selecting the type of information they want to see, such as audio descriptions or interactive features. This increased flexibility and customization means that users have more control over their learning experience and can tailor their experience to suit their individual needs and preferences.

Virtual reality also has the potential to shape the library of the future in terms of the ways in which patrons access traditional library collections. Consider the value of embodied browsing activity in the physical book stacks. Serendipitous information retrieval, or "the chance encountering of information," has been shown to benefit early-stage research and instruction, compared with common query-based search and retrieval paradigms (Foster and Ford 2017). A significant amount of potentially salient source material can be parsed efficiently in the physical book stacks by simple, intuitive body motions like craning the neck, bending down, or turning one's head. Each of these natural search behaviors can be replicated in virtual reality, which means that collections can be browsed and analyzed without needing to first learn the special keyboard combinations or software-specific interfaces necessary for using computer-based catalogs and other retrieval systems. As book collections are increasingly moved to off-site storage, academic.

In addition, Irikefe (2021) explain that it also Improve Access to Information, stressing that virtual reality in libraries has also improved access to information, that Libraries now use virtual reality to create interactive displays, showcasing books, artifacts, and other resources. This has made it easier for users to find what they are looking for and access more information about a particular item. Users can now get a full view of a book, including its cover, pages, and back matter, without physically touching it. This is especially beneficial for preserving rare and fragile books that can only be handled sometimes. it also encourages learning as it allows reading and learning to be more interactive. It encourages users to be more involved in the process. Virtual reality games, puzzles, and quizzes have been added to library resources, making learning fun and engaging. This is especially beneficial for children, as it helps them develop their skills and knowledge in a fun and interactive way.

Also, Akinbi (2020) emphases that One of the key advantages of incorporating virtual reality technology in libraries is its ability to expand the reach of libraries beyond their physical walls. With virtual collections and resources, users can access information and books from anywhere, at any time. This not only makes information and resources more accessible, but it also means that users do not need to be physically present in the library to access its collections. Thus, by incorporating virtual reality technology, libraries can expand their reach, making their collections and resources available to a broader audience. further to this, Igwe (2018) explain that libraries can also use virtual reality technology to improve their efficiency, as they are no longer required to maintain physical copies of books and resources. This reduces the costs associated with purchasing, storing, and maintaining physical copies. It allows libraries to redirect those resources towards other initiatives, such as expanding their collections, offering more programs, or investing in new technology.

2.5 Usefulness of Virtual Reality Technology in Academic Libraries

Virtual reality according to Hannah (2020) is a technology that has the potential to revolutionize the way library's function, providing users with new and innovative ways to engage with the collections and resources available. From virtual reality integration and gamification to collaborative virtual reality experiences and increased use of virtual reality in library programs, the future of virtual reality in libraries is exciting and full of potential, explaining that these developments will allow libraries to play an even more significant role in the future of education and learning, providing users with a more immersive and interactive experience. Harnod (2018) explain that since the discussed applications of virtual reality in libraries are fixed to the place of the library, users have to come to the library to be able to use the virtual reality app, Although, this seems to be a trivial fact, users will be forced to visit the library and then they will get a lot of additional information. Since virtual reality helps to better find the way in the library, media books can be found much easier and faster.

Saandy (2018) stress that ancillary information can be conveyed much simpler, more extensive and more context specific with virtual reality, using 3D, information can be perceived and imagined more easily. Maintaining that, virtual reality can be used whenever complex information in the library shall be presented to the audience. added value arises when the physical holdings of the library can be combined with the virtual holdings. then Virtual reality can be used to link different types of the library holdings and to show all media since not everything can be presented in the catalogue of the library. By filtering and selecting content elements more precise results can be presented to users. Akinbi (2020) explain that, you can recreate your physical libraries using virtual reality to allow visitors to take virtual tours and access library resources virtually. This will provide users with an immersive and interactive experience, allowing them to explore and engage

with the collections and resources available in a new and exciting way. Virtual tours will also save space, as libraries will no longer need to display items physically.in addition to the usefulness. Hannah (2020) mention that virtual reality-enabled reading is expected to become increasingly popular in the future. Libraries are expected to offer a broader range of virtual reality enabled books, providing users with an interactive and engaging reading experience.

