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A Webometric Analysis on Websites of Some Selected Tertiary Institutions in Yobe State, Nigeria

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Abstract:
Web presence analysis is a well-known area within webometrics. It usually uses counts of total in-links involving sets of web sites. These total in-links counts are obtained from commercial search engines called Goggle being the only alternative for some studies. URL citation counts and Title mention counts total in-links of some selected tertiary institutions in Yobe state are compared as a web-based indicator. Both URL citation and Title Mention indicates that there is a relationship between their webometric results. The results further showed that there is a relatively lower than expected level of total in-links in some institutions using both URL citation and Title Mention.

Keywords: *Webometric, analysis, websites, tertiary institutions*

1. Introduction

The importance of public information is affirmed by the statement made by Thomas Jefferson, (1880) in his reply to the American Philosophical Society; 'I feel an impassioned yearning see information so dispersed through the mass of humanity that it may achieve even the extremes of public opinion: hobos and kings.' The key, therefore, to disseminating information to every nook and cranny of the world is to make websites easier to use in terms of accessibility, design and technology (Nielsen, 2000).

Björneborn (2004) described the Web as 'the wealthiest wellspring of information-and-deception-ever known to man. Thanuskodi (2012) referred to it as the world's biggest electronic library and public gathering space that contains a huge amount of information. Thelwall (2002) on the other hand, defined it as an important source of information that eliminates the barrier of geographical location. It has been found (especially websites of research institutes and Universities) to be a good source of information for students, researchers, lecturers, Government agencies and the general public, because they have been identified as a mean for publishing open information (Pechnikov and Nwohiri, 2012).

The web is a useful avenue for universities to sell themselves and provide information to potential students, employees, researchers, funding organisations, and others. Some of the main functions of the website include advertisement of their activities (e.g., admission, holidays, and scholarship programmes.), information dissemination to staff and students, teaching and research. The introduction of the Web in universities was to improve the ease and speed with which information is dispersed among educational institutions (Björneborn, 2004). Very limited information is available about how Nigerian universities utilise the web to attain this goal or how the different positions of the universities impact on their pattern of web use thus the need for more research.

Yobe state as of today has about 08 tertiary institutions: 03 Federal institutions (1 University, 1 Polytechnic and 1 College of Education), 05 State institutions (1 University, 3 Colleges and 1 Polytechnic). The history higher institution of learning dates back to the history of universities in Nigeria started with the creation of the Universities College, Ibadan (1948) then connected to the University College-London while the creation of other universities was driven by the growing need of the citizens for tertiary education (Nwagwu and Agarin, 2008). These universities have gone through diverse levels of growth in terms of infrastructure, technology and manpower, and this solely depends on the capability and vision of their owners. Universities in Nigeria are grouped into five generations: first is the premier university (the University of Ibadan), thesecond generation founded between 1970 and 1985 to meet the manpower need after the civil war, the third generation which focused on technology and Agriculture, the fourth and fifth generations that were founded during the third republic (1999). The Federal Government owns the first three generations; the fourth generation is a state owned while the fifth are mainly private and mission universities (Nwagwu and Agarin, 2008).

1.1. Statement of the Problems

Several studies have associated web link analysis to improve productivity (especially in the area of research and scientific discoveries). Some of them show that there is a relationship between activities within the university and its link

level (Thelwall, 2002; Thanuskodi, 2012; Qiu, Chen, & Wang, 2004; Noruzi, 2005). Thelwall (2004) also acknowledged level linking as a valuable tool for tracing scholarly activities and patterns of information use in higher education. He maintained that such information can be beneficial in the planning and setting goals for ICT improvement in the affected organizations.

A few authors that have analysed the web presence of Nigerian universities have come up with some very interesting findings, but the fact remains that the potential of websites in Nigerian universities is not fully optimized. Nwagwu and Agarin (2008) concluded in their study that there is an overall low-level of utilization of the Web for sharing and spreading information. Also, poor organization and management of the websites was recorded. They attributed the low return of links by Nigerian universities to the fact that most users within the universities do not link through their main portal, and the problem had been associated with their size as they found that older and bigger organizations in most cases have a superior infrastructural and technological advantage than the littler and younger ones.

This study is intended to analyse selected Nigerian universities website in order to understand the linkage around them and also the accuracy of the link searches from these universities, Analysis will also focus on the frequency of in the link and out links of the Nigerian university websites. In pursuing this goal mentioned above, the research will be interested in finding out how Nigerian universities are utilising the benefits of web presence and networking among themselves and the rest of the world.

