

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

January 2020

Citation Analysis of Projects Submitted to the Library from three Departments in a Nigerian Specialized University

Ijiekhuamhen Osaze Patrick

Federal University of Petroleum Resources Effurun, sazepatrick@gmail.com

Enite Anita Okotie

Federal University of Petroleum Resources, Effurun, Urhefe.enite@fupre.edu.ng

Arapasopo Esther Arinola

Samuel Adegboyega University, Ogwa, Edo State, Earapasopo2016@yahoo.com

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#)

Patrick, Ijiekhuamhen Osaze; Okotie, Enite Anita; and Arinola, Arapasopo Esther, "Citation Analysis of Projects Submitted to the Library from three Departments in a Nigerian Specialized University" (2020).

Library Philosophy and Practice (e-journal). 3947.

<https://digitalcommons.unl.edu/libphilprac/3947>

Citation Analysis of Projects Submitted to the Library from three Departments in a Nigerian Specialized University

By

Osaze Patrick Ijiekhuamhen (CLN)

Library Department, Federal University of Petroleum Resources, Effurun, Delta State
Sazepatrick@gmail.com; +2347054478632

Enite Anita Okotie (CLN)

Library Department, Federal University of Petroleum Resources, Effurun, Delta State
Urhefe.enite@fupre.edu.ng; +2347069731683

And

Arapasopo Esther Arinola (CLN)

Technical Service Department, Samuel Adegboyega University, Ogwa, Edo State
Earapasopo2016@yahoo.com; 09076045314

ABSTRACT

The study evaluated the projects submitted to the library from Chemistry Department, Environmental Science and Toxicology and Physics Department of Federal University of Petroleum Resources, Effurun, Delta State. The research method adopted for this study was citation analysis. A total of 348 projects were submitted to the library from departments understudy from 2015-2017. The findings showed that that physics department had the highest number of project reports submitted and highest number of citations while Chemistry department had the lowest number of citations. The study revealed that Internet/ Web Resources had the highest citations with 4446 citations, followed by Journals with 4224 citations, Books had 2699 citations. It was observed from the study that “Highly Recent” citations of 4326 were cited by the three (3) departments from 2013-2017, followed by 2854 citations that were “Very Recent” cited between 2008-2012, among others. Lastly, the study showed that between the year 2015-2017, 7407 citations were made by foreign authors, while 4930 citations were made by Nigerian authors. It was recommended from the study that materials should be built on frequently cited and recent information resources in Chemistry, Environmental and Toxicology Sciences and Physics Departments and current update to date books and journals should be acquired to reduce over reliance on internet/ web resources.

Keywords: Citation Analysis; Physics, Environmental Science and Toxicology; Chemistry; Projects; FUPRE; Nigeria

INTRODUCTION

Bibliometrics is a major research area in library and information science that has basic laws and principles that guides its practical application. Alan Pritchard who is popularly regarded as one of the founding fathers of bibliometrics introduced the term “bibliometrics” in 1969 as "the application of mathematics and statistical methods to books and other media of communications” (Pritchard, 1969, p. 349). Bibliometrics involves statistical/ mathematical measurement of research output, recency of citation, scientific growth indicators, journal selection, predicting a field’s potential, and factors that encourages a researcher to cite a particular publication or author. Similarly, Zafrunnisha (2012) affirmed that bibliometric approaches can be employed to satisfy various objectives including, assessment of research output, developing scientific indicators, journal selection and predicting a field’s potential. Citation analysis is one key research area in the field study of bibliometrics.