Virtual reality-enabled books will also make learning more fun and interactive, making it easier for students to develop their skills and knowledge. Furthermore, personalized learning is another usefulness of virtual reality technology in libraries as it is also expected to provide personalized learning experiences, which allow libraries to create customized educational programs based on the needs and interests of individual users. Cheng (2018) This will make learning more engaging and effective, as users will receive tailored content designed to meet their needs. And also increased accessibility for persons with disabilities .Willams (2017) virtual reality technology, in libraries increases accessibility for persons with disabilities, Virtual reality technology has the potential to provide users with disabilities with a more accessible and inclusive experience, allowing them to interact with books and resources in a way that suits their needs, for example, visually impaired users can use virtual reality technology to read books and access information with the help of audio descriptions and voice-overs.

Similarly, Chenge (2018) explain that users with physical disabilities can use virtual reality technology to interact with readers and resources without needing physical dexterity so, incorporating virtual reality technology into libraries can make their collections and resources more accessible to all users, regardless of their abilities. In addition to the above, Vincent (2019) stated that increase collaboration and engagement is another usefulness of virtual reality technology in libraries as it has the potential to bring people together, allowing them to collaborate

and engage with each other in a virtual environment. For example, libraries can use virtual reality technology to host virtual book clubs and reading groups, where users can discuss books and resources in a virtual setting. virtual reality can also create virtual study groups where students can work together and learn from each other in a virtual environment. Similarly, Jon (2019) mention that incorporating virtual reality technology into libraries can increase user collaboration and engagement, creating a more social and inclusive learning experience.

Vincent (2019) opines that virtual reality (VR) is a rich visualization and analytical platform that contributes to the library's mission of providing access to all forms of information and supporting pedagogy and science across disciplines. Adding that academic libraries are increasingly using virtual reality technology for research and instructional purposes variety. It includes providing enhanced access to digital collections, offering new research tools, and creating new immersive environments for student. Chowdhury (2018) stresses that virtual reality mimics both action and reactions to that action. The computer synthesis of virtual reality properties and reactions is conducted in real-time to create a convincing set of reality sensations. Virtual reality should not be confused with augmented reality. Their principal difference is that virtual reality constructs a new artificial world, Virtual reality systems are devices that more fully simulate the interaction with the virtual environment by influencing all five human senses compared to conventional computer systems.

According to Fianko (2018) With virtual libraries, the quality of academic library collection will be enhanced; staff and students will have access to databases for teaching and research that virtual libraries will improve the quality of teaching and research in higher institutions through the provision of current electronic books, journals and other library resources Chowdhury (2018). This enhances scholarship, research and lifelong learning through the establishment of permanent

access to shared virtual collections (Okebukola, 2018). The virtual library has the opportunity to address the paucity of teaching and research materials in the libraries of higher institutions in Nigeria as well as giving room for sharing research outputs with global community among the institutions and the local researchers.

2.6 Advantages of Virtual Reality in Academic Libraries

The advantages of virtual reality for libraries according to mark (2020) comprised seven main codes: enrichment of library services, sociocultural excellence, upgrading the educational level, potential benefits of software, helping librarians, facilitating medical affairs, and entrepreneurship. Essein (2018) The most important advantage of virtual reality is the ability to meet modern needs. Attracting the audience and supporting researchers, improving the educational level, strengthening library services, creating marketing opportunities for publishers, entrepreneurship, optimizing library technical affairs, facilitating library activities, technological security, attractiveness, social and cultural excellence are opportunities for developing medical university libraries. By using virtual reality, media such as books can be found more easily and quickly, and information can be transferred more simply and extensively.

Virtual reality technologies can be used in university libraries to provide a variety of services. In an academic or research library setting, Esposo-Betan (2017) investigated the benefits and drawbacks of adopting virtual reality for library orientations. The findings of the study showed that employing virtual reality in academic or research libraries is beneficial since it may be utilized for library orientation, dissemination of information and to keep users informed. The equipment can be lent to users for a while; librarians can use virtual reality to overlay additional information

by using it in library brochures, manuals, and posters. Kanny (2021) conducted a study to see how a virtual reality library orientation affected anxiety and self-efficacy.

The research findings indicated that using virtual reality boosted students' insights into the library, enhances their ability to navigate the library, improved students' confidence level in regard to library utilization, and increased user engagement. Massis (2018) investigated the application of virtual and augmented reality in libraries. The findings show that Aurasma, which is a Virtual reality App, can be utilized for live exhibitions in the library. The technology can also be used to boost students' information literacy level and their grasp of how to use the library. Dianel (2018) investigated the use of virtual reality to aid students in their learning of information literacy. The study concluded that virtual reality has demonstrated a great potential as the technology librarians can utilize to help students of all ages to learn how to use geographic information.