1.2. Objectives of the Research

The primary target of this study is to analyse the effectiveness of websites of some selected tertiary institutions in Yobe state, Nigeria using a webometric study approach.

Specific objective is: -

- To identify the different types of institutions in Yobe state and their web presence.
- To investigate the extent at which web presence of institutions in Yobe state be affected by the year in which the institution was founded
- Determine the search accuracy of the selected links.
- Make policy recommendation to enhance the web presence of selected links.

1.3. Research Questions

In order to carry out a thorough review of websites of some selected tertiary institutions in Yobe state and resolve the problems identified in the problem statement above, this research question was developed.

The primary target questions this research intends to answer is;

- Are Nigerian universities utilizing the benefit of web presence using URL citation and Title mention among themselves and the rest of the world?

2. Conceptual Framework

The growth of the metric sciences is revealed in the twentieth century. Informetrics, bibliometrics, scientometrics and lastly cybermetrics or webometrics. Of these, cybermetrics is latest and has been creating throughout the last few years. Publication of articles on the area has begun in full swing (Larson, R. 1996 and Rousseau, 1997) and electronic diary on the area has likewise developed on the internet (Almind,T.and Ingwersen, P. 1997). As article on the area is spilling in now and again, more current ideas are additionally developing.

The field of Webometric as an information science is '*the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the web drawing on bibliometric and informetric approaches*' (Bjorneborn and Ingwersen, 2004) or, in general, *'the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study'* (Thelwall, 2009). The previous definition stress the informetric legacy of numerous bibliometric techniques, the recent concentrates on the esteem that webometrics could give to the more extensive social sciences, reflecting a movement in webometrics about whether from more hypothetical studies to more practical studies. Webometrics is limited to the investigation of patterns of information creation, stockpiling, looking for, recovery, scattering and use in the web. The web, for this situation, is the Internet segment that uses content, pictures, and sound, video and document transfers to give information right to use through billions of website pages from far and wide.

Web and Metric were the two words that form the term webometric. The statement web is a short manifestation of World Wide Web. The science word reference characterized web as a hypermedia framework that permit customers to view and recover information from document`s holding connections. On the other hand, a measurement needs to do with counting or estimation. English Language Webster's Comprehensive Dictionary characterized measurements as the numerical hypothesis of estimation. The examination of the Web has been named as 'Webometrics' by (Almind and Ingwersen, 1997), in gratefulness that informetric dissection could be important to the web.

As far back mid-1990s the nature and properties of the World Wide Web have been more and more examined by connecting contemporary informetric methodologies. Webometrics is the new train that means to apply Bibliometrics, Scientometrics, Informetrics and Cybermetric strategies to the methodology of exploratory communication, which happens on Internet keeping in mind the end goal to know and portray them from a quantitative perspective. Webometrics, then, portrays counting or measuring web assets in numerical worth. It characterizes the degree of web utilization for research. Since the web permits reports to be joined together, the estimation of these link structures the

fabric of webometrics. Webometrics has been additionally defined as a web 'measured on the basis of web characteristics or presence on the Internet' by (NUC, 2006).

Webometrics along these lines rose to turn into a huge sound field inside information science, in any event from a bibliometric point of view (Astrom,F. 2007,Zhao,D. and Strotmann 2008) incorporating link analysis, web citation analysis and scope of other online quantitative strategies. Furthermore, webometrics got valuable indifferently applied background, for example, to develop the world webometrics ranking of universities (Aguillo,I.etal. 2006 and Thelwall M. 2010) and for scientometric assessments or examinations of collections of research or investigation areas (Li,X.etal., 2003). This research explores a small number of key areas of webometrics and abridges its contribution to Nigerian Universities.

2.1. Current Literature Focused Around the Relevant Variables of the Model or Theory

The growth of the Internet and the World Wide Web (web) have revolutionized not just insightful correspondence (albeit distributed on the web is yet to increase to the extent that as conventional exploratory distributed) additionally, the way in which establishments and people offer data concerning their administrations and items. Studies show that the Web is turning into a critical correspondence medium for science and scholarship (Cronin &Mckim, 1996). Schools of higher learning, and especially Universities, have grasped the web and its numerous peculiarities, empowering exercises, for example, the: procurement of online library indexes; advancement of the presence and accomplishments of people, exploration gatherings, Schools and departments; and the spread of research discoveries, either through facilitating online articles or distributed outlines, data sets or apparatuses (Noruzi, 2005). This situation has furnished researchers with extra devices with which they can or have effectively used to assess Universities. Accordingly, assessment of Universities, which was beforehand constrained to the utilization of bibliometric analysis (distributions tally, references examination and patent dissection),scholar's review (associate surveys), the monetary rate of return, careful investigations, overviews, the investigation of rivalry for funds, and a review investigation (e.g. The Time's Higher Education Supplement [2005]; ARWU: Shanghai Jiao Tong University [2004]; Cybermetrics Lab, 2005) can now be further conducted webometrically.

