



## ABSTRACT

In the drive towards delivering world-class services, universities are relying increasingly on web-based solutions such as web-sites for information dissemination and web-based portal solutions for student university interactions to make their operations more cost-effective and timely, and to reach a wider audience. In Nigeria, several universities have adopted web-

## IMPACT OF WEB-BASED SOLUTIONS ON STUDENT RELATED SERVICES: *Case Study of the University of Maiduguri, Nigeria*

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### Introduction

Universities are no longer satisfied with conducting business in the old tradition of waiting for students to approach them for information and services. As Salmi (2009) observes, more and more universities increasingly recognize that there is stiff competition for talent in students, teaching staff, researchers and internationalization, and for resources from the public budget, endowment revenues, research grants and fees. As a result, universities are adopting new methods to reach out to their various stakeholders including taking advantage of developments in information and communication technologies to adopt and deploy those aspects of the technology that serve their purpose. One of those aspects is the Internet and the World-Wide-Web (www or the web) on which



websites are located. Karim and Masrek (2005) noted that portal implementations are helpful in helping enterprises achieve organizational effectiveness. According to Eisler (2003) other than providing a personalized and customizable user interface for accessing both internal and external information, a campus portal also provides the opportunity to create gateways to information and points of access for constituent groups. Today, university websites highlight richness in design and content with several embedded web-based applications.

Web based applications are coded in a browser supported language such as HTML, ASP or PHP so they can be accessed by clients through a web browser. One main software version is installed and maintained on a server so that more than one client can access this version. Some disadvantages of using web-based software is that: (1) the program is usually slower to respond than a typical desktop or client application, (2) web-based applications are limited by the speed of one's Internet connection, while client applications operate as quickly as

*based solutions in the delivery of student related services and this paper examines the extent of use and the impact using the University of Maiduguri (Unimaid), Nigeria, as a case study. The data collected includes the identification of the various student related announcements /services on the Unimaid website over a 12-month period as well as identifying what students go to the Unimaid website to do and how the various stakeholders perceive the web-based solutions. Of particular interest is the identification of the use, if any, of web-based services such as e-payments and web-to-mobile phone services. From the analyses of data collected, conclusions are reached regarding the impact of the various web-based solutions on key student related services while recommendations are made for enhancement and future research.*

**Keywords:** web-based solutions, portal, information dissemination, student services, service delivery, University of Maiduguri.



the client's processor speed, and (3) most information in web-based applications is not accessible when a user is offline. (Whatis.com) Despite the above disadvantages, implementing web-based solutions to improve operational processes have been found to lead to the following benefits (NIMBUS Control, 2007)

- i. Consistency of operational processes
- ii. Transparency
- iii. Improved efficiency of operational processes
- iv. Easier maintenance and dissemination of requirements
- v. Reduced costs for maintaining the system
- vi. Provides the tools to empower staff to improve performance.

Apart from application software, web based solutions that solve information sharing needs are also implemented. These range from simple information dissemination pages (Cloninger, 2000) to complex information sharing across international regions with vastly disparate financial and technological resources (Chiu et al., 2003).

Bajec (2005) noted that today, almost all universities are either developing or purchasing portal solutions for their needs. This is in accordance to the effort being made by the management of the university since 2007, in line with the 2002-2010 Strategic Plan, the University of Maiduguri has made concerted efforts to utilise its website in meeting the varied demands for efficient cost-effective services from its different stakeholders. The University has deployed web-based applications through its website for student registration activities which cut across both pre-undergraduate and undergraduate activities. E-payment interfaces have been incorporated into these web-based applications with the aim of greatly reducing queues on the campus. Another application accessed from the university website is a student portal which was deployed in the 2010/2011 session with the aim of providing a one-stop point for student and lecturer interaction registration, examination score entry/checking, results output, student enquiries, messaging system, etc. The University has also utilised this medium for information dissemination.



The use of portals by university students has been growing steadily and-despite many restrictions such information technology (IT) budgets-investments in portal solutions are still growing. As noted by researchers, portal projects are usually complex, time, cost consuming, and entail a high failure risk. Notwithstanding, the university of Maiduguri Nigeria has embarked on the initiative of creating a web portal for all her students for the past six years and lots of resources have been invested on the project and students have been enjoying the benefits. The assessment of portal impact and benefits is, however, often problematic, since common cost-benefit analysis methods do not take intangible impacts and intervening environmental variables into account. Similarly, measuring the success of information systems (IS) and understanding the return on investments on IT is the focus of a large and growing body of research (Dehning and Richardson, 2002).

### **Statement of the Problem**

It has been discovered in recent years that web-based is being canvassed by several people as being effective in improving teaching and learning. In the present information age, the issue of students' use of web-based is of crucial importance. This is so because the use of web-based by students would enhance competence and confidence in them. However, many students still patronize traditional book materials as a source of information in our universities rather than web-based that is more efficient and reliable; hence, the need for the study.