Demsey (2018) Gamification improves learning in this field by providing a more immersive 3D learning environment. Virtual reality can also provide library education for university libraries with minimal staffing. Ogundare (2019) reported that Virtual reality is a comprehensive integration technology, involved with computer graphics, sensor technology, human-computer interaction techniques, artificial intelligence and other fields. With computer technology as core, it combines with other scientific technologies to generate lifelike three-dimensional vision, auditory sense, smell, touch and other senses, enabling users to experience and interact with the virtual world in a virtual environment by relevant equipment and devices. Adedokun (2017) cited in Obukowho (2020) explain that computer system can promptly conduct complex calculation with movement of user positions, transmitting accurate images of the virtual 3D world to make users feel like being in a real world. This technology integrates with and reserves the latest developed achievements of modern computer graphics technology, sensor technology, artificial intelligence, display

technology, parallel internet processing technology and other technologies, generating lifelike high-tech analog system by computer technology.

2.7 Challenges of Virtual Reality in Academic Libraries

Despite the prospects in the deployment of Virtual reality technologies in university libraries, there may be some challenges militating against their deployment. Al-Lamki (2020) investigated the opportunities and threats of interactive applications such as Virtual reality in university libraries. These are high cost, Security and privacy, network issues, Substantial time commitments, lack of 3D design interface, Users acceptance and Motion sickness are some of the factors militating against the full adoption of Virtual reality in university libraries. Santos and Esposo-Betan (2017) investigated the benefits and drawbacks of adopting Virtual Reality library orientations in academic and research libraries. Some of the drawbacks identified are difficulty in implementing the technology, dependence on Internet speed, usage by youngsters only, and the need for specialized devices. McDonald, and Carlisle (2019) investigated the challenges and solutions for academic libraries virtual reality.

The challenges identified included simulator sickness often resulting in a frequent disconnect between what the eyes and ear perceive, accessibility barriers, high cost of VR equipment, physical constraint to user movements due to the wiring that connects the VR headset to the PC, and risk of disruptive or damaging reactions from users. Ziaei (2021) investigated VR tools in medical school libraries, identifying applications, benefits, and problems, and offering a model. The challenges mentioned were economic, technical, and cultural stumbling blocks. Kirsch (2019) confirmed that using virtual reality headsets has health hazards for some people, including motion sickness, dizziness, and, in some cases, epileptic seizures. It is key to communicate this to students

before they check out the equipment to boost their awareness to stop using it right away if they have a negative reaction.

Atuase (2017) mention that Building sustainable virtual libraries requires appropriate technological infrastructure. This infrastructure includes telecommunication, servers, application systems and software applications. Telecommunication infrastructure is a major factor in the deployment of information and communication technology, particularly for the implementation of a virtual library. Computerization involves a huge amount of money but it is a necessary project. The implementation of a virtual library implies that libraries will spend more on hardware and software, licensing, training of librarians in new technologies especially in the area of texts selection, scanning, verification and indexing of the materials to be digitized as well as employment of experts with web technologies skills to support and manage them. Copyright holders have to be contacted and rights obtained. Money is needed to translate content into digital form and to access the resources.

A powerful server is required, supported by specialized software and personnel. The server must operate all day, and new materials should constantly be added. Web technology skills are needed to maintain web servers that host locally digitized materials and other digital resources hosted remotely as well as maintaining proxy access to restricted resources. Nigeria has an acute shortage of digital systems librarians, information and web technology literate staff in libraries to install and manage technology networks (Ashcroft & Watts, 2021). Inconsistent electric power supply in Nigeria is a major problem. Virtual library cannot exist in this situation because web servers that host locally digitized contents.

2.8 Appraisal of the Literature Reviewed

The comprehensive review of literatures on perceived usefulness of virtual reality in academic libraries shows the emergence of digital technologies has fundamentally transformed the way organizations operate and therefore adjusting strategic business outlook and operational practices. consequently, the review begins with an introduction, definition and explanation of virtual reality technology high lighting the types, benefit, usefulness, Advantages and challenges virtual reality in academic libraries. However, there are few concerns regarding these technologies in terms of competency Bearing this in mind, that the extraordinary possibilities offered virtual reality may even lead some people to ascribe to this technology the Midas touch, according to which it will figuratively convert into gold anything it touches. After all, one of the major attractions of virtual reality is that it often seems to show clearly and directly how to apply some pieces of information without requiring much effort from the librarian to the users

Literature shows that using virtual reality is advantageous to academic/research libraries. It is true that the hype an emerging technology brings is volatile and should never be the basis for any decision making, especially for academic/research libraries that can spend their resources in many other endeavors. However, when using virtual reality in certain library activities, such as orientation programs, reference information query and current awareness is supported by hard evidence, it means that its implementation will be worthwhile. For librarians, virtual reality should not be viewed as a technology only but as a medium to relay information. Librarians should use various methods or technologies in order to help users find the information they need.