2.2. Current Literature Focused Around on Web Impact Report (W.I.R)

Numerous researchers are fascinating to explore the web impact of diverse ideas or records might in this manner profit from a web impact evaluation. The target may be to think about the impacts or backing of contending scholarly theories, political hopefuls or various comparable books. Now, here are some researchers conducted, considering research methodology, result, strength and weakness by some scholars.

Currently, the Web is seen as a vital wellspring of information with the focal point that the Internet prevails over geographic and different types of boundaries, despite the presence of technological boundaries (Thelwall, 2002). One of the first vast scale web studies was conducted by a Berkeley university group of researchers INKTOMI, which studied different aspects of web reports acquired by the INKTOMI crawler in 1995 (Larson, 1996). Their research analyzes the use of web tags and the developing use and quickly changing nature of the web. Their discovering additionally noted that notwithstanding the way that the utilization of the Web is developing to practically twofold its size in one month since 1995, the majority of the mainstream records found in the first pursuit had vanished by the second inquiry, a month later. This discovering affirms the unpredictable nature of the Web as a reports supply because once made the records can undoubtedly stop to exist inside a brief period.

Thelwall (2002) tackle the issue of the best metric for extracting information from the collection of web links concentrating on the best likely domain to count backlinks. Utilizing British universities, he figured WIFs from a few diverse source domains - .edu,.ac.uk and .uk domain and the whole web. His discoveries demonstrate that each of the four areas produces WIFs that associate strongly with research appraisals, yet that none delivers incontestably predominant figures. He likewise observed that WIF was less fit to separate in more homogenous subsets of universities even though positive results are still conceivable.

2.3. Current Literature Based On Link Impact Report (L.I.R)

The motivation behind link impact report is regularly to assess whether a given site has a high connection-based web impact contrasted with its companions. As a result of this statement, the following are some scholarly investigations on the area.

Notwithstanding, writers recognize that there are currently many link analysis examinations on university web sites. The application of informetric methodologies by library and information researchers to web related studies is developing progressively. Link analysis includes a dissection of the aggregate number of links to a site page, the link of the sites that are connecting to that page, the content utilized within the connections to that page and the subject of the page that links to that page. Link analysis implies that on the Web, elements are joined together, and one needs to know why, what and how of these associations. Websites links are possible indicators and generators of reliance (Davenport & Cronin; 2000) with a page that is the focus of numerously being more inclined to hold helpful information than one that is not (Thelwall, 2002). For Nigerian universities in this way, link analysis would mean inspecting the example of the connections with one another's sites and additionally with university and non- university organizations inside and outside Nigeria. The types of this linkage tell revealed many things about the actions of the universities.

Web analyses study earlier conducted on universities comprise research on the content and arrangement of web documents in 1995 (Bray, 1996). Bray experimentally pointed that the most noticeable documents in his sample of research comprises of homepages of recognized universities, organizations and companies while top growing sites were

dominated by web indexes example, that of Yahoo. However, He notices an irregular connectivity behaviour of the web, an investigation that Brooder et al. (2000) validated in their research of web pattern examine between May 1999 as well as October 1999 by means of two AltaVista crawls of more than 200 million pages plus 1.5 billion links. The research establishes that the Web is not as linked as thought before with merely about 28% of the web pages being 'strongly connected.' This result varies with that of Albert et al. (1999) in their study into the structure of Notre Dame University website, which summoned that in the entire web, the normal hyperlink-based distance among any two pages at random, was 19 reflecting a solid connectedness.

