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An exploration of the virtual learning environment with reference to the perceived
preparedness of college students in Gaborone

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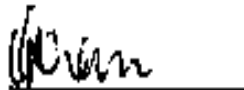**Professor Suresh Shanmugasundaram and Dr Ivy Rose Mathew**

Submission date

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DECLARATION

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I declare that "An exploration of the virtual learning environment with reference to the perceived preparedness of college students in Gaborone" is my work and has not been written for me by any other person(s). The information and work that is not originally mine have been duly acknowledged in the text and provided a complete reference list. Further, no part of this dissertation has been previously presented for another diploma or degree at Botho University or any other institution.

Mrs Nadia Bibi Khan

Date: 28-03-2022

ACKNOWLEDGEMENTS

CERTIFICATION

This is to certify that Nadia Bibi Khan's thesis, titled "An exploration of the virtual learning environment with reference to the perceived preparedness of college students in Gaborone," is a genuine work under our guidance and supervision for the Degree of Master of Education in Higher Education at Botho University.

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Dated: _____

Dated: _____

DEDICATION

Ibrahim Khan, my spouse, is the subject of this research. Omar, Muhammad, Zahra Bibi, Ibraheem, Husnaa Bibi, Zainab Bibi, and Jummah Bibi are the recipients of this research. Your love and support have made this study possible for me, and I want to thank you for your sacrifices to help me achieve my goal.

ABSTRACT

Changes in technology have a significant impact on E-learning in the communication and information systems of the present day. Botswana, like any other country, had a paradigm shift in the teaching and learning process during the Covid phase. This study aimed to determine whether or not students at a few Botswana universities were prepared to utilize the virtual learning environment. This study also aims to observe the progress in using Virtual Learning Environments considering factors such as willingness, attitude, and accessibility, despite the challenges they had to face. It is critical to understand the readiness in several aspects to have seamless learning experiences. The study was conducted using an evaluation questionnaire completed by students. It is found that there is a strong positive correlation between Internet use and virtual learning environments, even though the demographics of the research sample were the same for all participants. The study identified that most students view Virtual Learning Environments as valuable resources despite lack of proficiency in using it.

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CHAPTER 1

STUDY ORIENTATION

1.1.0 General background

During the Covid-19 era, the number of people interested in and working on effective "technology-based solutions" for teaching and learning has increased dramatically (Erhabor, 2021). Due to the pervasive use of Information and Communication Technologies (ICTs) in higher education, the emphasis has shifted from the teacher to the students (Almarzooq, Lopes, & Kochar, 2020). As a result of student requests for more "open and flexible" class schedules, changing socioeconomic conditions, new educational requirements, and the globalization of education, educational institutions have modified their methods of instruction. Virtual Learning Environment (VLE), which was once associated with distance learning, is increasingly being used in traditional "blended" learning (López-Pérez, Pez-López, and Rodrguez-Ariza, 2011).

According to Poon (2019), three significant advantages of VLE are that it makes education and training more accessible, improves the quality of teaching and learning, and gives businesses a competitive edge in a fast-paced market. The use of ICT in higher education has been viewed as a solution to some of the most pressing issues administrators and faculty members face, such as how to improve quality, reduce costs, and make education more accessible. ICT is utilized in higher education through virtual libraries, online training programs, and "learning on demand" (Naaj, Nachouki, & Ankit, 2012). There is a wealth of information in ICT literature on designing and constructing the technological infrastructure required for online learning (Smyth, Down, McInerney, & Hattam, 2019). In addition, the literature on using ICTs in higher education contains a wealth of information that can be used to establish the technical infrastructure required for virtual learning environments (Kwak, Menezes, & Sherwood, 2015). Much has been learned about creating

online courses (King & Arnold, 2012, Lim & Morris, 2019, Ehrlich, McKenney, & Elkbuli, 2020, Almarzooq et al., 2020).

Despite recent interest in modern technologies, particularly the Internet, among the world's higher education institutions, many have been slow to adopt innovative technology for teaching and learning (Thomas, 2020). This is something on which the majority of people agree. From a student's perspective, the problems associated with adopting virtual learning have been examined in depth in the literature review. This study focuses primarily on how students perceive and prepare for VLEs.

1.2.0 Statement of the problem

The Internet could help enhance education, given the various educational levels (Smyth et al., 2019). According to Ehrlich et al. (2020) and McKenney & Elkbuli, (2020), they stated that, even though some claim there will be less opportunity, affordability, convenience, and access for everyone; the majority of people agree that universities, faculty, and students will need to be better prepared for VLE because of:

a) Insufficient expertise and experience with VLE course delivery tools.

b) Absence of a compensation system related to instructional innovation

Multiple researchers have examined virtual learning from students' perspectives similarly (Chen, 2018). According to some academics, maintaining the equipment, software, and internet connection for online courses is time-consuming for students. Web-based distance learning courses could be challenging for students who lack maturity or time management skills (Strunga 2015). Therefore, a lack of trust in technology is a significant reason why virtual learning environments are not as effective as they could be. Gecer and Dag (2012) examined a web-based distance education course from a qualitative case study perspective. Students' upsetting emotions, such as dissatisfaction, fear, and uncertainty, were revealed due to communication and technology issues.

Students' utilization of a Virtual Learning Environment (VLE) is crucial to their productivity (Chen et al., 2018). According to a long history of research on how people accept and use modern technologies, perceived ease of use and usefulness are crucial

factors (Kime, 2013). Studies on how well VLEs (also known as Virtual Learning Environment systems) are accepted by students have demonstrated the significance of these factors (George-Walker & Keeffe, 2010). ICT tools, languages, and protocols are the most significant obstacle for university faculty and students (Smyth et al., 2019). Therefore, the success of any virtual learning environment depends on the faculty and students possessing the appropriate attitudes and skills (Smyth et al., 2019). This theory asserts that doctoral students are more responsible and mature enough to conduct self-study, which is required in most virtual learning environments, and that VLEs are more prevalent at the postgraduate than at the undergraduate level (Chua and Montalbo, 2014).

This study aims to determine whether or not students are prepared to use a VLE. To use the VLE, students must be proficient with computers, have constant internet access, and have the appropriate technology, such as laptops and tablets (Almarzooq et al., 2020). This study will assist the academic community in determining whether students are prepared for online learning and how they feel about it.

1.2.1 Objectives of the study

1. To investigate how well students cope and prepare for a virtual learning environment (VLE)
2. To investigate students' abilities and attitudes to determine whether these may impact students' VLE.
3. To establish the deal between students and the problem of access and lack of infrastructure for VLE.

4. To find out how students who use technology feel about the virtual learning environment.
5. To find out why students reject or accept using VLE for learning.

1.2.2 Hypothesis of the study:

H_{01}: There is a strong association between college students' assessments of the internet's usefulness in academics and the ease with which they can use Internet capabilities.

H_{01a}: There is no significant positive correlation between Internet facilities' availability for college students and their perceptions that the internet is helpful to them in their studies.

H_{02}: VLE engagement correlates well with college students study habits.

H_{02a}: College students' perceptions of VLE interaction are unrelated to their study practices.

H_{03}: According to student surveys, their views on VLE engagement are closely tied to their views on online education.

H_{03a}: Students' impressions of VLE interaction are inversely related to their perceptions of VLE teaching.

H_{04}: Students' impressions of instruction in a virtual learning environment are intimately connected to their interaction experience.

H_{04a}: The impression of teaching is inversely connected to the experience of interaction in a virtual learning setting.

H_{05}: Student attitudes about the ease of using the Internet are significantly tied to the availability of Internet services at their college or university.

H_{05a}: Students' impressions of how easy it is to go online and the availability of Internet services have no association.

1.3.0 Significance of the study

A VLE's educational objective is to disseminate significant academic research and teaching ideas via the Internet's World Wide Web (www). In social psychology and sociology, the

interactive aspect of a virtual learning environment is linked to the concepts of group interaction and social interaction. (Lukman and Krajnc, 2012). This research focuses on how well students are prepared for web-based classes; therefore, it is essential to understand what they believe and how well they can perform these two tasks. As the power of information networks increases, it is anticipated that many students will use online resources to enhance their education (Poon, 2019). As a result of this research, policymakers and educational institutions will better understand the requirements and expectations of VLEs. This study has facilitated students' readiness for a Virtual Learning Environment (VLE). It assists local educational authorities and policymakers in comprehending the significance of VLEs in their respective regions. It helps individuals understand the obstacles that prevent individuals from accepting VLE. This method can also be used to evaluate the acceptance of VLEs.

1.4.0 Scope of the study

a) **Time Scope:** The investigation was conducted between October 2021 and February 2022. This period examined the virtual learning environment that emerged as a pedagogy regarding the perceived readiness of tertiary students in Gaborone. Due to the emergence of the Covid-19 global pandemic, numerous educational advancements occurred at this time. Consequently, it is considered. Even though the internet has been around for a long time, online education has grown in popularity recently (Lim & Morris, 2019).

b) **Geographical Scope:** The data also centered on the primary groups affected by VLEs, including students at both public and private universities in Gaborone. This provided a fuller picture of VLE. This necessitated data from students who had used VLE to study. Since Botswana's VLE is still in its infancy (Jaiyeoba & Iloanya, 2019), it would be difficult to locate information about professors who instruct online courses. Botswana's universities have always been face-to-face institutions (Thomas, 2020). University students in Gaborone could participate in the study because they had recently taken online classes, which were difficult to obtain in the researcher's region.

1.5.0 Delimitations

● The research was conducted at twelve private and public tertiary institutions in Gaborone, a city with many colleges and universities.

● Students in higher education who occasionally or frequently used the internet and computers participated in the study. These students accessed Open Education Resources online via audio and video blogs, wikis, instant messaging, and virtual learning communities of practice.

● The study used primary data to draw conclusions and make recommendations and secondary data for the literature review.

1.6.0 Limitations of the study

• As a full-time worker, the researcher had limited available time for fieldwork. The researcher used Google forms to collect data from various students to overcome this obstacle.

• The researcher knew that the sample size did not adequately represent the entire population. To ensure the accuracy of the study's results, the researcher used tried-and-true methods to determine the sample size.

• Because this study utilized a quantitative research methodology, comparative research may yield different results if a qualitative or mixed-methods research approach is employed as opposed to a quantitative research approach.

1.7.0 Conceptual Framework

The preliminary results will be used to determine whether or not the students are prepared for online learning. Many factors can influence a person's attitude toward virtual learning, including their perception of the utility and usability of modern information and communication technologies (ICTs). Researchers will use the Technology Acceptance Model (TAM) developed by Davis Bagozzi and Warsaw in 1989 to determine why and how some individuals use information systems. This will help them determine what factors may influence how well and how students feel about internet-based learning. According to TAM, external factors influence the perceived usefulness and usability of information

systems, which in turn influences how people feel about using them. In this study, the TAM is utilized to determine whether or not students are prepared for a virtual learning environment. Due to the homogeneity of a small sample size, external factors such as the influence of the local education authority, school or college rules on the use of ICTs, and parental and employer pressure were excluded.