The literature review offers a through and balanced summary of the body of knowledge about perceive usefulness of virtual reality technology in academic libraries. Through synthesis of multiple sources and comprehensive analysis the review provides a solid theoretical and empirical frame work for the research. It discusses the essential factors that lead to the usage of virtual reality in academic libraries Also, it draws attention to difficulties and challenges of virtual reality in academic libraries. Lastly, the examination of perceive usefulness of virtual reality literatures provide researchers, scholars and practitioners with useful insight into the subject matter and establishes the foundation for the future investigation in the area.

CHAPTER THREE

METHODLOGY

3.1 Introduction

This chapter looks into the step-by-step procedures the research adopts in the course of this study. The sub -heading will be discussed include the research design, population of the study, sampling technique and sample size, method for data collection /research instrument, the data analysis procedure and the validity of the data analysis procedure and the validity of instrument.

3.2 Research Design

The study adopted a survey research design. According to Raheem (2020) research design is the prior planning of the methods to be employed for gathering the essential data and the techniques to be utilised for analysis, keeping in mind the purpose of the research as well as the feasibility of staff, time, and money. To address the overall study topic, the research design dictates how participants are selected, what variables are included and how they are modified, how data are gathered and evaluated, and how unnecessary variability is managed it will enable the researcher elicit data from respondents to investigate, perceived usefulness of augmented reality and virtual reality technologies for dissemination of information in academic libraries in Kwara State

3.3 Population of the Study

The population of the study comprise the professional and para-professional staff in the selected academic libraries: University of Ilorin library, Kwara State University library and Al-Hikmah University library. Marcus (2019) defines a population as any number of characteristics within a group that a statistician uses to conclude the subject of a study. The population is the total collection

of objects to be observed or studied. It is a set of universal units from which samples are drawn. The target population used for this study consists of librarians and library officers in three selected university libraries in Kwara State, Nigeria. The total population for this study is seventy-seven (77). The staff was used as the study population because they are considered to be the ones to give valid and most reliable responses concerning the topic being researched upon. The population study of the university libraries is presented below:

Table 3.1: Study population of librarians and library officers in the 3 selected university libraries in Kwara State.

University Library	Librarians	Library Officers	Total
University of Ilorin Library	32	12	44
Kwara State University Library	15	7	22
Al-Hikmah University Library	4	7	11
Total	**51**	**26**	**77**

3.4 Sampling Size and Sample Technique

The sampling techniques adopted by this study is simple random as only the library staff will be useful for the study which will constitute the sampling frame. A sample is a selection of a small section of the population for observation and analysis. Sampling is the method of selecting representative samples from a whole population. It is the act, method, or technique of selecting a representative sample of a population to determine its parameters or features. This method will be adopted because it allows the entire library staff to be selected as respondents and target audience for this research, and the samples size will be the total staff of the library who are professionals and paraprofessionals. The total enumeration technique was used to cover all 77 librarians in the selected university libraries in Kwara State, Nigeria.

3.5 Research Instrument(s)

A well-structured questionnaire was used to provide the needed information from the research questions as this study tried to investigate perceived usefulness of virtual reality technologies in academic libraries in selected academic libraries in Kwara State. The questionnaire titled "librarians' perception on the use of virtual reality technology in selected academic libraries in Kwara State" was designed to collect the needed information from the librarians and library officers in selected university libraries in Kwara State, Nigeria.

3.6 Validity and Reliability of the Instrument(s)

Koter (2018) defined validity to be the extent to which a data collection tool, such as a questionnaire, measures what it is intended to measure. To determine the validity of the questionnaire used in this study, three experts in the field of library and information science will review the instrument (the questionnaire) for data collection to determine its appropriateness and content coverage in terms of acceptability, adequacy, and relevance to the stated objectives. comments, suggestions, and corrections will be incorporated to produce a final draft of the instrument. Reliability, on the other hand, refers to the degree of consistency with which an instrument measures what it claims to measure.it is the degree to which repeated measurements of the same phenomenon yield identical results.

3.7 Method of Data Collection

Data was collected personally by the researcher. The researcher visited the selected universities and administered the questionnaire to the respondents and wait to retrieve them back immediately. The questionnaire was constructed in consonance with the research question and reviewed in terms of format and items.