### **Objective of the Study**

The general objective of the study is to examine the extent of use and the impact of web-based services in University of Maiduguri, Maiduguri, Nigeria. The specific objectives are to:

1. identify what students go to the University of Maiduguri website to do;
2. examine the perceptions of stakeholders on the use of web-based solution in University of Maiduguri;



3. investigate whether special skills and knowledge of computer are required in order to use the web-based services in University of Maiduguri.

### **Research Questions**

The following questions were formulated to guide the study:

1. What students go to the University of Maiduguri website to do?
2. What are the perceptions of stakeholders on the use of web-based solution in University of Maiduguri?
3. What are the special skills and knowledge of computer are required in order to use the web-based services in University of Maiduguri?

### **Hypothesis of the Study**

The Null hypothesis of the study was formulated in view of the above objectives;

**Hypothesis (Ho<sub>1</sub>):** Web-based services have not significantly eliminated queues in service delivery in University of Maiduguri.

**Hypothesis (Ho<sub>2</sub>):** There is no significant relationship between knowledge of computer and utilization of web-based services in service delivery in University of Maiduguri.

### **Significance of the Study**

This study will be useful to administrators, lecturers and students of tertiary institutions. To a large extent, the literature, methodology and findings of this study will serve as reference materials for researchers who wish to investigate related problem.

### **Literature Review**

#### **The Concept of Web/E-Portal**

The concept of an Internet Portal is a relatively recent phenomenon. It is seen as collection of information and services of an enterprise or as a community accessible to members through a single secure and customizable Web site. An Enterprise Portal is a user-centric enterprise-wide web-based system that incorporates a sophisticated integration of



all types of information content and services. As a core organizational information system, it is often an internally developed and designed to suit the particular needs of organizational stakeholders (employees, clients, customers). A campus portal is an instance of an Enterprise Portal in a tertiary educational institution. It is usually referred to as ‘campus portal’. Campus portals were pioneered by UCLA in 1999, to be followed by similar systems at the University of Washington and the University of Buffalo (Moskowitz, 2001).

Roberts-Witt (1999) claimed that there are three types of portals. These are: Data Portals which is concerned with managing such structured data as corporate databases with a single point of access. Information Portals, this is similar to the Data Portals. This type of portal is concerned with managing such unstructured data as e-mail, text, and other documents by using indexing and cataloguing systems with search and retrieval functionality. Collaborative Portals is the type that focus on group interactive functionality as well as the integration of the enterprise by bridging intranet, extranet, private source data, and public information. The users are also allowed to access all collaborative functions such as classified topics, conferencing, team discussion, news channel, calendaring, and the abilities to personalize the interface. Fuangvut and Hasan (2005) assert that campus portals have many specialized features. However, they are distinguished by their main user-base: the students. Although students are a critical component of the social life of the institution, they are not employees. Nor can they necessarily be considered the organization’s customers, as they are frequently not the ones paying the bills. Like most professional organizations, an educational institution has two types of employees, in their case academics and administrative staff. Consequently, the set of stakeholders involved in a campus portal is quite diverse and their needs complex. Base on this, Fuangvut and Hasan (2005) summarized the characteristics of campus portal as including: “personalization, customization, easy to use, categorization, single point authentication and access, powerful unified search engine, unified presentation of information, communication and collaboration tools and security”.



The e-portal was developed for the University of Maiduguri students and staff Records Management. It is intended to document the processes, to manage students' admission, registration, academic records, courses administration, online results and transcript processing, online payments (payment via the portal using online electronic means), assignment of courses to lecturers ([www.unimaidonline.net](http://www.unimaidonline.net)).

### **Impact of Web-based Solutions**

The web portal is implemented in order to provide e learning and web integration facilities. This has proven to be very convenient in flexible administration and integration purposes. Web portal comprises of appropriate learning and communication tools that can enable translators to upgrade their knowledge and skills in the use of current localization technologies, from anywhere, anytime, at their own pace. Participant in an e- learning course can be a teacher to the rest of participants. With their help, and assisted by a course facilitator, each participant should be able to construct his or her own knowledge and technical skills using the learning resources available in the course Web portal. This pedagogical methodology is known as Social Constructivism.