People believe that positive attitudes and plans to participate in virtual learning (highlighted in the dotted area of the diagram below, Figure 1.1) go hand-in-hand because positive attitudes inevitably lead to action plans. This idea is supported by research on how people perceive and prepare for virtual learning environments. Instructional components of virtual learning were created using research-based teaching strategies. Using group interaction and social theories from social psychology, a scale was developed to measure the interactiveness of the virtual learning environment. The study also considered how the students studied and how accessible the internet was to them. The significance of these factors in students' perceptions of virtual learning environments is used to evaluate them. Diagrams illustrate how the model and a research question may be related.
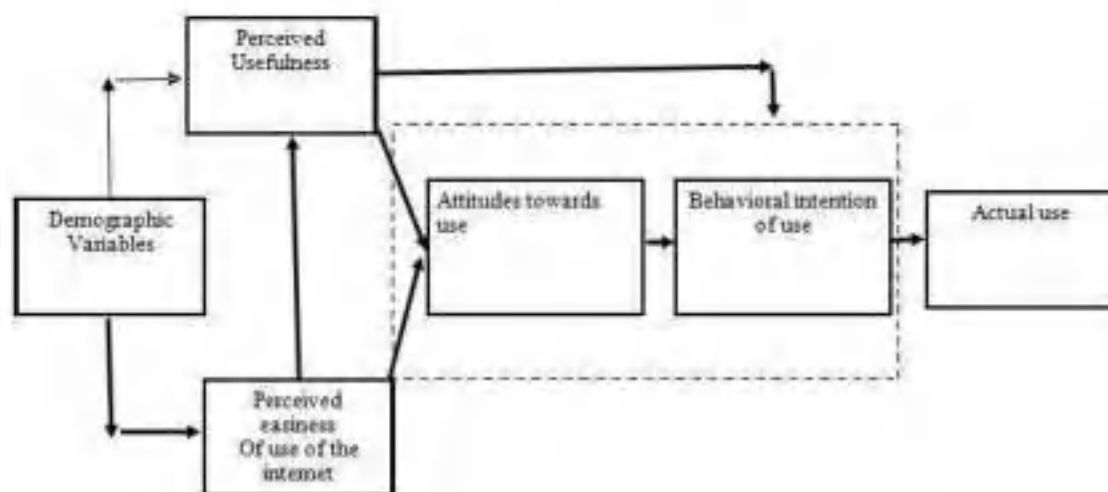
Figure 1. 1 Technology Acceptance Model (TAM) (Ibrahim, 2018:882)

1.8.0 Conclusion

Chapter 1 provides an overview of the study, including its rationale, a description of the problem, the study's objectives, and research questions. It has been demonstrated that online education allows students to learn at their own pace and location of choice. Botswana is still in the infancy of online education. It has only existed for a few years but has expanded rapidly during the most recent Covid-19 period. The most significant issues with online education are that not everyone has access to the internet and that not all students have mobile devices. Starting an online degree program at a college or university will incur additional costs.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter outlines the key concepts that will guide the investigation. Examines the contributions of various authors to the Virtual Learning Environment field. The report begins with a discussion of the evolution of the Virtual Learning Environment and its past. The following section examines the research on changes to the educational system. The final section of the chapter discusses how the authors believe the Virtual Learning Environment has altered college students' perceptions of their preparedness in Gaborone.

2.1 Theoretical background of the study

Two fundamental learning theories are widely used in schools and are the most important and valuable when creating learning models for students in the twenty-first century (Poscente, 2006). Since their discovery, "behaviourism" and "constructivism" have altered educators' teaching methods. Skinner (1948) and Watson (1920) contributed to behaviourism's learning theory. They examined how modifications to the learning environment would impact it. Watson believed that if people were taught to respond to similar stimuli, in the same manner, their behaviour would change to achieve their goals. The results of Pavlov's experiment (Pimentel, 2013), in which he trained a dog to salivate when he rang a bell, also demonstrated his correctness. In 1984, Skinner conducted numerous animal experiments using his famous Skinner box. He trained a rat to pull a lever when it was hungry. He discovered that, depending on their prior experiences, people and animals react similarly to their environments. In 1984, Skinner created a teaching machine based on the learning theory of behaviourism. This was an attempt to provide rote and drill practices in a book and a programmed instruction model via multiple-choice exams. A technology-assisted teaching machine was the first step toward the digital world in which technology-assisted learning is utilized today (Benson, 2015).

With the assistance of the Russian psychologist Lev Vygotsky (Vygotsky) (1987), the French psychologist Jean Piaget developed constructivism in education. Constructivism

asserts that when learning new information, individuals should consider what they already know. They will be better off if they believe their actions before taking action. According to Piaget, it is the responsibility of teachers to offer students opportunities to learn and develop.

According to Vygotsky (1987), the teacher's role should be that of a guide and facilitator. The instructor should encourage students to study, debate, express their opinions, and reach conclusions. He desired that students learn by conversing with their teachers and peers, reading books, and engaging in other educational activities. According to Piaget, the role of the teacher is limited.

The theory of Lev Vygotsky, on the other hand, asserts that the teacher plays a crucial role in teaching through activities in which both the teacher and the students are actively engaged, such as discussions, debates, problem-solving, and collaborative learning. This concept is based on the notion that people learn when working in groups (Vygotsky 1987). Teachers continue to use this concept of face-to-face instruction even in the present day.

Because of these psychological discoveries and efforts, the educational system has changed. Both theories are widely used in education today because they correspond well with how teaching and learning occur. The education system utilizes both face-to-face and technology-assisted learning modes (online learning) based on these ideas (Trudeau & Shephard, 2018). The instructor must choose between the behaviorist and constructivist theories. However, the purpose of teaching and learning will always be to ensure that the student comprehends the material. Both ideas demonstrate that there are two distinct types of teaching responsibilities. However, the student and the teacher must be aware of their duties and do their best to ensure a successful teaching-learning process. Even though both theories have advantages and disadvantages, they will continue to be utilized in everyday teaching and learning to aid in the education of students. Typically, teachers combine these two concepts to achieve their objectives and meet the needs of all students.

2.1.1 Social Cognitive Theory

Social learning is acquiring skills that are developed primarily or predominantly in a social setting, such as a classroom. This research examines how individuals succeed or fail at forming relationships within groups. It also aids in developing emotional and practical skills, self-awareness, and acceptance of others. People gain knowledge from their social surroundings. The social environment of the 21st century is based on the Internet, hence the focus of this study. This concept asserts that individuals can better understand their environment by observing, limiting, and modelling their surroundings. Self-efficacy is based on a person's awareness of the skills they can bring to a social situation. The previous chapter refers to how Self-efficacy is applied in the study (Schunk, 2020).

2.2. Changes in the educational paradigm

Here is a lengthy quotation from Berg and Collins (1995) discussing the shift from "teaching" to "learning" that occurred "in the field."

"Teachers have experimented for a long time with various approaches to combine various learning styles, student-generated knowledge, and the concept of practical learning. Students are no longer viewed as passive recipients of information but as active creators of knowledge with the assistance of their teachers. We can assist with a portion of this instructional oversight by ensuring that students have the resources necessary to conduct their research. Students are encouraged to pursue their passions and engage in education by utilizing new computer-based technology, which could assist them in solving real-world problems."

Computer-mediated communication (CMC) facilitates teaching and learning in numerous ways (UNICEF, 2013). Even if the content and structure of lessons are still a concern, it is important not to hide what students have already learned.

Ogbomo & Ogbomo (2018) It was decided that students should conduct research-like tasks requiring much conversation by investigating how knowledge grows when people collaborate. Machin and Vignoles (2016) were interested in how students form beliefs and

meanings in collaboration. To determine how shared media affects common grounding, they examined a variety of media. Based on Garfinkel's ethnomethodology from 1967 (Mceetya, 2018) examined the relationship between writing and drawing, and speaking. Mceetya is an individual (2018). Virtual learning environments constitute a subset of modern information systems. They are used for computer-assisted training and development in both academic and professional settings. People frequently believe that virtual learning environments are advantageous because they are efficient, individualized, accessible from anywhere, up-to-date, and centered on learning tasks. To obtain these advantages, the system must be well-designed. It is obvious that "specific design attributes" can describe what constitutes an effective virtual learning environment. This information will be helpful in the training and development of professionals. This study examines the design of 75 features of virtual learning environments by conducting a comprehensive literature review. Specific design characteristics of virtual learning environments are requested, presented, and discussed, along with relevant information. Additionally, there are research and practical implications. Because of this, future virtual learning environments may be better designed, utilized, evaluated, and improved over time.

2.3 Change in basic assumptions in the direction of a new pedagogy

A massive student market has developed in the digital age, when students must be more self-reliant. As the number of students and types of students have increased, so have their expectations. The institution will need to evolve to maintain the academic goals that are now at the core of all university courses, regardless of their subject matter (Abdul-Kader, 2018).

People will want to learn about and engage in things in the vanguard. The graduates we seek will require extensive training in advanced technical and professional skills (Guasch, Alvarez, and Espasa, 2010). More verbal and visual than written, media and technology are giving rise to new forms of literacy. This has already made higher education more accessible to more people and spread the concept of lifelong learning on a previously unimaginable scale. Online universities bridge the gap between on-campus and online education: People could learn from an interactive computer network, and simulations could

replace costly and time-consuming trials (Merchant, Goetz, Cifuentes, Keeney-Kennicutt, & Davis, 2014).

In the bright new world of standard packages, transportable modules, and problem-solving rather than knowledge-based curriculum, it will be challenging to preserve the traditional spirit of higher education, as stated by Stonebraker and Hazeltine (2014).

2.3.1 History of technology-based learning

Technological advancement and the emergence of novel social forms have coincided throughout human history. This has prompted people worldwide to develop new methods of living (Chen & He, 2013). The Agrarian and Industrial Revolutions and the development of supercomputers and telecommunications technology had enormous impacts on human history in the past (Chen & He, 2013). The so-called "information and knowledge revolution" of the last decade was the third major shift in human history in the previous three decades (Aduwa-Ogiegbaen & Iyamu, 2018). Digital and communication advancements have significantly altered how things are manufactured, stored, and transported. New digital ICTs designed for the information age or knowledge era have emerged (Dieterle & ClarkeMidura, 2017).

ICTs are superior to older technologies because they enable the use of various media types to create educational apps that are user-friendly, interactive, flexible, and connected (Ebrahim, Ahmed, & Taha, 2019). A single message may contain text, images, audio, and video files. A single package (such as a multimedia set, an audio-video cassette, or a piece of writing) can replace multiple components (such as various media).

In the modern information age, information and knowledge are gaining increasing significance. However, knowledge is defined as data analysis and application, which is the essence of information technologies. It is crucial to have prompt access to information and aid (Follows, 2014).