3.8 Method of Data Analysis

The data collected were subjected to comprehensive data analysis using the Statistical Packages for the Social Sciences (SPSS) software. Data analysis is the systematic application of statistical or logical methods to explain, illustrate, and assess data. Frequency counts, percentages, means, and standard deviations were comprised the descriptive statistics employed, and the findings were be presented in tables.

3.9 Ethical Considerations

This study was carried out in line with the ethical values of Department of Library and Information Science. Furthermore, the researcher ensure that respondents are will and cooperative on giving information required. To further make use of the ethical consideration, the information provided by the respondents will be treated with utmost confidentiality. The rules of confidentiality will be fully observed.

CHAPTER FOUR

RESULT AND DISCUSSION OF THE FINDINGS

4.1 Introduction

This chapter contains the results and analysis of the data gathered from the respondents undertaken to study the librarians' perception on the use of virtual reality in academic libraries in Kwara State, Nigeria. Moderating variables such as age, gender, designation, qualification, and years of working experience were also taken into consideration.

4.2 Response Rate

Table 4.1: Response Rate

Administered Questionnaire	Retrieved Questionnaire	Valid	Percentage (%)
77	61	53	68.8

The total of 77 copies of questionnaires was administered to the librarians and library officers in the three selected university libraries in Kwara State. 61 were retrieved and only 53 were valid which resulting as response rate of 68.8%. As shown in table 4.1.

4.3 Demographic Data of the Respondents

Table 4.2: Distribution of Demographic Information of the Respondents

University Library	Frequency	Percentage (%)
University of Ilorin Library	33	43.4
Kwara State University Library	13	24.5
Al-Hikmah University Library	7	13.2
Total	**53**	**100.0**

Highest Qualification	Frequency	Percentage (%)
ND/HND	5	9.8
BSc/BA/BLIS	27	50.9
PGD	5	9.8
MLIS	16	30.2
Total	**53**	**100.0**

Age	Frequency	Percentage (%)
20-34 years	14	26.4
35-44 years	26	29.1
45-54 years	9	17.0
55 years and above	4	7.5
Total	**53**	**100.0**

Gender	Frequency	Percentage (%)
Male	28	52.8
Female	25	47.2
Total	**53**	**100.0**

Years of work experience	Frequency	Percentage (%)
1-5 years	14	26.4
6-10 years	26	49.1
11-15 years	8	15.1
16-20 years	5	9.4
Total	**53**	**100.0**

Professional Status	Frequency	Percentage (%)
Assistant Librarian	12	22.6
Librarian II	21	39.6
Librarian I	10	18.9
Senior Librarian	7	13.2
Principal Librarian	1	1.9
Total	**53**	**100.0**

Section/Unit	Frequency	Percentage (%)

Cataloguing	17	32.1
Circulation	12	22.6
Serials	3	5.7
Acquisition	6	11.3
E-library	10	18.9
Reference	5	9.4
Total	**53**	**100.0**

Table 4.2 showed that 7(13.2%) of the respondents were from Al-Hikmah University library, 13(24.5%) were from Kwara State University library, while 33(43.4%) of the respondents were from the University of Ilorin. This implies that the University of Ilorin library had the highest number of respondents. In the qualification section, it was shown that 5(9.4%) of the respondents had ND/HND qualification, 27(50.9%) had BSc/BA/BLIS, 5(9.4%) had PGD while 16(30.2%) had MLIS. This implies that the majority of the respondents had a Bachelor's degree. In the age range, 14(26.4%) of the respondents were between the age of 25-34years, 26(49.1%) were between the age of 35-44years, 9(17.0%) were between the age of 45-54years while 4(7.5%) were 55years and above. This implies that the majority of the respondents were within the age range of 35-44 years.

Table 4.2 also showed that 28(52.8%) of the respondents were male while 25(47.2%) were female. This implies that male respondents had the highest number of respondents. In the years of work experience, it was shown that 14(26.4%) of the respondents had 1-5years work experience, 26(49.1%) had 6-10years, 8(15.1%) had 11-15years while 5(9.4%) had 16-20 years of work experience. This implies that the majority of the respondents had 6-10 of work experience. Furthermore, it was shown that 21(39.6%) of the respondents were Assistant Librarian, 12(22.6%) were librarian II, 10(18.9%) were Librarian I, 7(13.2%) were senior Librarian, 1(1.9%) were

Principal Librarian. This implies that the majority of the respondents were assistant librarians. Lastly, it was shown that 17(32.1%) of the respondents were in Cataloguing, 12(22.6%) were in Circulation, 3(5.7%) were in Serials, 6(11.3%) were in Acquisition, 10(18.9%) were in E-library while 5(9.4%) were in Reference. This implies that the majority of the respondents were in the Cataloguing.