According to Guzmán (2005), a Web portal is a means by which translators can get training in localization tools. Normally, the portal (e.g. Blackboard) provides a number of assignments with instructions on how (and why) to perform different tasks with different localization tools. The course facilitator is available to help (rather than teach) participants in real time by using a chat room at scheduled times. The use of a discussion board lets course participants to organize an online community where they can post questions on these tools and discuss problems and possible solutions with their course peers. There are other important effects resulting from the use of an e-portal system. This may include improvements in learning performance, effectiveness, domain or knowledge, and decision making (Cuzmain, 2005). In this study web portal impact on e-learning refers to the impact on individual users in terms of enhancing information sharing, information needs and processing of each user. Web-portal system contains all the tools and



resources required for e-learning university: study navigator to guide the learning process, software and resources for the learning management system (LMS), core curricula, training content; means for innovative training; tools for assessment and certification. Web portal is an information system, going by Rao (2006) description of an information system that was implemented in a real-world setting along with an information systems success survey incorporating the three suggested factors of information system success. This paper presents the results of measuring and monitoring a university student services system (Web-based solutions). The study includes three parts: a stakeholder's perception survey, statistics of system usage by students, and the impact/benefits of the system on students' related services, and the challenges. It was found that the new system not only decreases overall operational costs, but also increases the service levels to students and increases overall student satisfaction. In addition to the cost savings, increased service levels and student satisfaction, the implication of the study is that through student survey results, the university management and students are also realizing reliability, quality, and security when using the system. Web-based solutions contain a variety of contents that can be classified into three groups: pedagogical and research, informational and communication, and administrative (Popovic, Lindic, Stemberger, and Jaklic (2009). Through the web-based solutions, Lecturers are able to publish news, prepare term plans, and use document system to publish course materials. Lecturers, students, and external collaborators (e.g. guests from business sphere) can collaborate with each other in on-line discussions. Students are able to access on-line study materials and sources and take web-based exams. Popovic et al. (2009) also pointed out that with the help of web portal, surveys carried out at the end of each course, the gathered data is promptly analyzed, and results delivered to faculty and staff to provide feedback for educational process improvement. Informational and communication elements include different information connected with the study (e.g. news from courses, important assignment dates, changes in teachers' office hours, exam examples and practice etc.) and information regarding corporate relations, international relations, and



career services. It is also noted that web portal elements cover administrative processes, including students signing up for final exams, reviewing their current and past grades, filling out administrative forms and ordering various certificates (e.g. Certificates of enrolment, certificates of passed exams, GPA etc.), reviewing available jobs from partners, or looking for available internships. Learners and teachers of e-learning can manage their email accounts, record their working time, and review received assignments.

Web-based has really imparted students' lives in University of Maiduguri, Borno, Nigeria. This is so because the world is moving at an unimaginable speed in the areas of information dissemination (Okiki, 2011). This is corroborated by Olaniyi (2006) who opined that the use of ICT can be transferred and cross fertilized in real time. He further observed that it is one of the educational challenges of the modern age about which progressive academic institutions must make bold efforts to excel and compete favourably in the global market where education is a commodity.

The researcher observed that the state of web-based in University of Maiduguri, Borno, Nigeria is the same in other universities in Nigeria. This is so because of the arrival of educational technology vis a vis instructional technology whether as a field of education or new terminology to what has been before like teaching, aids or apparatus as it was earlier called (Abimbade, 2002).

Current achievements in the field of computer and information technologies have now offered tremendous opportunities for learning by electronic means (Rozina, 2002). The use of ICT in Ekiti State University is now seen as a means to improve accessibility, efficiency and quality of learning by facilitating access to information resources and services.

According to Abimbade (2005), the world of technology has continued to grow and the world has become a global village. Kumar and Kaur (2005) state that the current information revolution and increasing impact of information and communication technologies have modernized the process, learning and research in most universities. Several studies provide details about ICT adoption. Ramzan (2004)



observes that expert systems, wireless networks, virtual collections, interactive web interfaces, virtual reference services, and personal web portals have brought changes since the start of the new millennium. Ramzan (2004), in his study, observed that librarians in Pakistan were not prepared to embrace the changes brought by information and communication technologies. Most of them were not even sure about ICT applications in their libraries. They were also uncertain about the benefits of these new technologies for their organizations since they have little knowledge of ICT. Islam and Panda (2007) stated that the application of web-based information retrieval trends of researchers is ever increasing and the electronic material will eventually replace the traditional library and users need not go there to find and collect information they need. Al-Ansari (2006) focused on the internet use by the faculty including purpose of use, impact on teaching and research, internet resources that they use and the problem faced while using the internet. It was discovered that majority of them have been using the computer and internet for more than five years. The internet has helped them save time, find up-to-date information and compare with their colleagues. Almost all of them want to improve their internet use skill through formal training.

Shahriza et al. (2007) found that website is seen as an increasingly important reading source. Genoni et al. (2006), in their study, indicated that the research users are positive regarding the usefulness of the internet for research purposes and for expanding their scholarly community. Kinengyere (2007) stated that availability of information does not necessarily mean actually use. This showed that users are not aware of the availability of such resources or they do not know how to access them or they do not know what they offer. The study suggested that these call for continued information literacy programme. Over the years, the internet has become an all important technological tool in the production, marketing, and use of information worldwide. Bemah (2002) stated that the exponential growth in information and knowledge and the corresponding increase in users' needs have stipulated a greater degree of technological inventions and strategies towards the



management, transmission/dissemination, organization and the use of information.