Information and communication technologies (ICTs) have significantly impacted how businesses operate. However, education does not appear to be immune to significant global changes, especially as the cost of accessing ICT continues to decrease rapidly (FitzPatrick,

2015). As more colleges and universities use ICTs and offer online courses, new and quite distinct options in higher education are opening up, both in terms of cost and method of instruction (Gibbs, 2019).

In the future, new forms of information and communication technology (ICTs) may give students more control over their learning, allowing education to become learner-centered and encouraging the development of higher-order skills such as critical thinking, knowledge construction, and collaborative learning (Mikre, 2011).

Universities began using the Internet around the middle of the 1970s as a supplementary resource. Universities and colleges in the United States have offered online and hybrid courses since 1984, when the New Jersey Institute of Technology began its virtual classroom experiment (Aduwa-Ogiegbaen & Iyamu, 2018). In 1995, however, the Universitat Oberta de Catalunya in Catalonia, Spain, became the first fully online university in the world. Since then, many countries have invested heavily in online education, particularly in North America, Australia, New Zealand, the United Kingdom, and many other European nations such as Norway, Denmark, and the Netherlands. Online courses that combine online and in-person learning may benefit students unable to attend school or college. In addition to what is taught in class, students can access online resources and discussion forums (Kinuthia,2019).

2.4 Virtual Learning Systems

In higher education, virtual learning systems are becoming increasingly prevalent. Students are in a virtual learning environment (VLE) when they interact with their assignments, teachers, and other students using technology (Ligorio & Veen, 2016). "Information technology" refers to computers, communications, and multimedia (Kime, 2013). This study examines "learning by teaching," which occurs when someone attempts to influence how or what another individual learns (Follows, 2014). All students, from elementary school to the end of high school, can benefit from virtual learning systems.

Gibbs (2019) identifies two primary reasons for the rise and spread of VLS:

- Due to the rapid advances in information technology, commercial, scientific, and high-tech professional fields,

- and the increasing demand for education and training, the amount of information available to us is exploding.

The spread of VLS is aided by the rapid development of technology (Virtual Learning Centre, 2020). As a result of high-capacity networks supported by satellite transmission, cellular and radio-frequency communication, and the widespread use of networks and personal computers in homes and businesses, it is less expensive to provide educational services to people in different parts of the world.

The most significant aspects of virtual learning systems are their design and information delivery. Due to the diversity and adaptability of modern information and communication technology, you can design learning so that students are not required to participate or so that they can participate in real time or at their own pace (Chau et al., 2014). Therefore, the design of the virtual environment must be chosen, and these decisions are likely to affect both the amount of knowledge students acquire and the amount of enjoyment they experience. The various types of learning environments are listed in the following table. The spread of VLS is aided by the rapid development of technology (Virtual Learning Centre, 2020). As a result of high-capacity networks supported by satellite transmission, cellular and radio-frequency communication, and the widespread use of networks and personal computers in homes and businesses, it is less expensive to provide educational services to people in different parts of the world.

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Table 2. 1 Attributes of content delivery in the virtual learning environment

Time	Person	Place
Synchronous	Student -student	On-site
Asynchronous	Instruction –Student	Off-site

Adopted from Chua & Montalbo (2014)

2.4.1 Virtual Learning Environment (VLE)

The field of Information Science and Distance Learning has undergone a significant transformation. Online classrooms can use virtual learning environments to incorporate learning resources, assessment tools, and online communication tools (Abdul-Kader, 2018). The virtual learning environment (VLE) is a constantly evolving and expanding location for learning (Aduwa-Ogiegbaen & Iyamu, 2018). As a result, a lifelong learning system must incorporate modern technology, processes, and service methods into the core curriculum. In this situation, we need the concept of a planned learning environment that combines technology and is intended to facilitate student-teacher interaction.

Flexible approaches to teaching and learning refer to educational philosophy and teaching and learning practices (Deggs et al., 2011). (Gregory & Wood, 2020) In education, this term refers to an approach that places greater responsibility for learning on the student and is more learner-centered. When the rules are flexible, students have more freedom to choose what they wish to study and how quickly they want to learn it (Misseyanni et al., 2018). This category of instructional strategies includes learning techniques less dependent on time and place than traditional lessons. Specialized software will assist students, teachers, and administrators create and utilizing courses and reintroducing previously offered courses (Conati, Heffernan, Mitrovic, and Verdejo, 2015). Our world now has a Virtual Learning Environment (Klobuar, Sharples, and Verbert 2016). To create this

environment, high-quality E-learning materials compatible with multiple platforms must be developed.

2.4.2 Virtual Learning Environment in the context of this Study

Because more students are proficient with computers and the Internet, they are more likely to utilize a virtual learning environment while working on projects. Most of Botswana's college students have e-mail addresses and basic computer skills. This study sought to determine how students located educational materials on the Internet. It has been demonstrated that blogs and online study groups assist students with their homework. Some students can use the library to access school-provided online journals and study tools. Internet resources provide students with the materials they need to study frequently. This study examines how students prepare for and perceive the virtual learning environment (VLE).

2.5 Botswana's ICT infrastructure

Botswana's legal and regulatory framework makes it simple and efficient to implement technology in higher education. Advocacy leadership, ICT infrastructure and access, cooperative approaches, money and attitudes, motivation, interactivity, usefulness, and ease of use facilitate technology integration. Everyone contributes to making it happen (Mtebe & Raisamo, 2014). The Ministry of Education and Skill Development (MoESD) allows the government of Botswana to ensure that technology is easily integrated into the educational system. Botswana's historical and economic ties to South Africa's ICT infrastructure could facilitate the country's technology adoption in education (Mtebe & Raisamo, 2014). The most critical policy in Botswana is the National ICT Policy, administered by a steering committee comprised of individuals from various ministries. This committee monitors school e-learning initiatives (Ntshwarang, Malinga, and Losike-Sedimo, 2021). The availability of funds is another crucial factor in Botswana's education system's effective use of technology (Leteane & Moakofhi, 2015). The Ministry of Education and Skills Development assists Botswana's schools with ICT. The government

of Botswana has also partnered with the private sector to ensure that schools have sufficient funds for ICT and technology integration. Since 2005, the government and business sectors of Botswana's education sector have supported incorporating technology. They have accomplished this by implementing numerous pro-technology policies and other measures (Leteane & Moakofhi, 2015).

2.5.1 VLEs used in Botswana

The use of VLE is one of Botswana's most significant technological achievements in higher education (Ntshwarang, Malinga, and Losike-Sedimo, 2021). Educational leaders in Botswana believe that mobile devices such as smartphones, tablets, and laptops can improve the integration of technology in higher education because they are portable and allow users to access technology from any location (Jaiyeoba and Iloanya, 2019). Even though Botswana's economy and infrastructure are problematic, 90 percent of the population is covered by a mobile network, according to surveys. This enables 99.999 percent of the world's population to utilize mobile technology (Asino, 2015). As of January 2021, there are 1.12 million internet users in Botswana. (Ntshwarang, Malinga, and LosikeSedimo, 2021). The Internet users in Botswana increased by 22,000 (+2%) between 2020 and 2021, according to the country's Internet Users Survey. Experts predict that by January 2021, 47.0% of Botswana's population will have internet access. Mobile devices are necessary for Botswana's higher education institutions because they are user-friendly for teachers and students. With these services, you can obtain information based on your location and needs (Fongwa & Wlson-Strydom, 2012). Therefore, students have Internet access to course materials (VLE) through a virtual learning environment. Using computers and mobile devices (tablets, phones, or even game consoles) is acceptable. Educative institutions create virtual learning environments the majority of the time. Schools, colleges, and universities are examples. Then, institutions will choose based on their requirements and their students and employees. Some VLEs are accessible to all students, regardless of where they attend school. Those who wish to take online courses can either pay for them or receive them for free in some instances (Sharples & Roschelle, 2010). VLE is an expansion of e-learning because it addresses the mobility issue (Song, 2014). Botswana schools are equipped with mobile devices for both students and teachers, making the VLE a modern method of education.

Studies in higher education have demonstrated that mobile devices are an excellent tool for facilitating student learning. According to Mafenya (2014), mobile devices can be used to provide on-demand, high-quality, flexible, and interactive higher education. Women professors are more likely to use technology as a teaching tool than their male counterparts. Mtebe and Raisamo (2014) found that mobile devices should play a significant role in the technological integration of higher education institutions. They claim that mobile devices can help students learn subjects more quickly, efficiently, and thoroughly.

The Botswana education system must access funds and other resources to utilize technology effectively. Botswana's Ministry of Education and Skills Development (MESD) has allocated funds to assist schools with ICT (Sharples & Roschelle, 2010). The government of Botswana has also partnered with the private sector to ensure that schools have sufficient funds and support for ICT and technology integration (Thurab-Nkhosi et al., 2005). Botswana's government and private sector have always supported the use of technology in schools. Since 2005, they have accomplished this by passing numerous pro-technology laws and other initiatives. The most significant of Botswana's pro-technology policies is the National ICT Policy Steering Group, which consists of individuals from various ministries who monitor the use of eLearning programs in schools (Leteane & Moakofhi, 2015).

The government of Botswana is aware that the country's education system must be improved through the use of information and communication technology (ICT). As part of the nation's ICT plan, IT programs, initiatives, and apps that help students study and receive assistance should be tailored to the country's educational requirements (Maitlamo 2007). The government established ICT fundamentals courses for high schools and colleges. In government schools, students and teachers have access to computer labs where they can collaborate to learn and improve information and communications technology (ICT). Fifty-seven percent of primary school teachers, according to Leteane and Moakofhi, do not know how to use digital tools to teach or set goals (2015). While 78% know that using technology in education and teaching settings is beneficial, the remaining 22% are not. Regardless, the University of Botswana (UB) is one of three state institutions in Botswana to launch e-learning programs (Qureshi et al., 2012).

2.5.2 The influence of virtual learning environments in Botswana's educational institutions.

The Ministry of Education and Skills Development (MoESD) established Thuto-net as part of the national ICT policy Maitlamo to bring ICTs into the education sector. Even though Botswana has a robust ICT industry, most of the country's educational efforts have been directed toward providing schools and other institutions with computers. But there are grave concerns regarding the lower levels of education because there is insufficient access and not enough people (ETSSP 2015-2020). BUAN University is located in Sebele, on Gaborone's outskirts. It has more than 1,200 students (Moakofhi et al., 2020). Some employees and students at the school live far from campus, but they want to be able to perform their duties when they are not on campus. Most of the time, classes at BUAN are taught in a traditional classroom setting. Using computers, projectors, and interactive whiteboards to teach with ICTs is commonplace. "Student drive" at BUAN is an additional way for students to store study materials such as lecture notes and exam review papers on the university network. All first-year BUAN students are required to take both required ICT courses that teach classroom computer usage. Additionally, there are numerous locations on campus where students can access computers and the Internet.