4.4 Analyses of Research Questions

Research Question One: What are the types of virtual reality technologies available in selected academic libraries in Kwara State?

Table 4.3: The types of virtual reality technologies available in selected academic libraries.

S/N	Options	Available	Not available
1.	Mixed virtual reality	0(0.0%)	53(100%)
2.	Collaborative virtual reality	0(0.0%)	53(100%)
3.	Fully immersive virtual reality	0(0.0%)	53(100%)
4.	Semi immersive virtual reality	0(0.0%)	53(100%)
5.	Non immersive reality	0(0.0%)	53(100%)

Table 4.3 showed that 53(100%) of the respondents' answers was that virtual reality technology is not available in their library while no respondent said virtual technology is available in their library This means that most of the respondents answer that none of the virtual technologies listed is in their university library.

Research Question Two: What is the perceived usefulness of virtual reality in selected academic libraries in Kwara State?

Table 4.4: The perceived usefulness of virtual reality in selected academic libraries.

S/N	Options	SA	A	D	SD	M	St.D	Over all
1.	I perceive virtual reality technology will allow libraries and librarian create virtual exhibition of content and holdings of the library.	17(32.1)	17(32.1)	9(17.0)	10(18.9)	2.79	1.13	69.8
2.	I perceive Virtual reality will allow users explore digital replica of artifacts, such as rare books, manuscripts and artwork.	19(35.9)	15(28.3)	11(20.8)	8(15.1)	2.81	1.18	70.3
3.	I perceive virtual reality technology will offer innovative ways to enhance media preservation effort in libraries.	14(26.4)	20(37.7)	8(15.1)	10(18.9)	2.77	1.10	69.3
4.	I perceive virtual reality can provide users with immersive and interactive experience of the library.	15(28.3)	18(34.0)	12(22.6)	8(15.1)	2.70	2.70	67.5
5.	Allows engagement with historical cultural media in new compelling ways.	19(35.8)	14(26.4)	13(24.5)	7(13.2)	2.77	1.03	69.3
6.	I perceive it will enhance the accessibility of valuable artifacts while preserving their physical integrity.	20(37.7)	13(24.5)	10(18.9)	10(18.9)	2.70	1.09	67.5
7.	I perceive virtual reality will facilitate appealing virtual content that will encourage library usage.	18(34.0)	16(30.2)	13(24.5	6(11.3)	2.72	1.18	68.0

Table 4.4 revealed that the perceived usefulness of virtual reality in academic library are virtual reality will allow users explore digital replica of artifacts ,such as rare books, manuscripts and artwork ($\bar{x}$ = 2.81, SD = 1.18); I perceive virtual reality technology will allow libraries and librarian create virtual exhibition of content and holdings of the library ($\bar{x}$ = 2.79, SD = 1.13); I

perceived virtual reality technology will offer innovative ways to enhance media preservation effort in libraries ($\bar{x}$ = 2.77, SD = 1.10);and Allows engagement with historical cultural media in new compelling ways ($\bar{x}$ = 2.77, SD = 1.03); among others.

Research Question Three: What are the factors that can prevent the implementation of virtual reality in selected academic libraries in Kwara State?

Table 4.5: The factors that can prevent the implementation of virtual reality in selected academic libraries.

S/N	Options	SA	A	D	SD	M	St.D	Over all
1.	Lack of support from the management of the institution.	17(32.1)	17(32.1)	9(17.0)	10(18.9)	2.79	1.13	69.8
2.	Irregular power supply.	19(35.9)	15(28.3)	11(20.8)	8(15.1)	2.81	1.18	70.3
3.	Inadequate library budget.	20(37.7)	14(26.4	10(18.9)	8(15.1)	2.77	1.10	69.3
4.	Inadequate technical knowledge.	18(34.0)	15(28.3)	12(22.6)	8(15.1)	2.70	1.15	67.5
5.	Inadequate ICT infrastructure.	19(35.8)	14(26.4)	13(24.5)	7(13.2)	2.77	1.03	69.3
6.	Techno phobia.	20(37.7)	13(24.5)	10(18.9)	10(18.9)	2.70	1.09	67.5
7.	Cost of maintenance.	16(30.2)	18(34.0)	13(24.5)	6(11.3)	2.72	1.18	68.0
8.	The complexity of the features of virtual reality technology.	16(30.2)	22(41.5)	9(17.0)	6(11.3)	2.66	0.94	66.5

Table 4.5 revealed that Irregular power supply ($\bar{x}$ = 2.81, SD = 1.18); Lack of support from the management of the institution ($\bar{x}$ = 2.79, SD = 1.13); Inadequate library budget is ($\bar{x}$ = 2.77, SD = 1.10) and Inadequate ICT infrastructure is ($\bar{x}$ = 2.77, SD = 1.03); among others.