A considerable amount of studies has been led on links analysis to university websites. Qi, Chen, & Wang (2004) conduct studies on sites of 98 Chinese universities with the point of figuring out if backlinks tally and Web Impact Factor (WIF) of sites partner with the complete evaluations and the research appraisals for universities in Mainland China. By using different WIF count to total the site, the faculty members and the departments, their discoveries demonstrated that aggregate backlinks count and outside backlinks count has noteworthy correlation with universities rating particularly when utilizing the amount of universities/ department in computing the WIF. They argued that the strategy for using the aggregate total of sites in computing WIF does not fit universities with an excess of pages and excessively few pages while utilizing faculty WIF does not have noteworthy correlation with general evaluations and research rating of the universities studied.

Björneborn (2004) in his doctoral theory on little world link structures crosswise over scholar web space, considered data created from 109 UK universities. He developed a theoretical framework and observational strategies to recognize whether and how small- world phenomena develop in link structures over a scholastic web space and figure out what micro-structure exercises and components help the cohesiveness of the macro-structures over a scholarly web space. The discoveries demonstrated that UK scholastic sites indicated small- world properties with high-clustering coefficient and a low trademark way length of 3.5 between reachable sites. He further watched that computer science related sub-sites may be vital cross-topic connectors in a scholastic web space with something like 46% of sub-sites giving or getting transversal links in the study.

Tang and Thelwall (2003) in their investigation of pattern of linking to 89 US scholarly department from three areas of research (chemistry, psychology, and history) watched the regional difference amongst international in links and URL domain and difference between the extent of national and worldwide in links to more than 23 department from each one discipline. Their discoveries gave a noteworthy confirmation of a relationship between customary research productivity and online visibility, measured by universal in links to the US university departments while the examination of regional wellsprings of links to department demonstrated just a little variety by discipline. However, one area in which clear disciplinary contrast did develop was in the comparison of the extent of national to global links.

In attempting to comprehend why sites from distinctive scholarly subjects interlink, another research was conducted by Thelwall, Harries and Wilkinson (2003) which they took an example of 586-link sets of domain with diverse subjects, gathered by the kind of relationship between the source and target page. The study reveals more than a third of the links formed an academic connection between like subjects, yet in 8% of cases; different subjects additionally have an insightful connection. Likewise, higher education teaching links were seen to structure a broad cross-disciplinary network, representing 19% of links while 12% of links focused on non-subject particular general resources. The result proposes that mapping disciplinary coordinated effort on the Web ought to be attainable however that process and subject distinguishing proof in scholastic web would both be aided by the former evacuation of key higher education teaching and general mainstream general pages from the data set.

Different researchers have additionally analysed the relationship between totals links to a university's website and the focus on university's demonstrating the likelihood of correlation between linking example of a university and its academic productivity. Thelwall and Harries (2003), utilizing the United Kingdom as a careful investigation and measuring researchers' quality as far as university-wide average research appraisals, attempted to figure out if higher appraised researchers produce higher web effect sites. Their discoveries demonstrated that universities with higher appraised researchers deliver fundamentally more sites yet those sites just barely reflect a higher online effect measured from their domain alternative documents models (ADM) in link count up. This discovering reflects that there is no proof that higher rated researchers deliver essentially higher effect web content, just that they create more.

Additionally, in an alternate study, Thelwall (2004) inspected universities in UK, Australia and China and find that: 90% were associated somehow to academic exercises, yet that less than one percent was equal to formal citations. It was reasoned that counts of scholastic Web links will be blending a scope of transcendently academic issues yet don't concede a basic advocacy. These discoveries recommend, notwithstanding, that links may be a profitable potential wellspring of information about the academic utilization of the Web (Thelwall, 2004 p.127).

Harries et al. (2004) think over hyperlinks between academic sites, and observed that, in the same way as citations, web links can conceivably be utilized to chart disciplinary structures and distinguish confirmation of associations between disciplines. By means of three disciplines -Mathematics, Physics and Sociology, they look at that links inside a discipline were diverse in character to links between pages in distinctive disciplines.

An alternative study was conducted in Nigerian universities sites by (Nwagwu and Agarin 2008) utilizing an example of 1000 pages chooses from 30 of Nigerian 65 universities. The study uncovered that Nigerian universities sites interlink neither do they link academic websites exterior their country. Self-linking between the individual sites was discovered to be a predominant feature.

Onyancha and Ocholla (2007) led a study to examine between universities web connectivity at a regional level. Link analysis was utilized to distinguish Kenya and South African University sites performance. The study uncovers that

universities in South Africa have decently developed network, inter-connectivity between Kenyan Universities is few. Moreover, it was observed that all the links amongst Kenya and South African universities originate from the latter.