Higher education institutions such as the University of Botswana benefit significantly from using eLearning technologies because they are more cost-effective than traditional methods of in-person instruction. The most obvious advantage is that teachers and students can access educational materials anywhere at any time (Kattoua et al., 2016). There are numerous e-learning resources from which to choose. Blackboard Learn (BBL) and Moodle are both integral to the learning process at UB. Moodle's business model and social constructivism have made it the industry standard for online education (Costello, 2013). Moodle has many advantages, beginning with the fact that it is accessible to all levels of an institution (Costello, 2013). Moodle and BBL offer blogs, group discussion forums, and email, but BBL is more expensive. Due to the prohibitive costs of using BBL, several colleges and universities have adopted Moodle for all faculties and departments. Since its introduction at the University of Botswana (UB), eLearning has grown in popularity, but many faculty and staff members have yet to adopt it fully. Due to the shutdown of COVID-

19, eLearning at UB was deemed valuable, significant, and beneficial. Due to this, the school required remote workers to assist with both teaching and school administration (both on and off campus). All tasks for the day were completed with the proper equipment. Botho University's online distance learning programs have utilized Blackboard, a highly innovative mobile learning platform (2022). Students and faculty at Botho University have been using Blackboard Learn and the mobile app as part of a "blended learning" strategy. People enrolled in conventional educational programs are also included (a combination of classroom and online learning).

Students at Botho University have access to Blackboard Learn (VLE), a virtual campus that instructors and students can use at any time. Students can access Blackboard on their mobile devices via the Blackboard App and the Blackboard Instructor App. Blackboard provides access to online learning tools and activities. Content management systems enable educators to share various multimedia resources with students. This is just one of the many capabilities of these systems. There are also plagiarism detection and reporting tools that make it simple to identify students who are in danger. BU uses "Turnitin," the industry standard for detecting plagiarism, as part of its evaluation process. Blackboard's e-Library features are also easy to use.

2.5.2 Students' perceptions of VLEs as users in different Botswana institutional contexts using mobile devices

The four types of VLE challenges are resources, equity, epistemological, and institutional (Kaliisa & Picard, 2019). Despite widespread use in higher education, mobile devices (m-devices) remain a source of contention. Asino (2015) discovered that institutions, including those in Botswana, do not offer the same level of technical support for mobile devices as desktop computers. This could impact how students and faculty utilize mobile devices. If a student or staff member needs assistance with their mobile device to access educational materials, they may not receive it. Institutions of higher education frequently believe that m-devices inhibit classroom learning because students may spend most of their time in class engaging in social activities rather than studying. This has a significant impact on the integration of technology.

2.6 Chapter Summary

As a result of a comprehensive literature review, this chapter examined VLE in higher education from various perspectives. It also examined the effects of technology on college students, the pressure on colleges and universities to utilize modern technology and the advantages of technology as a tool for enhancing learning. The potential of technology as a research tool and catalyst for the long-awaited educational revolution in higher education was also discussed.

Finally, the debates surrounding technology in higher education are discussed. A study on the impact of ICT on education revealed that, when used appropriately, technology can help students learn more quickly. The article's final section examined how college students evaluate using a virtual learning environment (VLE). The VLE's strength derives from its theoretical perspectives on general and developed theories but lacks a pedagogical component. After reviewing the literature, it was determined that using a virtual learning environment (VLE) may effectively enhance collaboration and student engagement in Botswana's institutions' learning and teaching cultures. In the following chapter, we will go into greater detail.

CHAPTER 3
RESEARCH METHODOLOGY

3.0 Introduction

In the previous chapter, pertinent literature was reviewed. This chapter describes how this study was conducted. The provided information is explained in detail here. Mixed primary and secondary materials were used to construct the structure. This chapter describes the tools and equipment utilized in this investigation. This chapter discusses the population sample, sample size, and sampling procedure (s). This chapter comprehensively explains the terminology required for study research methods. This chapter also describes the methods used to analyze the data for this study.

3.1   The research design

Due to the increasing popularity of online learning, the primary objective of this study is to determine how prepared students are for a virtual learning environment. According to the TAM, numerous factors can influence how students apply their skills and perceive technology-assisted education. Information system research can determine whether or not students are prepared for virtual learning and their level of knowledge.

The TAM is the best method for determining whether students are prepared for a virtual learning environment in this study. In such an environment, teachers and tertiary students have no control over factors such as the operation of the local educational authority, the standards of the national accreditation board, the institution's rules regarding the use of ICT, parental pressure, and curriculum demand. Also, how valuable a computer is perceived and simple are two of the most influential attitudes in predicting future behaviour and participation in a virtual learning environment (Turner, 2010).

In their article, Pannucci and Wilkins (2010) discuss three aspects of a virtual learning environment: education research, theories about how the media influences individuals from communication research, and group interaction and social theories from psychology and sociology. This study focuses on the game's educational and entertaining qualities. The

teaching portion of a virtual learning environment occurs when educational content and tools are made accessible via the Internet. Utilizing forums, chat rooms, and other online tools for communication, students in virtual learning environments can engage in collaborative (group) learning activities such as case studies and group discussions. It is also a great way to discuss problems with teachers and students and clarify advice. The concepts from social psychology and sociology regarding how individuals and groups interact are helpful for the interactive elements. There are two ways to determine how well-prepared children are: examining their attitudes and abilities in these two areas. Everyone agrees that students' attitudes and preparation are crucial to their success in virtual learning environments and that these two factors are interrelated.

3.2 The Quantitative Method

In the quantitative research method, numerical data are collected and analyzed (Tavallaei & Talib, 2010). Due to how the research was conducted, the data were presented as statistics. A researcher develops a theory and sets up equipment to collect data to test it as part of hypothesis testing (Jeanfreau & Jack, 2010). The researcher utilized the quantitative method because it facilitated the examination of voluminous data. Quantitative methods were also employed because they are quick, unbiased, and compatible with large models. The primary issues with questionnaires are that they are rigid and cannot control the number of responses. Quantitative methods gather data to prove or disprove a hypothesis once the researcher has identified the problem and developed a theory.

A crucial aspect of this study was using a structured questionnaire as a quantitative research instrument and a standardization instrument to ensure that the responses met current standards. Respondents were asked the same set of questions in the same order to ensure the accuracy of the data collected. These results aid in determining the extent of variation and the causal relationships between the numerous variables examined. Denzin and Lincoln have stated that quantitative researchers are primarily interested in identifying causal relationships between variables (Wisdom, Cavaleri, Onwuegbuzie, & Green, 2012). Graphs and tables were utilized to display quantitative data and provide context. Statistics were used to demonstrate the findings. A quantitative study was used to determine the characteristics of the population. The researcher knew she had no control over the number

of respondents to her questionnaires. This research method is highly reliable, even though subjective opinions are not permitted to influence the data collection process. According to Voils et al., quantitative data differs from qualitative data due to this one factor (2008). This study was conducted through interviews with college students who used the Internet for schoolwork. A social survey was the best method for determining how well the TAM model works for VLE. Based on past research on VLEs, other exploratory factors such as study habits and Internet access have been operationalized.

3.2.1 Survey Method

In this study, a survey research method was used. The acceptance of VLEs has been examined in a controlled environment with a small number of individuals. Most of those who responded to this survey were degree-seeking full-time students at one of Gaborone's universities. There were two types of colleges: profitable and unprofitable. There is a mixture of self-funded colleges and government-funded colleges in Gaborone. This classification considers that each institution has a unique student body and facilities. The study participants were divided into supported and self-financing students based on their field of study and financial situation. Numerous areas were considered, including the arts, engineering, business, medicine, and Para medicine. After being divided into groups, the students were given questionnaires. The study participants ranged from recent college graduates to those still in graduate school.

This study aimed to determine how college students viewed virtual learning environments. Utilizing a survey and random sampling, information for the analysis was gathered.

3.3 Research instruments

The below-described structured questionnaire was used as the study's research instrument after prior discussion.

3.3.1 The structured questionnaire / Google forms

The survey responses were organized so the analysis could be conducted more quickly and with more data. Due to the global spread of Covid-19, the researcher created a Google form to collect data without meeting with each respondent in person. Using Google forms also provided the researcher multiple ways to analyze the responses. The Google form contained closed-ended questions to facilitate faster and more accurate data processing. Because each respondent was asked the same questions, analysing the data was much more straightforward. The questionnaire was written in simple language (determined by a pre-test). The clarity of the questions was one of the most important factors to consider when creating the questionnaire. There were clear instructions on how to respond to the questions for those with varying levels of English. The length of the questionnaire was kept to a minimum so as not to annoy respondents, but it was long enough to ensure that no essential data was overlooked. One school in Gaborone sent Google Forms questionnaires via email to students. To encourage more people to respond, the non-responders were investigated.

Much effort was put into making the instrument clear and easy to read. The survey included as many distinct options as possible. The questions were formulated logically so that individuals would respond. In the survey, there were no questions about using any of the numerous available devices (Ntshwarang et al., 2021). In addition to the traditional TAM, a virtual learning environment's teaching and interacting components were investigated. Each participant was administered identical items at different times to eliminate systematic response bias. Actual users and information systems professionals conducted the pre-testing and pilot testing. In addition to experts in information systems, the panel included experts in diverse study methods.

3.4.0 Sampling Issues

3.4.1 Population

A population is the number of individuals that Curry, Nembhard, and Bradley examined for their study (2009). According to Richard, target and research populations can be distinguished (2013). College students from Gaborone who regularly used computers and

the internet participated in this study. They were college students who utilized computers and the Internet frequently. These students used Open Education Resources online, such as audio and video blogs, wikis, instant messaging, and various virtual learning communities. Since these students were randomly selected from Botswana's capital city's colleges, their responses were likely influenced by factors over which they had no control. Students in their first and second years of college were asked their opinions on online learning environments to determine if their educational level made a difference. Several factors were considered to determine whether or not a student's preparation for a particular field of study was discipline-specific. In contrast, local education authorities, national boards of education, institutional policies, parents, and employers were not evaluated because the sample was homogeneous and comprised only college and university students in these locations.

3.4.2 The Sample

A visible sample of a population is considered to be representative. According to Miles and Wayne (2017), a sample is a small portion of the entire population that is being studied. The primary reason we examine a sample instead of the whole population is that it would be too costly to collect complete data on the entire population. Focusing on population subsets may be the most effective way to achieve desired outcomes. According to Bryman (2007), sampling is the process of selecting a few individuals (samples) from a larger group (sample population) to estimate or forecast a fact, condition, or outcome for the larger group.

3.5.0 Judgement and purposive sampling

Twelve were randomly selected from a list of 34 colleges in Gaborone, Botswana. Because of their location and Internet connectivity, these schools were chosen. Three hundred seventy-seven of the school's 18784 students were selected for this study. The questionnaires made use of a sampling technique known as "judgmental sampling," also known as "purposeful sampling," because the respondents were believed to be moderate to heavy Internet users. The researcher's evaluation was the only factor that determined the sample's representativeness. The judge sample is also not random because not every

member of the population has an equal chance of selection. Changes to the judgment sampling method may be a good idea in certain circumstances. In these circumstances, "purposeful sampling" is the term used to describe what occurs. As the term "sample" implies, the individuals in the sample are selected from the population for a specific purpose. In this sampling strategy, sample parts were chosen because they were believed to be representative of the target population and to contribute to the study's objectives.