4.5 Discussion of Findings

The distribution of participants in the study consists of three major university libraries, which include the University of Ilorin, Kwara State University, Al-Hikmah University. There are more male librarians compared to their female counterparts. The major age range is between 35 and 56 years of age. The designation of the librarians is mostly Librarian II. Most of the respondents had university qualifications in BA, BLIS, and BSC. The majority of the respondents had up to 5 to 27 years of work experience. More than half of the participants worked in the cataloguing section/ unit, but very few worked in the serial Section or unit. Almost all of the participants were aware of the usefulness of virtual reality technology applications in university libraries.

From the findings, it revealed that the respondent's answers to the type of virtual reality technology in their library was that none of the listed virtual reality technology was available it can be observed that a very large percentage of the respondent are knowledgeable of the types of virtual reality technology. As noted by Keane (2019), archives employ the following Virtual Reality technologies: Fully-Immersive, Semi-Immersive, Projected Visions, and Desktop Display. Fully-Immersive VR Technologies would use the same headsets connected to computers that academic libraries would use. However, Chang (2019) explains the only different would that library users would be navigating library stacks to find an answer to a research question. Library users would be able to use the triage reference model and ask reference librarians and library aides who are using virtual reality reference questions and receive answers via virtual reality headsets.

Furthermore, the findings revealed that the respondent's perceived usefulness of virtual reality technology in academic library was that virtual reality will allow users explore digital replica of artifacts ,such as rare books, manuscripts and artwork respondent perceive virtual reality technology will allow libraries and librarian create virtual exhibition of content and holdings of the library, that virtual reality technology will offer innovative ways to enhance media preservation effort in libraries ;and it will allows engagement with historical cultural media in new compelling ways. This is supported by Seymour (2020), who found that in view of expanding potential application of virtual reality, it is incumbent on academic libraries to explore how virtual reality technologies can be used in reference services, archives, and bibliographic instruction. Aside from exploring the potential uses of virtual reality in academic libraries, a metadata study helps to quantify to some extent if the usage of this technology is a paradigm shift or if it just a generally accepted practice.

Lastly, the findings also indicated that the majority of the respondents agreed that some of factors that can prevent the smooth implementation of virtual reality technology in academic libraries are Lack of support from the management of the institution, Irregular power supply, Inadequate library maintenance and the complexity of the features of virtual reality technology budget, Inadequate technical knowledge, Inadequate ICT infrastructure, Cost of maintenance and the complexity of the features of virtual reality technology. Similarly, cost would be a barrier to archives using projected visions because archives cannot have 3d displays for every type of object that they have in their archives which may range from personal papers to corporate objects such as stamps. However, this supports the findings of Cluas (2019), who pointed out that, semi-immersive virtual reality technologies may be impractical for libraries because it would be cost prohibitive for libraries to have virtual reality terminals for each type of historical technology (e.g. horse and

buggy) to the model TA desktop or app virtual reality display may be useful for archives users to learn how a historical even. In navigating library using virtual reality, users may encounter stacks which may be closed due to donor intent, copyright, or clearance requirements. While using a semi-immersive virtual reality experience, library users would be able to use car simulators and flight simulators (non-military) to simulate different scenarios in order to learn how cars have developed over time as well as to develop improved concentration.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the summary of findings, conclusion, and recommendations from the study. The summary is aimed at presenting the discussion of the findings from which the conclusion was drawn. The recommendations are based on the gaps identified in the area of study.

5.2 Summary

In line with the data collected, analyzed, and interpreted, the following findings was obtained:

i. Most of the librarians in the surveyed university libraries in Kwara State, Nigeria, agreed they don't have any of the type of virtual reality technology listed in the research in their university library.

ii. The librarians of the selected university libraries also agreed that they the perceived usefulness of virtual reality in academic libraries will allow users explore digital replica of artifacts, such as rare books, manuscripts and artwork also virtual reality can provide users with immersive and interactive experience of the library, and can allows engagement with historical cultural media in new compelling ways.

iii. Factors that prevent the smooth implementation of virtual reality in academic libraries in Kwara State Nigeria, librarians agreed that Irregular power supply, Inadequate library budget, lack of support from the management of the institution and Inadequate technical knowledge are among those factors that will prevent the smooth implementation of virtual reality technology.