An alternate study that analysed site size appraisals of Google, Yahoo! furthermore MSN (now Bing) five Audit office sites with the scope of the individual crawler Nutch, discovering Nutch to give the most modest figures (Petricek et al., 2006).

Some investigation has likewise thought about the after effects of diverse internet searchers (Lewandowski, Wahlig, & Meyer-Bautor, 2006; Uyar, 2009a, 2009b), despite the fact that not for network diagram, however this was no more conceivable when Yahoo! turned into the main real internet searcher helpfully reporting hyperlink information.

One past study has endeavoured deliberately to analyse data sorts (Thelwall&Sud, 2011). This contrasted in links with sites with two different metrics: URL citations of the site and title mentions of the institution owning the site. The study discovered in link counts to associate altogether with URL citation checks and title mention means Yahoo! however discovered issues with a few sorts of hunt with Bing. No study has endeavoured anything comparable with connection or colink networks, nonetheless.

One past relative examination has used an alternate methodology to evaluate network data. It gathered co-in link data at two focuses in time utilizing the same strategies and contrasted the multidimensional scaling diagram delivered with them (Vaughan et al., 2009).

Different studies have analysed network, and multidimensional scaling outlines delivered within link data with that created by out link data (Heimeriks& van cave Besselaar, 2006), or have examined connection data in conjunction with delivered network with disconnected from the net related data (Heimeriks et al., 2003). The reason in both cases was to addition distinctive bits of knowledge into the sites researched, notwithstanding, instead of to survey the legitimacy of the diverse methodologies.

3. Methodology

3.1. Research Design

The general research design is to compare the results of the URL citation counts and Title mention counts total in-links as a web-based indicator to identify which types institutions in Yobe state are more presences on the web.

The first data set is a gathering of six (6) institutions in Yobe state, which stand for a set-up of large web sites. The second data set consist of three (3) Federal institutions and three (3) state owned institutions. For both the data sets a list of URL citation site in-link and Title mention site in-link will be created as the fundamental information required creating the searches. The approach utilized here is therefore to examine the results and propose the possible variation between metrics. Both URL citations and Title mentions result at this stage will be a text folder with a list of related title queries and URLs queries for all web sites. As suggested by Thelwall&Sud, (2011) these folders will be created in the easy Webometric Analyst (http://lexiurl.wlv.ac.uk).

3.2. Data Collection Methods and Analysis

Techniques of data gathering are an essential part of any research; incorrect data gathering can influence the outcome of the research and at last prompt invalid results. Quantitative technique of data gathering and analysis will be used in this study because once data is collected there is a need to organise, summarize and some exploratory analysis and to communicate the meaning to others by presenting data as a table, graphical presentations and summary statistics, examine where reaction are comparable and difference amongst what the research investigates.

The search will be limited to HTML page (Hyper Text Mark-up Language) only. Since HTML is the device that gives the main medium for connecting on the web. The following command will be used to recover the entire links page of the website. Link: www.xxx.yyy.zz with the composition 'www' indicating the world wide web, 'xxx'indicating the domain name of the institution (example for the Umar Suleiman College of Education, Gashua), 'yyy'indicates the sub-top-level domain (example .edu) while 'zz' indicates the top-level domain (example .ng).

Webometric Analyst will be used in this study because it is a remarkable programming tool design to extract quantitative data from web. This instrument utilized Google Application Programming Interface (API) to haul out all return's URLs (sub-domains) easily to the hard disk which will be important for further study. The search engine was chosen to answer research questions based on its correctness contrasted with other web search tools.

S/No	Institutions	Type	Website Address
1	Federal University Gashua	Federal	http://www.fugashua.edu.ng
2	The Federal Polytechnic Damaturu	Federal	http://www.fedpodam.edu.ng
3	Federal College of Education (Technical) Potiskum	Federal	http://www.fcetpostiskum.edu.ng
4	Yobe State University Damaturu	State	http://www.ysu.edu.ng
5	Mai IdrissAlooma Polytechnic Geidam	State	http://www.miapoly.edu.ng
6	Umar Suleiman College of Education Gashua	State	http://www.uscoega.edu.ng

Table 1: List of Some Selected TeratiaryInstituions in Yobe State, Types, and Their Web Address

4. Results

S/No	Institutions	Count
1	Federal University Gashua	1720
2	The Federal Polytechnic Damaturu	363
3	Federal College of Education (Technical) Potiskum	116
4	Yobe State University Damaturu	2650
5	Mai IdrissAlooma Polytechnic Geidam	243
6	Umar Suleiman College of Education Gashua	79400