ICT use in teaching and research has become the norm across tertiary institutions where students have been identified as stakeholders in its development and implementation (Ling et al., 2001; Petrova and Sinclair, 2005; Lee and Nguyen, 2005). Universities have sought methods of developing ICT skills into the curriculum for teaching and learning of students Jerry et al. (2001). Universities and other tertiary institutions have indicated that ICT has a generally positive effect in the quality of teaching and learning, although a few have been able to offer detailed evidence (Goldsman and Syer, 1999; Petrova and Sinclair, 2005; OECD, 2005).

Empirical studies concerning web-based, its importance and usage among students can be noted. For example, Dorup (2004), in a study of undergraduate medical students in Denmark, found that most students have access to computers at home as well as using internet regularly. It has been observed that the traditional method of lesson delivery and educational services can no longer meet the demand for education especially in Africa World Bank (2001). Ene (2001) opines that IT (ICT) makes communication between persons, establishments and so on to be more convenient, faster and precise. Ene (1998) had earlier shown that this present age is an information driven age which is an era of sophisticated interconnectivity of information through the net. It is this revolution that gave birth to satellite beam of instructional radio and television to remove villages and urban classroom, video recordings of teaching sessions, the marriage of compact disc and computer technologies which enables us to have an entire library at our fingertips and to "walk" or "fly" in simulated "virtual" "reality" environments, the joining of computer networks worldwide via internet and the focus on electronic wizardry linked by information superhighways to bring knowledge in all its splendor within the reach of everyone (Hackbarth, 1996).

Keatinge (1896) alluded to Comenius John Amos (1592 to 1670) who promoted this aspect of communication. This he described in his Great Didactic (1896) where he opined that a worthy classroom should be



flooded with pictures, map and charts. He also designed an illustrated picture book for children, "The World in Pictures" having each page containing drawings accompanied by stories in Latin and vernacular which had been translated to English in the book by Keatinge. However, over two decades ago, according to Hackbarth (1996) (that is, three decades from the present publication), the Carnegie Commission reported that education now faces the first great technological revolution in five centuries in the potential impact of the new electronics.

Research findings have shown that ICT has helped students to learn better and has enhanced performance. Hills (1990) opined that the computers will enable primary school pupils to be better organized and to have enhanced performance. Watson (1993) showed that students spend longer time in the learning task when they use ICT. Boolian (1994) discovered that students who use ICT develop new strategies for problem-solving, and also develop higher order thinking skills (Carthart, 1990). These findings are all reported by Aremu (2001). Afolabi (2009) observed that a random sampling of ICT in the universities in Nigeria shows that the prospects of ICT and the ideal situation of educational research in our ICT driven campus is still a mirage. Auwal (2009), in his own view, opined that there are some unique attributes offered by ICT such as for reducing isolation, facilitating dialogue, participation and fostering interactive networks. He went further to observe that those using ICT can be producers of their own information, and not just being passive recipients. Uzo (2006) sees Information and Communication Technology as major factor in shaping the new global economy and producing rapid changes in the society.

Gender consideration continues to feature in research finding for quite a long time. Each time it comes up in research; the result has always been inconclusive. This is why questions like "Is there any gender gap in computer attitudes use?" will continue to re-echo as it was raised by Luchetta (2000). Ordinarily, the females will be portrayed as more likely than males to be plagued with computer anxiety. Some literature review by Luchetta showed that the gender gap in closing up and that significant differences exist where gender is considered alongside other variables like age, experience, exposure and so on. For example, no gender differences were found in an introductory computer course in



a university setting, despite the author's expectation to the contrary (Barrier and Margivio, 1993). Afolabi et al. (2005) analyzed gender as a variable associated with the use of and attitudes about asynchronous learning networks (ALN) in a university setting. The authors found that both males and females made similar use of ALN, had similar (positive) attitudes about their computer experience, and shared a common desire to take more courses using computers.

### **Diffusion of Innovations Theory**

Diffusion of innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures (Richard, Florence, & Zénon, 2015). (Rogers, 1995) explained diffusion as the process by which an innovation is communicated through certain channels over time among the participants in a social system. The origins of the diffusion of innovations theory are varied and span multiple disciplines. The four main elements of diffusion are the innovation, communication channels, time, and the social system. Diffusion is a special type of communication, in which the messages are concerned with a new idea. It is this newness of the idea in the message content of communication that gives diffusion its special character. This process consists of a series of actions and choices over time through which an individual or an organization evaluates a new idea and decides whether or not to incorporate the new idea into ongoing practice. This behaviour consists essentially of dealing with the uncertainty that is inherently involved in deciding about a new alternative to those previously in existence. It is the perceived newness of the innovation, and the uncertainty associated with this newness, that is a distinctive aspect of innovation decision making (Rogers, 1995). This theory is related to the study as it presents the process of newness, implementation and consequences of the innovation as regards the web-based services.