Table 3. 1 Population

No.	Institution	Branches Botswana	Departments Faculties	number of lectures	e Student population
1	Gaborone Institute of Professional Studies	3	5	30	1200
2	Ba Isago university college	2	5	N/S	1872
3	Limkokwing university	1	3	15	1500
4	ABM University College	2	3	10	469
5	Botswana Accountancy College	2	6	60	2145
6	Botho University	2	4	N/S	1633
7	Imperial School of Business & Science	1	3	N/S	325
8	New Era	1	3	20	785
9	Boitekanelo College	2	4	Not Specified	2600
10	Kgolaganyo College of Theology	1	2	10	230

11	Institute of Development and Management	2	3	N/S	2456
12	University of Botswana	2	8	N/S	4569
	Total population				**18784**

Table 3. 2 Rao soft Sample Size Calculator

Confidence level	95%
Margin of Error	5%
Population Proportion	50%
Population Size	18784
Sample Size: 377	
is means that at least 377 measurements or surveys are needed to be 95 percent sure that the real value within +5% of the value measured or surveyed.	

3.6.0 Key Data sources

Internet, journals, textbooks, newspapers, television, YouTube, newspaper archives, and government documents were all vital resources for gathering information about virtual learning in Botswana and contributing to the development of literature.

3.7.0 Data Collection methods.

The majority of the information for this study came from a questionnaire created using Google forms. Individuals who agreed to participate were given a consent letter or document to read and sign. This letter was included with a questionnaire used to assess the virtual learning environment based on how well college students in Gaborone believed they were prepared (the instrument is described above) (see also Appendix 1). This was completed after receiving permission from the appropriate parties to conduct research. The participants were sent a Google forms-based attitude survey to complete.

3.7.1 Primary Data collection

"Primary data" refers to information gathered solely to solve a problem (Castellan, 2010). A significant portion of the research involved collecting first-hand accounts. This study was conducted through a questionnaire survey.

3.7.2 Pilot study

At a private college, 50 individuals from various fields evaluated the survey instrument. According to those who responded, the questions were unambiguous and left no room for misunderstanding. In response to their feedback, certain modifications were made to the original design. For instance, the questionnaire was divided into multiple sections to facilitate completion. People who completed it thought it was too lengthy, so it was shortened. The final study was conducted based on the results of questionnaire pilot tests.

3.8.0 Data Analysis and interpretation

This study used simple descriptive statistics and IBM SPSS 26 to analyze the research data. Information from 300 individuals was encoded and entered into IBM SPSS 26 for statistical analysis (Appendix 5). A neutral volunteer keyed in the data so the codes could be compared to the original questionnaire for errors and connections. Using statistics, we examined and explained the data in three distinct areas. In the first part of the descriptive study, demographic data were subjected to frequency analysis. The study's second objective was to compare the significance of demographic factors to the study's theoretical framework, which consisted of the TAM dimensions. The reliability of measurement is the absence of random errors. Cronbach's Alpha is frequently used to determine the reliability of a multiple-question test. It was utilized in this study, and 0.7 was deemed an excellent value.

3.9.0 Ethical Considerations

Botho University's Ethical Committee gave its approval (Appendix 4). Before participating in the study, all participants were informed of its purpose and expectations. Before the

investigation could begin, they were also required to sign a form (Appendix 1). This was done to conceal the research's findings.

As stated in section 3.3.1, a global Covid-19 pandemic exists; therefore, the researcher created a Google form to collect data due to Covid-19 protocols. For faster and more accurate data analysis, most survey/Google form questions were closed-ended (Appendix 2).

This investigation adhered to six (6) fundamental ethical principles:

- **Informed consent.** Once the respondents knew what the study was meant to do, they gave their permission.

- **Confidentiality and anonymity.** Before filling out the questionnaires, the people who participated in the study were told that their personal information would not be included in the study report. They were told that they did not have to fill out the questionnaire, nor were they forced to. No one was forced to take part in the study.
- **Right of privacy.** Respondents' privacy was protected because they did not have to put their names on the questionnaire. An informed consent form was also included to protect respondents' privacy.
- **Involvement of the researcher.** The researcher tried not to change respondents or treat them like things or statistics instead of unique people.
- A research permit was asked for from the Ministry of Tertiary Education (see Appendix 3), and it was granted.
- **Withdrawal from participation is a legal right:** Respondents were also told that they could drop out of the study at any time without getting in trouble. From the start, all the respondents were told that there were no incentives or cash rewards.
- The study was also sent to the university's research ethics board, which approved it (see Appendix 4).

3.10.0 Limitation of the method

Certain things were not possible with the research study. First, the sample size for the type of multivariate analysis used to evaluate TAM was inadequate. Therefore, the study was divided into smaller models, and a route diagram was created to determine how independent variables were affected by factors that were not dependent on them. Given that the research was primarily viewed as exploratory, this appeared to be a wise decision. Students from distant schools who enrolled in online classes could have been evaluated. However, the researcher lacked the resources to conduct such a comprehensive survey.

3.11.0 Chapter Summary

This section's primary objective was to describe how and why the study was conducted. The proper individuals permitted research to be undertaken. Planned using a combination of exploratory, descriptive, and interview research. For the analysis, questionnaires were used to collect information. The subsequent chapter discussed the findings of the study.

CHAPTER 4

ANALYSIS AND INTERPRETATIONS OF DATA

4.0 Introduction

A descriptive analysis was conducted in the first section using a frequency analysis of demographic variables. This analysis was divided into three groups and conducted using distinct statistical techniques. Second, we looked for statistical differences between the demographic data and the study's theoretical framework, as demonstrated by the TAM dimensions. A t-test was used to determine the significance of this study. Chi-square tests are used to examine the relationship between ICT usage and demographics. TAM employs correlation analysis to determine if the relationship between the independent and dependent variables is meaningful. Following the Multiple Regression Analysis, an Index of Tables was used in the Analysis of Conceptual Framework Variables.

Table 4. 1 College Students by Gender Frequency Distribution

SEX	FREQUENCY	%
Male	191	59.87
Female	128	40.13
Total	319	100

The majority of participants in this study were male, while the remainder were female. As shown in the table above, there are more men than women among these students. From this perspective, female students are less likely to use the internet than male students.

Table 4. 2 By Age Group, the Frequency Distribution of Students in College.

AGE GROUP	FREQUENCY	%
<=18	46	14.42
19-20	118	36.99
21-23	129	40.44
>23	26	8.15
TOTAL	319	100

There are numerous college students aged 19 to 30 in Gaborone. In addition, most college students are between the ages of 18 and 20.

Table 4. 3 College students' monthly family income distribution frequency

INCOME	FREQUENCY	%
<=10000	75	23.51
10001 - 20000	114	35.74
20001 - 30000	65	20.38
>30000	65	20.38
Total	319	100

According to the findings of this study, college is only attainable for individuals whose families earn between P10,000 and P30,000 per month. To attend college, a student's household income must be at least P10,000 per month.

Table 4. 4 Distribution of College Students' Levels of Study

Level of Study	Frequency	Percentage
UG	182	57.05
PG	137	42.95
Total	319	100

As shown in the table, more than 57 percent of college students use virtual learning environments (VLEs) to further their education. The participation rate of graduate students in this study is 42.95 percent.

Table 4. 5 Frequency Distribution by College Students' Disciplines of Study

Discipline of Study	Frequency	Percentage
Science	72	22.57
Engineering	66	20.69
Medicine	51	15.99
Paramedical	39	12.23
Commerce	35	10.97
Humanities	56	17.55
Total	319	100

This table depicts the proportion of college students in the sample from various academic fields. This survey was completed by students in the sciences (22.57 percent), engineering (20.69 percent), and humanities (17.55 percent). This research also included medical students (15.99 percent). Commerce and paramedical students participated as well.

Table 4. 6 Students' Internet Use Frequency Distribution by Year of College Attendance

Years of Using the interne	Frequency	%Age
Not used	40	12.54
< 1 year	46	14.42
1-2years	63	19.75
2-3years	61	19.12
<3 years	109	34.17
Total	319	100

More than 86 % of college students had been online for more than a year at the time of the survey. More than one-third of the college students surveyed had spent at least three years online. Only 13% of college students had never used the Internet.

Table 4. 7 How Often Do College Students Turn to the Internet for Schoolwork?

Internet Use in Academic Settings	Frequency	Percentage
Yes	279	87.46
No	40	12.54
Total	319	100

Over 86 percent of students have used the internet for more than a year, with the majority using it for academic purposes. The majority of students use the internet extensively to enhance their education.

Table 4. 8 Based on how they use modern information and communication technologies, the frequency distribution of college students is shown.

	Yes	
	Count	%
Not Used	6	1.88
Telephone	113	34.42
Cell phone	250	78.36
Computer	245	76.80

The most common ICTs owned by college students are mobiles and laptops, but only 43 percent of students with computers have internet access, and only a handful have never used it. This indicates that, on average, 75 percent of students use mobile phones and laptops as ICTs.

Table 4. 9 New Information and Communication Technology (ICT)-enabled distribution of college students

	Yes	
	Count	%
Not Used	2	.62
Telephone	133	41.69
Cell phone	299	93.73
Computer	273	85.57
Internet	252	78.99
Fax	44	13.79

College students frequently access new information and communication via their mobile devices. This is followed by computers, which have a reading rate of over 85 %, and the internet, which have a reading rate of 78.99 %. Figure 4.8 depicts the variety of people who own and utilize mobile devices, computers, and the Internet.

Table 4. 10 The use of online resources to distribute the number of college students

	Yes	
	Count	Frequency
Internet Resources	251	78.68
E-mail Chat	197	61.76
Entertainment	111	34.80
Internet Resources	182	57.05
News Update	82	25.71
Education Sites	56	17.55
Job or Business Opportunities	45	25.71
Travel and tourism	36	
Health Care	3	14.11
Web Shopping	56	11.29
Nil		.94

This survey found that email and chat are the most widespread internet use (61.76 %). The majority of students (17.55%) use the Internet to search for educational information, followed by news updates (25.71%) and employment or business opportunities (25.71%).

Numerous college students use the Internet for amusement (34.80 %). According to the findings, more than half of all college students use educational websites frequently. This is demonstrated in Table 4.10.