5.3 Conclusion

There is no doubt that virtual reality technology can provide a high-level effective library service. understanding of the perceive usefulness of virtual reality by librarians in academic libraries in the university settings is not simply about the technology itself but how each librarian made a careful and intentional decision on different ways of creating social and educational experience in rendering information services to it clienteles' matter. Although the of virtual reality technology in university libraries is not yet widespread, there is a positive approach towards its full adoption and implementation in university libraries in develop countries. The majority of libraries are now discussing the potential benefits of implementing it in various aspects of the activities that take place in libraries.

Thus, librarians should embrace the benefits that virtual reality has to offer. Implementation of virtual reality technology will improve the efficiency in service delivery, this will allow libraries to continue to be as relevant and effective as they currently are in providing users with accurate information, timely information

5.4 Recommendations

Based on the findings drawn from this study, the researcher has made the following recommendations:

- **i.** The researcher recommends that there should be more awareness of the usefulness of virtual reality technology among librarians.
- **ii.** There should be orientation of the university management by librarians on the usefulness of virtual reality technology in academic libraries.

iii. There should be adequate funding for the university libraries to support the set-up and implementation of virtual reality technology.

iv. There should be intensive training to maximize the skill set of the librarian on virtual reality technology.

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APPENDIX

QUESTIONNAIRE ON:

LIBRARIANS' PERCEPTION ON THE USE OF VIRTUAL REALITY TECHNOLOGY IN SELECTED ACADEMIC LIBRARIES IN KWARA STATE

Dear respondent,

I am a student of the Department of Library and Information Science, Institute of Information and Communication Technology, Kwara State Polytechnic, Ilorin. I am currently undertaking research project titled: **"*Librarians' Perception on the Use of Virtual Reality Technology in Selected Academic Libraries in Kwara State***". I therefore, request you to kindly provide your opinions to the questions as contained in the attached questionnaire. Information provided in this questionnaire will be held confidential and used for research purpose only.

Your quick response will be highly appreciated.

Thanks for your anticipated cooperation.

TOYIN, Mariam Ajoke
Researcher

SECTION A:
Demographic Data

Specify by ticking the right option

Please indicate your university library:

University of Ilorin, Ilorin [ ]

Kwara State University, Malete [ ]

Al-Hikmah University, Ilorin [ ]

Qualification: ND/HND [ ]; BSc/BA/BLIS [ ]; PGD [ ]; MLIS [ ]

Age: 20-34 [ ]; 35-44 [ ]; 45-54 [ ]; 55 years and above

Gender: Male [ ]; Female [ ]

Years of Work Experience: 1-5 [ ]; 6-10 [ ]; 11-15 [ ]; 16-20 [ ]

Professional Status: Assistant Librarian [ ]; Librarian II [ ]; Librarian I [ ]; Senior Librarian [ ]; Principal Librarian [ ]

Section/Unit: Cataloguing [ ]; Circulation [ ]; Serials [ ]; Acquisition [ ]; E-library [ ]; Reference [ ]

SECTION B:

What are the types of virtual reality technologies available in selected academic libraries in Kwara State?

S/N	Options	Available	Not available
1.	Mixed virtual reality		
2.	Collaborative virtual reality		
3.	Fully immersive virtual reality		
4.	Semi immersive virtual reality		
5.	Non immersive reality		

SECTION C:

What is the perceived usefulness of virtual reality in selected academic libraries in Kwara State?

Keys: SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree

S/N	Options	SA	A	D	SD
1.	I perceive virtual reality technology will allow libraries and librarian create virtual exhibition of content and holdings of the library.				
2.	I perceive Virtual reality will allow users explore digital replica of artifacts, such as rare books, manuscripts and artwork.				
3.	I perceive virtual reality technology will offer innovative ways to enhance media preservation effort in libraries.				
4.	I perceive virtual reality can provide users with immersive and interactive experience of the library.				
5.	Allows engagement with historical cultural media in new compelling ways.				
6.	I perceive it will enhance the accessibility of valuable artifacts while preserving their physical integrity.				
7.	I perceive virtual reality will facilitate appealing virtual content that will encourage library usage.				

SECTION D:

What are the factors that can prevent the implementation of virtual reality in selected academic libraries in Kwara State?

Keys: SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree

S/N	Options	SA	A	D	SD
1.	Lack of support from the management of the institution.				
2.	Irregular power supply.				
3.	Inadequate library budget.				
4.	Inadequate technical knowledge.				
5.	Inadequate ICT infrastructure.				
6.	Techno phobia.				
7.	Cost of maintenance.				
8.	The complexity of the features of virtual reality technology.				