### **Research Methodology**

#### **Research Design**

This research study employed descriptive and ex post facto research design.

#### **Population and Sample**

The population of the study is made up of the 4000 stakeholders (students, lecturer, and administrator) in the faculty of Education,



Department of Education. The study employed purposive sampling technique and Yamane (1967) proportionate sampling formula to purposively select 364 respondents for the study. Yamane (1967) proportionate sampling formula was used below for drawing a justifiable out of the total population of 4000 as presented below;

$$n = \frac{N}{1+N(e)^2}$$

where;

n = Required Sample Size

N= Population of Groundnut Farmers

e= Level of significance (5%)

Therefore;

$$n = \frac{4000}{1+4000(0.05)^2}$$

$$n = \frac{4000}{11}$$

$$n \approx 364$$

### **Method of Data Analysis**

The demographic data and research questions were analyzed using descriptive statistics (Mean, standard deviation, frequency and percentage) while inferential statistics (ANOVA and Pearson product moment correlation coefficient) was used to test the hypotheses.

### **Data Analysis, Results and Interpretations**

This study was conducted to examine the extent of use and the impact of web-based services on in University of Maiduguri, Nigeria. The demographic data and research questions were analyzed using descriptive statistics (Mean, standard deviation, frequency and percentage) while inferential statistics (ANOVA and Pearson product moment correlation coefficient) was used to test the hypotheses. Three hundred and sixty-four (364) copies of questionnaires were administered but only three hundred and fifty-six (356) copies were retrieved, making 98% return rate. The results were presented in tables and discussed according to the research, questions and hypotheses.



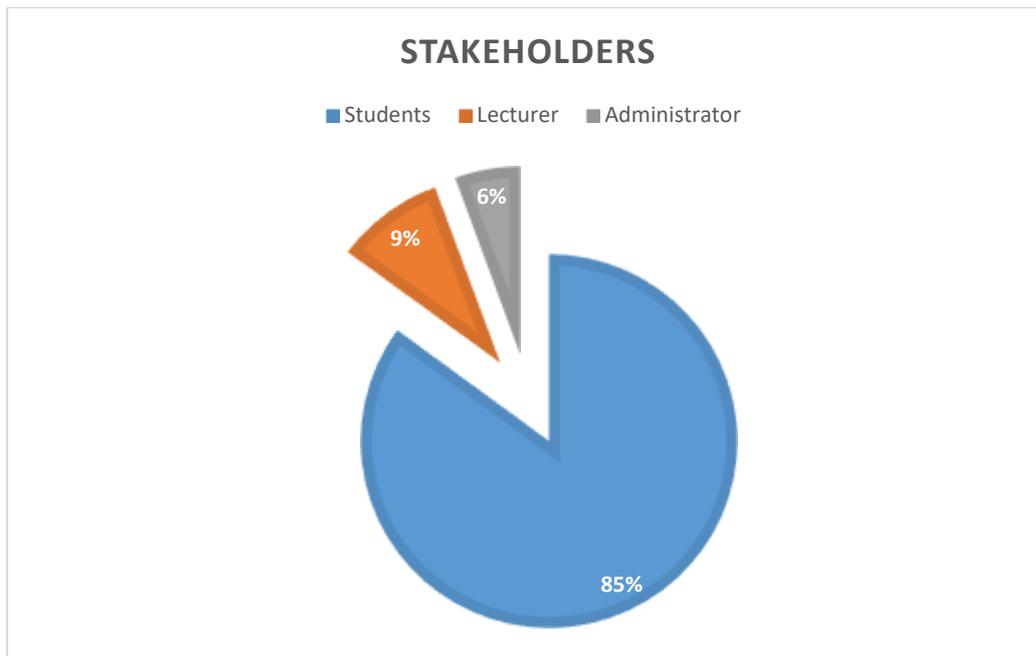
**Table 4.1: Demographic Characteristics of the Respondents**

n =356

<b>Variables</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Age</b>		
18-30 years	130	36.5
31-45 years	132	37.1
46-65 years	44	12.4
66 years above	50	14.0
<b>Educational Qualification</b>		
M.Sc/PhD	11	20.8
Degree/HND	22	41.4
Diploma/NCE	20	37.7
<b>Level</b>		
100	75	24.8
200	75	24.8
300	75	24.8
400	78	21.9
Students	303	85.1
Lecturer	33	9.3
Administrator	20	5.6
<b>Gender</b>		
Male	222	62.4
Female	133	37.4
<b>Total</b>	<b>356</b>	<b>100.0</b>

**Source:** Field Survey 2021

Table 4.1a described the demographic characteristics of the respondents; 356 respondents participated in this study, out of which 36.5% were between the ages of 18-30 years, 37.1% were between the ages of 31-45 years, 12.4% were between the ages of 46-65 years, 14.0% were between the ages of 66 years above, 20.8% had M.Sc/PhD, 41.4% had degree/HND, 37.7% had diploma/NCE, 24.8% were 100, 200 and 300 level students, 21.9% were in 400 level of which 62.4% were male and 37.4% were female making a total number of 356 (100%) respondents.