However, citations in research are used to establish links to other scholarly works that are related to a present study. Research work cited in another research work goes a long way to show that the two research studies are bibliographically coupled. More so, Editage Insights (2013) opined that “earlier, scientists would simply consider the number of papers they had published as a measure of their academic standing, today, the focus is increasingly shifting from whether a researcher has published a paper to where he/she has published it and the impact that piece of research has on the scientific community and the world at large". “Citation analysis can be defined as a branch of bibliometrics that examines the citations found in publications such as journal articles and books to look for patterns of use” (Hoffmann & Doucette, 2012, p. 321). Moreso, Fasaie (2018) posited that citation analysis is the examination of the frequency, patterns, and graphs of citations in documents. It uses the pattern of citations, links from one document to another document, to reveal properties of the documents. Citation analysis are useful measurement tool for understanding subject relationship, authors impact, publication growth/ impact, and the preferred source cited by researchers in a given field of study (Gohain & Saikia, 2014; Fasaie, 2018). In today’s academic world, citation counts, recency of citations, integrity of authors cited, impact factor of journal and integrity of the publisher are some of the major criteria used to appraise the scholarly inputs of authors and academic journals in this information age.

Librarians in university libraries are increasingly carrying out studies on citation analysis of their resources to be able to ascertain the number of citation per information resource, the number of

indigenous and foreign authors cited in a particular publication, the information source preference by researchers in a given field and the recency of citations in a publication to mention but a few and the results of such studies has assisted in policy making, enhanced collection development and strategic decision making. This present study focuses on citation analysis of projects submitted to the library from department of Chemistry, Environmental and Toxicology Sciences and Physics of Federal University of Petroleum Resources, Effurun (FUPRE). Currently, this is the first citation analysis study conducted in FUPRE Library since inception. This research will serve as reference to future researchers conducting studies on citation analysis in university libraries.

BACKGROUND INFORMATION OF FEDERAL UNIVERSITY OF PETROLEUM RESOURCE, EFFURUN (FUPRE)

The Federal University of Petroleum Resources, Effurun (FUPRE), Delta State, Nigeria was established in March 2007, under a Federal government of Nigeria initiative to establish a specialized University to produce a unique high level manpower and relevant expertise for the oil and gas sector in Nigeria and worldwide. As a specialized University for the petroleum and allied sector, it is the first in Africa and destined to be the premier international institution-of-choice with the state-of-the-art facilities to provide the petroleum and allied sectors world class education, training, research, consultancy and extension service (Federal University of Petroleum Resources Effurun, 2017). The university library has continually played a major role in ensuring FUPRE meet the teaching, learning, research and recreational needs of its academic community.

The University Library currently serves the constituent colleges of the university which are the College of science and College of Technology by establishing satellite libraries in both colleges aside the central Library that is being housed in a temporary site. FUPRE Library serves as depository point for projects in the institution as a final copy of project is sent to the library upon graduation of a student from all the departments. So far, FUPRE library has received projects from the departments from 2015 – 2017. This study focuses on projects received from Chemistry, Environmental and Toxicology Sciences and Physics departments of Federal University of Petroleum Resources, Effurun. Federal University of Petroleum Resources, Effurun has a policy regarding citations. Students are not allowed to cite sources without date, so all the citations in the projects have a date of publication.

OBJECTIVES OF THE STUDY

The following objectives were formulated to guide the study:

- ✓ To find out the numbers of citation of each department per year
- ✓ To examine citation made according to the types of information sources
- ✓ To determine the recency of information materials cited
- ✓ To find out the types of authorship cited in the projects

RESEARCH QUESTIONS

The following questions will be answered in the study:

- ✓ What is the number of citations of each department per year?
- ✓ What are the citations made according to the types of information materials?
- ✓ What is the recency of information materials cited?
- ✓ What are the types of authorship cited in the projects?

LITERATURE REVIEW

Citation analysis is a branch of bibliometrics that examines the linkages between cited articles. This is used as a quantitative measure of impact, influence or quality (Curtin University Library, 2018). The quality of a research work can largely be determined by the level of citation in it. In academia new knowledge is a vital proof of advancement and this can only exist when there has been a synthesis of a new idea with existing established knowledge (Iroaganachi, Itsekor, & Osinulu, 2014). In the literature, a citation has been regarded as a signpost and an acknowledgement. As a signpost, it signals the location of your source. As an acknowledgement, it reveals that you are indebted to that source. Apart from these, it shows the credibility of a work especially if the cited author is vastly knowledgeable in the field (Hunter, 2006; Iroaganachi, Itsekor, & Osinulu, 2014).