Table 2: URL Citation Site In-Link Results

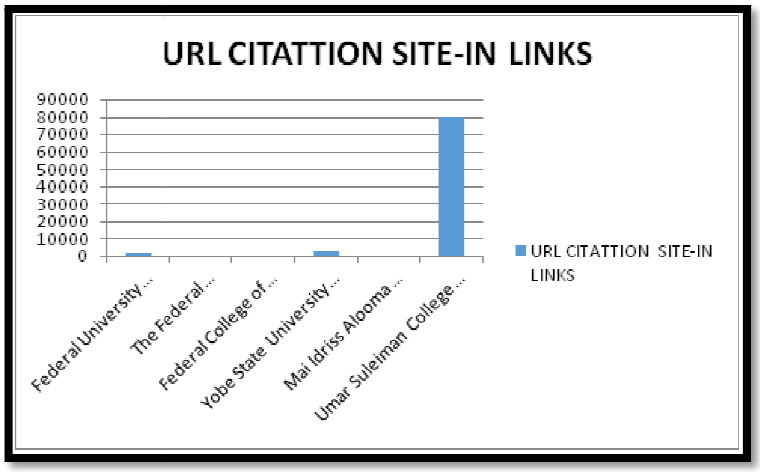

Figure 1: URL Citattion Site-In Links

The URL citation site in-link chart shows that UmarSuleiman College of Education GashuaYobe state has the highest number of matched URL followed by the Yobe State University Damaturu then Federal University Gashua, Federal Polytechnic Damaturu, Mai IdrissAlooma Polytechnic Geidam while Federal College of Education (technical) Potiskum is the least in all ratification that was omitted due to different problems that may be as a result of server down on the day of the study.

S/No	Institutions	Count
1	Federal University Gashua	193000
2	The Federal Polytechnic Damaturu	28500
3	Federal College of Education (Technical) Potiskum	7800
4	Yobe State University Damaturu	644000
5	Mai IdrissAlooma Polytechnic Geidam	5800
6	Umar Suleiman College of Education Gashua	110000

Table 3: Title Mention Site In-Link Results

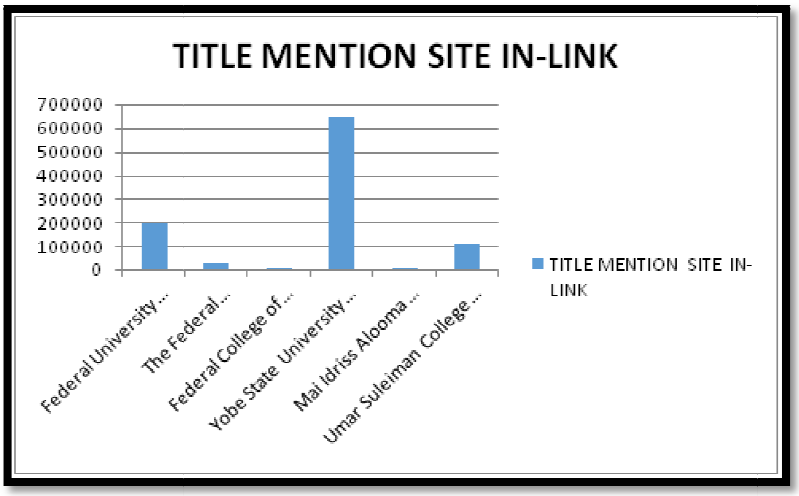

Figure 2: Title Mention Site In-Link

Based on the observed result, finding showed that the highest number of in-link to the institutions in Yobe State using Title Mention was Yobe State University, which received significantly high number of matched URL, and also has having highest sites in-link, Federal University Gashua being the second on the results, then Umar Suleiman College of Education Gashua, Federal Polytechnic Damaturu, FCE(T) Potiskum in which Mai IdrisAlooma Polytechnic Geidam is the least.

5. Summary of the Findings

The primary target of this study is to analyse the effectiveness of websites of some selected tertiary institution in Yobe state using a webometric study approach. The study examines and explores through a webometric study considering the websites of the institutions

This research was conducted on the Webometric analysis of institutions in Yobe state in which link Analysis was used to analyse the results using the total number of in-links as a web-based indicator to identify which types of institutions are more presences on the web. Two webometric results return from Googlei.e., URL citation and Title Mention were compared.

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