Source: Field Survey 2021

**Research Question 1:** What students go to the university of Maiduguri website to do?

**Table 4.2: What Students go to the University of Maiduguri Website to do**

S/N	Statement	SA	A	UD	DA	SDA	Total
1.	To check for announcement such as resumption date and deadline etc.	170(48.0%)	112(31.6%)	14(4.0%)	40(11.3%)	16(4.5%)	352(100.0%)
2.	To check for result	142(39.9%)	158(44.4%)	32(9.0%)	20(5.6%)	14(1.1%)	352(100.0%)
3.	To search for academic publications/research works on the site	156(43.8%)	124(36.5%)	42(11.8%)	24(6.7%)	10(2.8%)	352(100.0%)



4.	To receive information emanating from the web-based data as text messages on mobile phone	80(22.5%)	<b>194(54.5%)</b>	40(11.2%)	28(7.7%)	14(3.9%)	<b>352(100.0%)</b>
5.	Using e-payment platform to pay school fees.	76(21.3%)	<b>158(44.4%)</b>	44(12.4%)	58(16.3%)	20(5.6%)	<b>352(100.0%)</b>

**Source:** Field Survey 2021

Table 4.2 shows the socioeconomic factors that influence credit accessibility in the study area. Item one above show that, (48.0%) and (31.6%) of the respondents strongly agreed and agreed respectively with the statement, 4.0% were undecided, while 11.3% and 4.5% disagreed and strongly disagreed respectively with the statement. One can conclude that students do go the school website to check for announcement such as resumption date and deadline in the study area. From statement two above, 39.9% strongly agreed, 44.4% agreed, while 9.0% was undecided. Furthermore, 5.0% disagreed and 1.1% strongly disagreed with the research statement respectively. One can infer that students do go the school website to check for result in University of Maiduguri. Item three above show that, (43.8%) and (36.5%) of the respondents strongly agreed and agreed respectively with the statement, 11.8% were undecided, while 6.7% and 2.8% disagreed and strongly disagreed respectively with the statement. One can conclude that students do go to the school website to search for academic publications/research works in the study area. From statement four above, 22.5% strongly agreed, 54.5% agreed, While 11.2% were undecided. Furthermore, 7.7% disagreed and 3.9% strongly disagreed with the research statement. One can infer that students do go to the school website to receive information emanating from the web-based data as text messages on mobile phone. Item five above



show that, (21.3%) and (44.4%) of the respondents strongly agreed and agreed respectively with the statement, 12.4% were undecided, while 16.3% and 5.6% disagreed and strongly disagreed respectively with the statement. One can conclude that students do go to the school website to use e-payment platform for payment of school fees in the study area. Majority of the respondents see the usefulness of web-based use though costlier than the traditional book. It was discovered from the findings that web-based sources were the most preferred place for the accessibility of information by the students and it is not costly.

**Research Question 2:** What are the perceptions of stakeholders on the use of web-based solution in University of Maiduguri?

**Table 4.3: Perceptions of Stakeholders on the use of Web-based Solution**

S/N	Statement	SA	A	U	D	SD	Total
1.	It eliminates queues in service delivery	136(38.2%)	112(31.5%)	24(6.7%)	52(14.6%)	32(9.0%)	352(100.0%)
2.	It improves efficiency in service delivery	112(31.5%)	186(52.2%)	20(5.6%)	24(6.7%)	14(3.9%)	352(100.0%)
3.	It facilitates research	140(39.3%)	130(36.5%)	54(15.2%)	20(5.6%)	12(3.4%)	352(100.0%)
4.	It facilitates learning	54(15.2%)	94(26.4%)	44(12.4%)	100(28.1%)	64(18.0%)	352(100.0%)
5.	It enhances students-lecturer	140(38.2%)	136(38.2%)	36(10.1%)	34(9.6%)	10(2.8%)	352(100.0%)



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**Source:** Field Survey 2021