There are a lot of studies on citation analysis of projects submitted to libraries by foreign authors with a few corresponding studies conducted in Nigeria. However, Iroaganachi, Itsekor and Osinulu (2014) studied citation analysis of social science research: A case study of Bachelor Degree research Project reports of a Nigerian University 2009-2013. The study revealed that the department of Marketing had the highest mean score of citation per project report which is 50 citations. This was followed by

Accounting with 48 Citations, then Business Administration and International Relations had an average of 46 citations respectively. The least average citation per report was that of Political science 27 which may not be considered as being low as there is no approved standard in literature for measurement. Similarly, Fasae (2018) studied Citation analysis of M.Tech theses submitted in the Department of Agricultural Economics and Extension, Federal University of Technology Akure, Nigeria. The findings of the study revealed that the highest citation was recorded in 2006, while 30.52 per cent of materials cited were 20 years old and above. However, Felicia and Emmanuel (2017) studied Citation Analysis of Undergraduate Research Projects: A Case Study of the College of Agricultural Sciences, Landmark University, Omu Aran, Kwara State. The findings of the study revealed prevalence of the citations was from the Animal Science programme with 5,638 citations. Agricultural Economics had the lowest citation, 348. This is expected as there were only few students who graduated from the programme.

Similarly, Olatokun and Makinde (2009) studied citation analysis of dissertations submitted to the department of Animal science, university of Ibadan, Nigeria. The findings of the study revealed that journal was the most cited information source over the years of study, followed by books, conference materials, government documents, technical reports and standards and web resources also followed in this order as the least cited information source. In a study by Fasae(2018) on citation analysis of projects submitted to the Department of Chemistry and Petroleum Engineering of Afe Babalola University, Ado-Ekiti, Nigeria. The study revealed that information materials mostly cited by students were journals followed by books and Seminar/Conference Proceedings. Edzan (2007) worked on the paper that analysis bibliography of final year project reports emanating from the Faculty of Computer Science and Information Technology, University of Malaya. A total of 73 reports were analyzed using a pre-designed scoring sheet and results presented included number of pages, number of citations, types of sources used, usage of Web resources, currency of sources and citation style. The findings revealed that there are more Web citations than citations to books, journal articles, undergraduate reports, Masters' dissertations and conference papers. Also, Okoye and Okoye (2017) study on the citation analysis of the undergraduate degree projects submitted to the Department of Library and Information Science at Madonna University in Nigeria from 2009 to 2014, indicated that books are most highly cited and that major subject coverage in the degree projects reflects students' interest in employment after graduation.

The study of Iroaganachi, Itsekor and Osinulu (2014) shows that citations that falls within the year 2009-2013 are regarded as very recent, 2003-2008 as recent, 1995-2002 not very recent while citations from 1990 and below are classified as not recent. The findings revealed that 27,714 (34.6%) of the total citations were Very Recent, 16, 820 (21%) citations were Recent, while 10,733 (13.4%) citations were Not Very Recent. 24,830 (31%) of the total citations were Not Recent. 34.6% is not a pass mark in any examination therefore, citation of very recent materials amongst the researchers is poor. Similarly, Felicia and Emmanuel (2017) study revealed that citations that fall within 2016 and above were classified as Very Highly Recent, 2011-2015 Very Recent, 2006-2010 Recent, 2001-2005 Not Very Recent, while 2000 and below were considered Not Recent. 659 (5%) of the total citations were Very Highly Recent, 3,182 (24.1%) as Very Recent, 2,784 (21.1%) Recent, 2,807 (21.4%) Not Very Recent while the largest number, 3,748 (28.4%) were Not Recent. The Not Recent category appears to be most prevalent. This is not a good omen for research. One of the major assessments of a good research is the recency of the materials cited.