	Blogs	79.31
2	Wikipedia	77.43
3	Instant Messages	70.22
4	You-Tube	62.97
5	Virtual Learning Communities	54.55
6	Digital Library	52.35
7	My- Space	47.34

0		1		2		3		4		5		6		7	
count	%	Count	%	Count	%	Count	%	coun	%	Count	%	count	%	coun	%
66	20.69	101	31.6	41	12.8	44	13.79	21	6.58	15	4.70	17	5.33	14	4.39
72	22.57	73	22.8	87	27.2	18	5.64	30	9.40	16	5.02	9	2.82	14	4.19
95	29.78	31	9.72	51	15.9	56	17.55	29	9.09	22	6.90	26	8.15	9	2.82
145	45.45	16	5.02	22	6.90	18	5.64	31	9.72	28	8.78	25	7.84	34	10.66
121	37.93	39	12.2	44	13.7	48	15.05	24	7.52	19	5.96	12	3.76	12	3.76
168	52.66	7	2.19	22	6.90	16	5.02	23	7.21	18	5.64	34	10.66	31	9.72
152	47.65	26	8.15	12	3.76	36	11.29	16	5.02	33	10.3	19	5.96	25	7.84

According to the study, more than half of college students are familiar with free educational resources and regularly utilize the Internet for schoolwork. Blogs and Wikipedia are the most popular learning resources among students. Blogs were the most popular among college students, followed by Wikipedia, instant messaging, YouTube, virtual learning communities of practice, digital learning in general, and Myspace, in that order.

Table 4. 11 Personal Usage of Computer

Usage	Frequency	Percentage
Not used	27	8.46
Everyday	160	50.16
3-5 times/week	48	15.05
1-3 times/week	84	26.33
Total	319	100.00

In addition, fifty percent of students use computers daily, while the remaining 49.84 percent use computers less frequently.

Table 4. 12 Personal Usage of Computer by hours

Usage	Frequency	Percentage
Not used	28	8.78
3-5 hours	160	50.16
1-3 hours	48	15.05
0.30-1 hours	84	26.33
<30 min	78	15.05

Students spend an average of 3.5 hours per week on the Internet, and 26.33 percent use their computers for less than one hour daily. The data indicate that only 8.78 percent of students lack access to a computer.

Table 4. 13 Computer Use in Academic Settings

Usage	Frequency	Percentage
Not used	41	12.85
Everyday	155	48.59
3-5 times/week	32	10.03
1-3 times/week	91	28.53

Most college students use computers daily (48.59 percent), followed by 10.03 percent who do so between three and five times per week, 28.53 percent who do so between one and three times per week, and 12.85percent who do not.

Table 4. 14 Computer Time Spent in College, Broken Down by Week

Usage	Frequency	Percentage
Not used	40	12.85
3-5 hours	33	10.34
1 - 3 hours	86	26.96
0.30-1 hours	92	28.84
<30 mini hours	68	21.32
Total	319	100.00

Based on the number of hours they spend on computers each week; 12.83 percent of students report not using them for school-related purposes. Most students use computers for less than 30 minutes per week, and only 10.5percent use them for 3–5 hours per week or more.

Table 4. 15 Internet use for one's purposes

Usage	Frequency	Percentage
Not used	30	9.40
Everyday	123	38.56
3–5 times/week	55	17.24
1-3 times/week	111	34.80
Total	319	100.00

Only 9.4 percent of students do not use the Internet, while 38.6 percent use it daily, 17.2 percent use it 3–5 times per week, and 34.80 percent use it 1–3 times per week.

Table 4. 16 Hours spent using the Internet for academic purposes.

Usage	Frequency	Percentage
Not used	32	10.03
3-5 hours	43	13.48
1 – 3 hours	109	34.17
0.30-1 hours	89	27.90
<30 mini hours	46	14.42
Total	319	100.00

Students who use the internet for academic purposes 1-3 hours per week (34.17 percent) and less than an hour (27.90 percent) are in the minority; 13.48 percent of college students report using it for longer than that. 14.42 percent of students use the Internet for academic purposes every week.

Table 4. 17 Using ICTs for Learning as a Whole

Overall Usage of ICTs	Frequency	Percentage
Low	90	28.21
Average	147	46.08
High	82	25.71
Total	319	100

As can be seen, the average number of computer and Internet users is approximately 46.08 percent. Only 25.71 percent of the population are heavy users of computers and Internet users, while 28.21 percent are light users (computers and the Internet).

Table 4. 18 T-test for statistically significant differences in the parameters of TAM across genders

Dimensions of TAM	Male		Female		T-Value	P value
	Mean	SD	Mean	SD		
Perceived Usefulness of Internet	67.92	10.75	67.21	9.21	0.61	0.541
Perceived Easiness of using Internet	34.73	4.82	35.01	4.60	0.51	0.611
Perception of IT in virtual learning	18.59	3.56	19.05	3.23	1.19	0.233
Perception of Interactive learning	39.41	6.09	39.26	6.83	0.21	0.831
Availability of Internet facilities	21.18	4.33	22.52	4.04	2.77	0.006**
Study Habits	54.83	9.50	54.77	9.41	0.05	0.956
Note ** denotes significance at 1% Level *represents significance at 5% level						

There are significant gender differences in how students feel about using VLEs, as shown in the table above (p-value less than .001). There are no significant gender differences in TAM characteristics such as Perceived Ease of Use and Perceived Ease of Using the Internet.

Table 4. 19 Other TAM factors, such as gender

	Age group in years				T-Value	P value
Dimensions of TAM	<=18	19-20	21-23	>23		
Perceived Usefulness of Internet	65.59	67.09	68.61	68.88	1.269	0.285
Perceived Easiness of using Internet	35.07	35.06	34.55	34.92	0.282	0.838
Perception of IT in virtual learning	18.96	19.12	18.11	20.19	3.616	0.013**
Perception of Interactive learning	39.65	38.86	39.28	41.38	1.148	0.329
Availability of Internet facilities	22.26	22.03	21.39	21.00	0.959	0.412
Study Habits	53.57	54.88	54.99	55.77	0.371	0.773
Note ** denotes significance at 1% Level *indicates significance at 5% level						

A statistically significant difference exists between groups when the P-value is less than 0.05. Other TAM factors have nothing to do with the age of college students.

Table 4. 20 Chi-squared analysis of the relationship between the use of ICTs in higher education and the gender of the students

Gender	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
Male	59	75	57	191		
Female	31	72	25	128		
Total	90	147	82	319	9.17603	0.01**

Students of both genders are more likely to use ICTs for academic purposes, and the p-value for this association is less than 0.01. Students of both genders are more likely to use ICTs for educational purposes, and the p-value for this association is less than 0.01.

Table 4. 21 Chi-square test to see if there is a link between how old college students are and how much they use ICTs for education.

Age	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
<=18	19	20	7	46		
19-20	36	58	24	118		
21-23	27	61	41	129	12.788	0.046*
>23	8	8	10	26		
Total	90	147	82	319		

P-values less than 0.05 indicate a correlation between the age of college students and how they utilize ICTs to learn.

Table 4. 22 An analysis of the relationship between college students' monthly family income and their total use of information and communications technology

Income	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
<= 10,000	36	32	7	75		
10,001 -20000	24	60	30	114		
20001-30000	13	33	19	65	31.122	0.000**
>30000	17	22	26	65		
Total	90	147	82	319		

As indicated by a P-value of less than 0.001, there is a correlation between college students' age and general use of ICTs for Learning.

Table 4. 23 College students' academic level is correlated with their total ICT use, according to a Chi-square test.

Level Of Study	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
UG	59	80	43	182		
PG	31	67	39	137		
Total	90	147	82	319	3.7821	0.15083

P-values greater than 0.05 indicate no correlation between the academic level and college students' full use of ICTs for learning.

Table 4. 24 Chi-Square test correlating the major of college students with their overall usage of ICT

Discipline	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
Science	8	42	22	72		
Engineering	3	32	31	66		
Medicine	23	18	10	51	87.542	0.000**
Paramedical	11	17	11	39		
Commerce	8	21	6	35		
Humanities	37	17	2	56		
Total	90	147	82	319		

The P-value for using ICTs for learning by students in various academic disciplines was less than 0.01.

Table 4. 25 Due to the low P-value, there is a connection between students' academic disciplines and their total use of ICTs for learning.

Usage	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
Not Used	28	12		40		
<1	13	18	15	46		
1-2	12	31	20	63	48.19	0.000**
2-3	15	34	12	61		
>3	22	52	35	109		
Total	90	147	82	319		

As the P-value is less than 0.01, there is a correlation between the number of years' college students spend on the Internet and their use of ICTs for learning.

Table 4. 26 Evaluating using a Chi-Square test the relationship between Internet users and non-users for academic purposes, as well as the widespread use of ICT for education

Usage	Overall usage of ICTs			Total	Chi Square	P-Value
	Low	Average	High			
Yes	62	135	82	279		
No	28	12	00	40		
Total	90	147	82	319	42.62864	0.0000

P-values less than 0.01 indicate a relationship between Internet use and general educational ICT use.

4.1 Data Regression Analysis for Hypothesis Measuring

H_{01}: College students who have access to Internet services are likelier to believe that the internet is helpful to them in their academic pursuits.

H_{01a}: For college students, there is no substantial correlation between the availability of Internet services and their opinions that the Internet is beneficial to their academic endeavours.

Table 4. 27 Regression Analysis

Dependent Variable	Independent Variable	R	R(2)	Standard Error Beta	Beta	T	Sig.T
Availability of Internet facilities		0.55	0.29	3.58			
	Constant			2.03		1.629	0.10
	PU of Internet			0.02	0.06	-1.133	0.25

Since Beta is 2.03 and Sig is 10, the table above shows that the t value is -1.13. Hypothesis H01 may be accepted, and null hypothesis H01a may be rejected since the p-value is more than.05.

H02: Studies have shown that how students approach VLE engagement significantly impacts their academic performance.

H_{02a}: Academic performance of college students does not correlate with their opinions about virtual learning environments (VLEs).

Table 4. 28 Regression Analysis

Dependent Variable	Independent Variable	R	R(2)	Standard Error Beta	Beta	T	Sig.T
P of Interactivity		.71327	.49607	4.53368			
	Constant			2.561103		2.041	.0421
	Study Habits			.050395	.18	3.70	.000**

At.0000 (t value=2.904), the standard Beta is 18, with a Sig at.0000 of 18. To put it simply, the p-value is smaller than.05. we may accept hypothesis H02 and reject null hypothesis H02a.

H03: Students' impressions of interaction in the VLE and their perceptions of teaching in the VLE are strongly linked.

H03a: Student impressions of interaction in VLE and their perceptions of teaching in VLE have no significant correlation.

Table 4. 29 Regression Analysis

Dependent Variable	Independent Variable	R	R(2)	Standard Error Beta	Beta	T	Sig.T	
P Instruction		.56084	.29685	2.88100				
	Constant			2.561103		2.041	0.0421	
	Study Habits			0.032723	0.012344	0.210	0.8336	

There is a standard beta of -.012344Sig at.8336 (t value=.210), which is shown in the table above. Since the p-value is larger than.05., the null hypothesis H03a may be adopted instead of H03.

H_{04}: Students' perceptions of teaching in a virtual learning environment are closely tied to their interaction experience.

H_{04a}: The impression of teaching is inversely connected to the experience of interaction in a virtual learning setting.