Table 4.3 shows the perceptions of stakeholders on the use of web-based solution in University of Maiduguri. Item one above shows that, (38.2%) and (31.5%) of the respondents strongly agreed and agreed respectively with the statement, 6.7% were undecided, while 14.6% and 9.0% disagreed and strongly disagreed respectively with the statement One can conclude that web-based service eliminates queues in service delivery in University of Maiduguri. From two above, 31.5% strongly agreed, 52.2% agreed, while 5.6% was undecided. Furthermore, 6.7% disagreed and 3.9% strongly disagreed with the research statement respectively. One can infer that web-based service improves efficiency in service delivery in the study area. Item three above show that, (39.3%) and (36.5%) of the respondents strongly agreed and agreed respectively with the statement, 15.2% were undecided, while 5.6% and 3.4% disagreed and strongly disagreed respectively with the statement. One can conclude that web-based service facilitates research in the study area. From statement four above, 15.2% strongly agreed, 26.4% agreed, while 12.4% was undecided. Furthermore, 28.1% disagreed and 18.0% strongly disagreed with the research statement. One can infer that web-based service facilitates learning. Item five above show that, (39.3%) and (32.6%) of the respondents strongly agreed and agreed respectively with the statement, 23.0% were undecided, while 20.8% and 9.0% disagreed and strongly disagreed respectively with the statement. One can conclude that web-based service enhances students-lecturer relationship in University of Maiduguri.

**Research Question 3:** What are the special skills and knowledge required in using the web-based services?

**Table 4.4: Special Skills and Knowledge required in using the Web-based Services**

S/N	Statement	SA	A	U	D	SD	Total
1.	Basic computer skills/knowledge )	116(32.6%)	162(45.5%)	40(11.2%)	26(7.3%)	12(3.4%)	352(100.0%)



2.	Ability to use and navigate through the internet/webserver	74(59.7%)	<b>146(41.0%)</b>	70(19.7%)	46(12.9%)	20(5.6%)	<b>352(100.0%)</b>
3.	Ability to browse through the internet/webserver	96(27.0%)	<b>164(46.1%)</b>	36(10.1%)	44(12.4%)	16(4.5%)	<b>352(100.0%)</b>
4.	Ability to identify what you want in the website	86(24.2%)	<b>158(44.4%)</b>	50(14.0%)	44(12.4%)	18(5.1%)	<b>352(100.0%)</b>
5.	Ability to evaluate web information	74(20.8%)	<b>128(36.0%)</b>	62(17.4%)	74(20.8%)	18(5.1%)	<b>352(100.0%)</b>

**Source:** Field Survey 2021

Table 4.4 shows the special skills and knowledge required in using the web-based services in University. Item one above show that, (32.6%) and (45.5%) of the respondents strongly agreed and agreed respectively with the statement, 11.2% were undecided, while 7.3% and 3.4% disagreed and strongly disagreed respectively with the statement. One can conclude that the basic computer skills/knowledge is one of the special skills and knowledge required in using the web-based. From statement two above, 59.7% strongly agreed, 41.0% agreed, while 19.7% were undecided. Furthermore, 12.9% disagreed and 5.6% strongly disagreed with the research statement respectively. One can infer that ability to use and navigate through the internet/web-server is one of the special skills and knowledge required in using the web-based. Item three above show that, (27.0%) and (46.1%) of the respondents strongly agreed and agreed respectively with the statement, 10.1% were undecided, while 12.4% and 4.5% disagreed and strongly disagreed respectively with the statement. One can conclude that ability to browse through the internet/web-server is one of the special skills and knowledge required in using the web-based. From statement four above, 24.2% strongly agreed, 44.4% agreed, while 14.0% were undecided. Furthermore, 12.4% disagreed and 5.1% strongly disagreed with the research statement. One can infer that ability to identify what you want in the website is one of the special skills and knowledge required in using the web-based. Item five above show that,



(20.8%) and (36.0%) of the respondents strongly agreed and agreed respectively with the statement, 17.4% were undecided, while 20.8% and 5.1% disagreed and strongly disagreed respectively with the statement. One can conclude that ability to evaluate web information is one of the special skills and knowledge required in using the web-based in University of Maiduguri.

**Hypothesis (Ho<sub>1</sub>):** Web-based services have not significantly eliminated queues in service delivery in University of Maiduguri.

**Table 4.5: Summary of Analysis of Variance on Web-based services**

	Sum of Squares	df	Mean Square	F	Significant
Between Groups	127916.100	1	127916.100	2.700	0.000**
Within Groups	379038.800	349	47379.850		
<b>Total</b>	<b>506954.900</b>	<b>350</b>			

F, df 349= 0.015, 2.700 \*\* significant at 0.05

The result in table 4.5 indicates web-based services have significantly eliminated queues in service delivery in University of Maiduguri. This is because the probability value (P = 0.000) is less than alpha ( $\alpha = 0.05$ ) level of significance at a critical value = (2.700), sample size (n= 351), degree of freedom (1 and 349) respectively. Hence, the null hypothesis which states that web-based services have significantly eliminated queues in service delivery in University of Maiduguri is hereby rejected at 0.05 level of significant. Meaning web-based services have significantly eliminated queues in service delivery in University of Maiduguri.