Table 4. 30 Regression Analysis

Dependent Variable	Independent Variable	R	R(2)	Standard Error Beta	Beta	T	Sig.T
P Instruction		0.56084	0.29685	2.88100			
	Constant			2.561103		2.041	0.0421
	Study Habits			0.034695	0.325438	5.046	0.00**

It is 0.315438 at 0.0000 (t value=-2.074) that the standardized Beta is. Due to the p-value being below.05., we may accept hypothesis H04 and reject null hypothesis H04.

H05: Students' ideas about how easy it is to use the Internet are strongly tied to whether their school has Internet services.

H05a: There is no clear link between how easy college students think it is to use the Internet and whether they have access to the Internet.

Table 4. 31 Regression Analysis

Dependent Variable	Independent Variable	R	R(2)	Standard Error Beta	Beta	T	Sig.T
PEOU		0.686	0.471	3.478			
	Constant			1.932		3.861	0.0001
	Availability of Internet facilities			0.052	0.286	6.104	0.0000**

As shown in the figure above, the standardized Beta is 0.286276, and the Sig is 0.0000. The t value is 6.104. Because the p-value is below, it is possible to accept hypothesis H05 and reject the null hypothesis H05a. 05.

Reliability

In 1922, Newton and Knight defined dependability as "the consistency or stability of a measure." If the measured property has remained unchanged, the estimate will likely be accurate. The dependability and consistency of an instrument are determined by how well its components fit together and how consistently they measure the same thing (Armstrong, Kraemer, and American College of Sports Medicine., 2016). Cronbach's alpha coefficient was used to determine the consistency and reliability of the survey's various components. Albert and Aba (2017) discovered that the reliability coefficients for the six TAM variables in the virtual learning environment ranged between 0.857% and 0.972%. (See the table below). Virtual Learning has the highest Cronbach alpha score (= 0.7647) for online

perception. For his research, Nunnally (1978) required reliability of 0.70. These values for dependability are significantly greater than these standards.

Table 4. 32 Reliability Statistics of TAM variables

Dimensions of TAM	Mean	Standard deviation	Cronbach's Alpha reliability coefficients	Evaluation based Sekaran 2000
Perceived Usefulness of Internet	2.999	0.3531	0.7177	Acceptable
Perceived Easiness of using Internet	3.0421	0.2785	0.6784	Acceptable
Perception of IT in virtual learning	3.1402	0.2833	0.7647	Acceptable
Perception of Interactive learning	2.8942	0.3562	0.6063	Acceptable
Availability of Internet facilities	2.601	0.4253	0.6112	Acceptable
Study Habits	2.9473	0.2726	0.8844	Good

The alpha values for the TAM variables are shown in Table 4.19. It was found that these values for the feedback dimension of six items were very dependable.

Validity

A valid instrument must be able to perform the function for which it was intended (Dubey and Kothari, 2022). A psychological tool is only valid when used to achieve a specific objective. Validity indicates that the test was utilized for its intended purpose. Therefore, you cannot simply state whether a test's validity is high or low. Instead, you must indicate whether the validity for a particular purpose is high or low (Newton and Knight, 2022). "In their research, Information Resources Management Association (2017) discovered that the modified organizational climate questionnaire can be used to measure organizational climate in a changing environment."

H1a: The number of Internet services available to college students significantly affects how useful they think the internet is.	Not supported
H2$_a$: There is a strong link between how college students' study and how they feel about using VLEs.	Supported
H3a: There is a strong link between how college students' study and how they rate the teaching in VLE.	Not Supported
H4a: How you feel about teaching in a virtual learning environment is linked to how interactive you think.	Supported
H5a: There is a strong link between how easy college students think it is to you the Internet and whether they have access to the Internet at school.	Supported

4.2 Conclusions Drawn from the Research

4.2.1 Patterns of ICT Usage

Thirteen percent of college students have never used the internet, compared to 86 percent of students who have spent at least a year online. In addition, a third of the students in the study had spent at least three years online.

Table 4.7 reveals that 85 percent of students have used the Internet for educational purposes for more than a year. According to these statistics, the Internet is the preferred research tool of most students because it is free and readily accessible. As the number of users of the medium increases, so does its dependence on the growth of its user base.

Nevertheless, only 43% of computer owners have constant Internet access, and only 5% of students have never used an ICT, according to a new study (Table 4.8). Table 4.8 demonstrates that 75 percent of students use mobile phones and laptops as their primary ICT devices. As shown in Table 4.9, the popularity of mobile phones increased by 93.73 percent among college students, while PCs and the Internet ranked third and fourth, respectively—percentage (78.99 percent). The previous table shows ownership and usage of mobile devices, computers, and the Internet. The majority of students are unaware of the concept. The comparison could suggest ICT ownership in multiple ways. Comparatively, only 43% of homes have Internet access, whereas 93% of students use computers and the Internet.

786.8% of internet users use mail chat, followed by 57.5% of students who visit educational websites, 34.80% of internet users who check the news, and 34.80% of internet users who seek employment or business opportunities (34.80 %). One-fourth of one percent. College students' most frequent visits to educational websites are listed in the table to the right. Most college students are comfortable searching the Internet for educational resources. The Internet is a place where many college students can escape and have fun. Students are eager to maintain contact with old friends via email and text messaging.

4.2.2 The usage pattern of computers and the Internet by college students

Two-thirds of student's report using a computer at least once daily, while 26.33 % report using a computer once or twice weekly. As many as 66,3 % of students say they never use a computer, while 8.78 % say they have no access to one. According to Table 4.14, most respondents (26.33 %) report using computers for less than an hour per day. Internet usage by individuals (Table 4.17) Only 9.40% of students, according to the survey, do not use the internet. The remaining students, 38.56 %, use the internet frequently. Most college students use computers daily for academic purposes, followed by those who do so once or twice per week and those who do not use computers at all. Long-term computer usage in the classroom Table 4.16 shows that 12.83 % of students do not utilize computers for educational purposes. Most children use computers for less than thirty minutes per week, with only 10.5% of students using them for more than three to five hours per week. Many hours are spent by academics online (Table 4.16). Only 13.48% of students use the internet for more than 3-5 hours per week, and the majority only use it once or twice weekly. Because of their studies, 14.42% of students spend less than 30 minutes per week on the Internet. This statistic indicates that college students' computer and Internet usage has declined.

These data impacted students' Internet usage and perceptions of a virtual learning environment. Their education is heavily reliant on computers and the Internet. It is estimated that only 12,4 % of students use their VLEs for more than three hours per week.

4.2.3 Ratings

Table 4.10 indicates that, among college students, blogs are the most popular website, followed by Wikipedia, WhatsApp, and Skype, as well as video-sharing services such as YouTube and Myspace. As shown in Table 4.10, more than half of college students are aware of free educational resources and frequently utilize the Internet for academic assistance. When students are attempting to acquire new knowledge, blogs and Wikipedia are two of the most commonly used resources. Most college students use the Internet to find and trade theoretical information,

such as textbooks and lecture notes. However, the popularity of Wikipedia among students highlights the issue of students' reliance on new media as a source of reference information.

4.3 Correlations among several determinants of human characteristics

4.3.1 Gender

Internet connectivity significantly impacts female students' perceptions of VLE usage (Table 4.1). TAM variables, including perceived ease of use and internet access for virtual learning environments, lacked a significant positive correlation with gender (VLE). According to a P-value of 0.05, there appears to be a strong positive association between gender and the widespread use of ICTs in the classroom (Table 4.21). Regarding adopting modern technologies, the perception of comprehensive service has been unaffected by gender. There has been widespread enthusiasm among students of both genders for incorporating contemporary technologies into the classroom.

4.3.2 Age of College students

Students of all ages are enthusiastic about using information and communication technologies in higher education (ICTs). Table 4.21 demonstrates, with a p-value less than.05, that students' age and their use of ICTs for learning are positively related, with a significant positive association between student age and ICT usage. There is no significant correlation between the Technology Acceptance Model and the age of college students. The P value must be less than.05. Perspectives on instruction in the VLE were significantly positively correlated. The research indicates that students of all ages are concerned about the usefulness and application of the Internet and computers. On the other hand, computers and the Internet still have a bright future. As demonstrated, this is the case.

4.3.3 Higher education students' academic performance

As indicated by the statistical test P less than.05, college student's perceptions of their ability to use the Internet and their academic performance are strongly correlated. There is a correlation between college students' Internet proficiency and the amount of research they conduct. College students have found virtual learning environments enjoyable, depending on their level of study. There is no correlation between college students' perceptions of the Internet's educational utility and academic performance. According to the chi-square test (Table4.23), students of all educational levels appear to have no significant positive relationship with using computers and the internet for educational purposes.

4.3.4 Monthly Family Income

As shown in Table 4.22 (P =.05), there is a significant positive correlation between the perceived ease of using the Internet and the monthly family income of college students. A chi-square of 31.122 and a P-value less than.05 indicate that monthly family income and the use of ICT for learning are strongly correlated. The table below demonstrates that children from low-income families are less likely to use the Internet than their wealthier peers. The socioeconomic status of a student has a direct impact on how they utilize ICTs for learning.

4.3.5 Discipline of Study

Engineering and science students are the most likely to use computers and the internet for educational purposes, followed by paramedics; arts and humanities students are the least likely, while commerce students are the most likely. According to a Chi-Square value of 87.54 and a P value of less than 0.05, there is a strong correlation between college students' study discipline and their use of ICTs for learning. There is a significant positive correlation (P-value .005) among college students between academic discipline and Internet accessibility ratings. With a P-value of less than.05, VLE interaction is strongly related to positive outcomes. When the p-

value is less than 0.05, there is a significant relationship between student's perceptions of the VLE and their academic discipline. Students from various academic disciplines have demonstrated a strong interest in the technology adoption model. On the other hand, a significant correlation has been established between instruction and student success in virtual learning environments. In a virtual learning environment, no positive correlations between interaction and student performance have been identified (VLE).

Students who believe they are prepared for virtual learning environments can effectively utilize the technology. Despite the apparent ease of use of the Internet and computers for education, there is evidence that people are not utilizing them. Students are more likely to use a virtual learning environment (VLE) if they perceive it as beneficial. In the correlation matrix, PEOU and PU students exhibited a positive relationship with VLE Instruction and Interactivity, indicating that these students are comfortable with the Instruction and Interactivity of the Virtual Learning Environment (VLE). It has been demonstrated that PU, PEOU, and Instruction and Interactivity can all benefit from virtual learning environments that employ effective study habits and easy Internet access. Internet users utilize and value it more than other conventional media because it allows them to be more socially engaged (Ruggiero, 2000). Observers may deduce the motivations of those who select the media that best suits their objectives (Katz, Odrekhivskyy, Pasichnyk, Rzheuskyi, Andrunyk, Nazaruk, Kunanets, and Tabachyshyn,1974).

The majority of participants in this study communicated via the Internet. People were encouraged to use it due to its information and the ease with which it could be mastered. This can be demonstrated by students' perceptions of usefulness and actual application. In this survey, students indicate that they use the Internet for browsing and interacting as a form of recreation or relaxation. In terms of escape, hedonism, aesthetic pleasure, and emotional release, entertainment content satisfy the needs and desires of its audience (McQuail, 1994). Those who find the media entertaining are likelier to use it (Luo, 2002). There have been new levels of enjoyment and utility as a result of the Internet's distinctive characteristics. On the Internet, you can communicate with individuals or large groups. It is common for people to use the internet to gain knowledge and share it with others.