**Hypothesis (Ho<sub>2</sub>):** There is no significant relationship between knowledge of computer and utilization of web-based services in service delivery in University of Maiduguri

**Table 4.6: Result of Pearson Product Moment Correlation on Relationship between Knowledge of Computer and Utilization of Web-Based Services in service delivery in University of Maiduguri**

Variable	n	$\bar{x}$	SD	DF	r	P-Value
Knowledge of Computer	350	64.3886	1.6554	103	0.8997**	0.0019
Utilization of Web-Based Services	350	21.7257	2.39797	103		

Source: Field Survey, 2021



The result in table 4.4 indicates a significant relationship between knowledge of computer and utilization of web-based services in service delivery in University of Maiduguri. This is because the probability value ( $P = 0.0019$ ) is less than alpha ( $\alpha = 0.05$ ) level of significance at a correlation index  $r = (0.8997)$ , sample size ( $n = 108$ ), degree of freedom (103), mean (64.3886, 21.7257) and standard deviation (1.6554, 2.39797) respectively. Hence, the null hypothesis which states that there is no significant relationship between knowledge of computer and utilization of web-based services in service delivery in University of Maiduguri is hereby rejected at 0.05 level of significant. Meaning there was a significant relationship between knowledge of computer and utilization of web-based services ( $r = 0.8997, P < 0.05$ ) in service delivery in University of Maiduguri.

### **Summary of Major Findings**

1. Checking for announcement such as resumption date and deadline, checking of result, searching for academic publications/research works on the site, receiving information emanating from the web-based data as text messages on mobile phone and using e-payment platform to pay school fees were what students do go to university of Maiduguri website to do.
2. Elimination of queues in service delivery, improving efficiency in service delivery, facilitating research, facilitating learning and enhancing students-lecturer relationship were the perceptions of stakeholders on the use of web-based solution in University of Maiduguri.
3. Basic computer skills/knowledge, ability to use and navigate through the internet/web-server, ability to browse through the internet/web-server, ability to identify what one wants in the website and ability to evaluate web information were the special



skills and knowledge required in using the web-based services in University.

### **Discussion of Findings**

The first finding revealed checking for announcement such as resumption date and deadline, checking for result, searching for academic publications/research works on the site, receiving information emanating from the web-based data as text messages on mobile phone and using e-payment platform to pay school fees were what students do go to university of Maiduguri website to do. In agreement with this finding is a study conducted by Aremu (2001) who observed that majority of the students in tertiary institutions do go to the school web-based to check for result, search for academic publications and resumption date respectively.

The second finding revealed elimination of queues in service delivery, improving efficiency in service delivery, facilitating research, facilitating learning and enhancing students-lecturer relationship were the perceptions of stakeholders on the use of web-based solution in University of Maiduguri. This finding conforms to the study conducted by Afolabi (2009) who found that a random sampling of ICT in the universities in Nigeria shows that elimination of queues in service delivery, improving efficiency in service delivery, facilitating learning and enhancing students-lecturer relationship were the perceptions of students on the use of web-based solution in Nigeria Universities.

The third finding revealed basic computer skills/knowledge, ability to use and navigate through the internet/webserver, ability to browse through the internet/webserver, ability to identify what one wants in the website and ability to evaluate web information were the special skills and knowledge required in using the web-based services in University. Aligning with this finding is a study conducted by Dorup (2004), in a study of undergraduate medical students in Denmark, found that most



students have access to computers at home as well as using internet regularly.

The fourth finding revealed web-based services have significantly eliminated queues in service delivery in University of Maiduguri. This finding aligns with the finding of Shahriza et al. (2007) who found that website is seen as an increasingly important reading source and facilitation of service delivery.

The sixth finding revealed a significant relationship between knowledge of computer and utilization of web-based services in service delivery in University of Maiduguri. This finding agrees with the finding of Afolabi et al. (2005) who found that both males and females made similar use of ALN, had similar (positive) attitudes about their computer experience, and shared a common desire to take more courses using computers.

### **Conclusion**

There is no doubt that the web provides an efficient cost-effective platform for reaching out across space and time. The University of Maiduguri which has been used a case study for this paper has shown creativity in the various students related services that have been moved to the web. The deployment of web to mobile phone messages, online e-payment solutions, among others have specifically reduced queues on the campus and generally improved efficiency of operations. Institutions yet to deploy web-based solutions are encouraged to do so.

### **Recommendations**

In the light of the above findings, the following recommendations are made:

1. Training of the three categories Administrators, Lecturers, and Students on the computer navigation and browsing skills necessary for using the various web-based services should be embarked upon by the Management of University of Maiduguri.



2. Administrators, lecturers and students generally agree that special skills and knowledge of computers are required in order to use the identified web-based services.
3. Students are happy with receiving information emanating from web-based data as text messages on their mobile phones.
4. Administrators, lecturers and students are in agreement concerning incorporation of e-payment on the web leading to reduced queues and improved efficiency.
5. The role of the website in information dissemination is very important given the placement of related items by Administrators for visiting the site.

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