4.4 Summary

In the previous chapter, we discussed the interpretation and analysis of survey data. The data were analyzed using the Statistical Package for the Social Sciences, and descriptive statistics were used to report the conclusions. The following chapter will examine the research's findings, conclusions, recommendations, and suggestions.

CHAPTER 5

FINDINGS, RECOMMENDATIONS & SUGGESTIONS OF THE STUDY

5.0 Key Findings and Discussions

The study discovered a strong correlation between the number of students who use the VLE and their gender. Internet connectivity in the classroom directly influences the gender makeup of the student body. Men and women have minor differences regarding the utility and convenience of using the Internet to learn. According to the findings, the perceived usefulness and usability of a VLE are unaffected. There appears to be no correlation between college students' education level and their perceptions of the effectiveness and accessibility of the Internet. When this connection is considered alongside other TAM factors, it is evident that students become more comfortable using the Internet as they advance through their education. An additional correlation was discovered between Internet access and academic achievement.

TAM is substantial among college-aged students. Table 4.26 displays a correlation between the perceived benefits of VLE instruction among college students and their age groups. There is no significant correlation between college student's age and the other TAM parameters. Students are more receptive to utilizing a virtual learning environment earlier in their academic careers (VLE).

According to research, students' perceptions of the Internet's usefulness are strongly correlated with their academic discipline. Students' Internet usage increases in tandem with their intellectual development. Table 4.24 shows a correlation between the type of virtual learning environment (VLE) used by students and their Internet usage habits.

To determine whether a virtual learning environment is acceptable, it is believed that the type and field of study play a significant role. As evidenced by the positive shifts in their opinions, students' perspectives on collaboration in a VLE have shifted positively. There is no correlation between the perceived usefulness and convenience of an Internet application and its frequency of use. A virtual learning environment should not hinder your progress if you lack the necessary skills or technology. In addition, we discovered a correlation between Internet connectivity and

perceived usefulness in a virtual learning environment. The bivariate Pearson's correlation coefficient indicates a positive and substantial relationship between perceived effectiveness and perceived ease of use.

Consequently, perceived usefulness is crucial to ICT adoption in online learning environments. Even if an application is challenging, many people are willing to adopt it due to the positive correlation between the perceived utility of the Internet and a person's behavioural desire to utilize it. This relationship between perceived utility and perceived ease will affect students' attitudes and behaviours in a virtual learning environment. There is a positive correlation between perceived usefulness and instructional and interactive online learning aggregates (P-value 0.00). Perceived ease of use, instruction, and interactive participation are all similar. Consequently, students can pursue their education without engaging in virtual reality immersion.

Students have a favourable view of a virtual learning environment because they believe the internet provides administrators and educators with pertinent, clear, and promising information.

According to the significant correlation (r =.2932) between Internet facility availability and perceived utility, infrastructure availability is crucial for determining the Internet's perceived usefulness. Internet service availability and accessibility are significantly correlated (r,.4899). Internet connectivity benefits both VLE communication and VLE education. Therefore, positive student perceptions of online education strongly correlate with this characteristic.

The correlation between study habits and perceived usefulness were found to be 0.403. Perceived Ease of Use correlates highly with study habits (r, .3001). Perceptions of Instruction (r,.2719) and Interactivity (r,.2719) indicate that students' study habits have a significant impact on their opinions of VLE (r, 5001).

Internet Perceived Usability strongly correlates with ICTs for learning and actual usage (r, .1389). No correlation appears to exist with any other TAM variable. There is no correlation between the perceived usability of ICTs and their actual adoption. This study demonstrates that students prefer to use technology when it benefits them. The Chi-square test results were significantly affected by gender, age, academic discipline, and the number of years spent online.

According to the chi-square test results, there was no correlation between ICT proficiency and academic standing among college students.

5.1 Implications of the Results

Positive-attitude students are believed to be better prepared for virtual learning environments regardless of their lack of computer or psychological literacy. Given the rapid rate of change in the education industry, students with a positive outlook are more adaptable and eager to adopt virtual learning. A student's perceptions of a virtual learning environment are more likely to be positive if they are more familiar with information and communication technologies. According to Passmore, a lack of infrastructure and student habits may hinder virtual learning (2000). According to the researchers, there are two possible external influences on TAM: the availability of Internet facilities and students' study habits.

Understanding this topic may aid administrators and faculty in higher education in comprehending and implementing the best practices for creating an engaging virtual learning environment. Because perceived ease of use and actual ICT usage is unrelated TAM factors, perceived usefulness is crucial in promoting technology adoption. This demonstrates that TAM varies from culture to culture, as its elements are not entirely related.

Students online have demonstrated a positive attitude toward education and communication. There was no correlation between the intention to use ICT and actual ICT usage, suggesting that a positive attitude toward behaviour does not require actual ICT usage (ICTs). Like the rest of society, most college students utilize computers and the Internet. This number will likely increase in the coming years, as will their reliance on online education. Virtual learning environments will only be utilized by students who have found them beneficial (VLE). Students use VLEs and other instructional media because they are convenient and valuable. According to the findings of this study, students are enthusiastic about open educational resources (OERs), engagement, and education.

5.2 Conclusion

In a virtual learning environment, students who are less comfortable with computers and the internet are at greater risk. Despite its negative connotations, Internet use for educational purposes is daily among students. Students frequently utilize virtual learning environments (VLEs) because they view them as valuable resources. Due to their familiarity with ICTs, students may not necessarily know how to use the VLE. Administrators in higher education will need to be aware of this issue to promote positive attitudes toward using the internet and computers in a virtual classroom.

Students' ability to effectively utilize ICTs in their education was one of the study's objectives. Researchers were surprised by some unexpected outcomes when using a uniform sampling procedure.

Regarding the Ease of Using the Internet, the age of the students is a crucial factor. It has been demonstrated that the perceived usefulness and usability of the Internet are independent of gender. Internet connectivity and study habits significantly influence the perceived utility and convenience of virtual learning environments. Acceptance of a virtual learning environment could be affected by individuals' desire to utilize technology and the availability of technology.

There is a strong correlation between students' perceptions of the usefulness and simplicity of virtual learning environments (VLEs). All of these factors contribute to the development of self-confidence and skill enhancement. According to the research findings, students who view the Internet as a useful and convenient tool are more likely to accept online education and interactive learning. This demonstrates that students have the necessary skills to adapt to a virtual learning environment. According to the research, a student's experience and academic topic influence the use of ICT as a learning tool. Preparing students for a virtual learning environment necessitates a positive attitude and the desire to apply information and communication technologies (ICTs) in the real world.

5.3 Recommendations

1. Since this study demonstrates that students are enthusiastic about using the Internet for educational purposes, it is suggested that universities use a blended teaching format that combines online and offline components and, as a result, can create electronic learning resources for students using videoconferencing and audio conferencing in addition to the Internet.

2. It has been observed that the e-learning platform should be made more user-friendly. The platform's use requires intense concentration, and users have encountered obstacles.

3. To meet the rising demand, institutions must invest in alternative energy sources, such as diesel or gasoline-powered generator sets and solar electricity.

4. Users of e-learning platforms should be retrained, and colleges should implement rigorous tutorials to assist individuals in understanding how to use the media. Academics determined that training should consider the fact that some computer users do not fully comprehend how to use computers and that these users require additional consideration.

5. Students must be provided with a thorough explanation of e-learning platforms before they can utilize them effectively as educational tools.

6. The findings of this study suggest that different Botswana educational institutions could benefit from implementing the strategies mentioned earlier for enhancing e-learning platforms.

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Appendix

APPENDIX 1

INFORMATION SHEET AND FORM OF AGREEMENT (INFORMATION AND CONSENT)

My name is Nadia Bibi Khan, and I am a medical student at BOTHO UNIVERSITY in my last year of study.

I am doing research on how Gaborone's college students see their own readiness to learn in a virtual learning environment. As a result, I would appreciate hearing about your thoughts and experiences with using a virtual learning environment.

Aims and outcomes of the research

The research aims to find out how students feel about studying in a virtual environment and whether they are equipped to do so. From a survey of literature, it is commonly agreed that extraordinarily little research has been done on the barriers to adopting virtual learning from the student perspective. That is why educational policymakers may use the outcomes of this research as guidance for improving the virtual learning environment for college students.

The government's attempts to enhance the quality of education, particularly at the postsecondary level, might benefit from research on these aspects. As a result of this study paper's publication, many students and specialists in this subject will be inspired to do more studies in this area.

YOUR PRIVACY AND RIGHTS

Taking part in this study is completely optional, and your choice will be honored if you choose not to participate. The data will only be used for this research project. Your name is not required, but your initials. Only the researcher will be able to access the information. Confidentiality and anonymity will be maintained throughout the investigation by using numbers and codes. However, if the results are applied, future students may profit from the study. Please sign the form below if you are willing to participate in this study.

Consent statement

I have been given the chance to respond to the study's questions. I accept that I may withdraw from the study at any moment throughout the trial without incurring any penalties.

Yes, I will participate in this study

Student Initials.........................

Signature of participant……………… date……………….

Signature of researcher………………. date…………………

Appendix 2

Research Questionnaire (Google Form)

An EXPLORATION OF THE VIRTUAL LEARNING ENVIRONMENT WITH
REFERENCE TO THE PERCEIVED PREPAREDNESS OF COLLEGE
STUDENTS IN GABORONE

Research Questionnaire

Name of the College:

Course & Discipline

Gender

○ Male

○ Female

○ Other: _____

Tick only (one)

○ Less than 19 years

○ 19-20

○ 20-23

○ More than 23 years

○ Other: _____

Your Family Income per month

○ Less than 10,000 Pula

○ P 10,001-P20,000

○ P20,001-P30,000

○ P30,001 & above

○ Other: _____

Appendix 3

Application for Research Permit: An exploration of the virtual learning environment with reference to the perceived preparedness of college students in Gaborone

Appendix 4

Appendix 5

Figure 2 Screen shots from SPSS, to substantiate that the data analysis was conducted using SPSS, include table captions

Appendix 6

Language Certificate

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06 OCT 2022

RE: CERTIFICATE OF LANGUAGE EDITING

To whom it may concern

I hereby confirm that I have proof read and edited the following THESIS using Windows 'Tracking' System to reflect my comments and suggested corrections for the author(s) to action:

AN EXPLORATION OF VIRTUAL LEARNING ENVIRONMENT WITH REFERENCE TO THE PERCEIVED PREPAREDNESS OF COLLEGE STUDENTS IN GABORONE.

Reference

- Author(s):   NADIA BIBI KHAN
- Affiliation: Botho University

Although the greatest care was taken in the editing of this document, the final responsibility for the product rests with the author(s).

Sincerely

06/10/2022

SIGNATURE