Consequently, in a study by Simisaye and Osinaike (2010) on citation analysis of journal of library and information science from (2004-2009). The findings of the study revealed that the 62 library and information science journals generated 172 citations in the journal. Out of this, journals from Nigeria accounted for the highest share of the citations (104) representing (60.46%), journals outside the shore of Africa accounted for 66 citations (38.37%) while journals from other two African countries have just (2) citations (1.1%). Conclusively, Sharif and Manhood (2004) studied how economists cite literature: citation analysis of two core Pakistani economic journals. The findings of the study revealed that most of the authors used foreign books as citations. There is a significant similarity in the top most cited journals in both cases. Most of the frequently cited journals were from the USA.

RESEARCH METHODOLOGY

The research method adopted for this study was citation analysis. Citations documented as references were extracted and analyzed in relationship to the objectives of the study. A total of 348 projects were submitted to the library from department of Chemistry, Environmental and Toxicology sciences and Physic of Federal University of Petroleum Resources, Effurun, Nigeria from 2015-2017. The total number of projects (348) yielded a citation count of 12,337. The data collection was done within a period of 4 months. The data collected were analyzed using descriptive statistics. The major abbreviation used in the study was NOC which stands for Number of Citations.

RESEARCH FINDINGS AND DISCUSSION

A total of Twelve Thousand, Three Hundred and Thirty Seven (12, 337) Citations were generated from the Three Hundred and Forty Eight (348) Projects submitted from the department of Chemistry, Environmental and Toxicology sciences and Physic of Federal University of Petroleum Resources, Effurun, Nigeria.

Table 1: Submission of Project Reports per Year by Graduating Class

DEPARTMENTS	YEARS			TOTAL
	2015	2016	2017	
Chemistry Department	43	23	10	76
Environmental Science and Toxicology	52	61	33	146
Physics	31	57	38	126
Total	126	141	81	348
Percentage	36.20%	40.51%	23.27%	

Table 1 above shows the project reports submitted by graduating students from 2015-2017. It was revealed that a total of 348 projects were submitted between 2015-2017. Chemistry department had a total of 76 projects, Environmental Science and Toxicology had 146 projects while Physics department had 128 projects.

Table 2: No of Projects/ Citations of Each Department per Year

DEPARTMENTS	YEARS/ No of Citation (NOC)			TOTAL
	2015(NOC)	2016(NOC)	2017(NOC)	
Chemistry Department	43(1679)	23(976)	10(247)	76(2902)
Environmental Science and Toxicology	52(1912)	61(2150)	33(1115)	146(5177)
Physics	31(998)	57(1967)	38(1293)	126(4258)
Total	126(4589)	141(5093)	81(2655)	348(12337)

Table 2 revealed the number of citations each department project report generated according to year. The 76 projects of Chemistry department from 2015-2017 generated a total citation of 2902. The 146 projects of Environmental Science and Toxicology department from 2015-2017 generated a total citation of 5177, and the 126 projects of Physics department from 2015-2017 generated a total

citation of 4258. It is glaring that physics department had the highest number of project reports submitted and highest number of citations while Chemistry department had the lowest number of citations. The cumulative number of citations of the three departments from 2015-2017 is 12,337 citations.

Table 3: General citation of the three years according to information source cited

Information Source	Chemistry Department	Environmental Science and Toxicology	Physics	Total
Books	1213	899	587	2699
Journals	781	2219	1224	4224
Internet/ Web Resources	521	1614	2311	4446
Newspapers	7	-		7
Reports	-	-	9	9
Government Document	-	-	-	-
Seminar/ Conference Proceedings	83	22	72	177
Projects/ Theses	211	345		556
Lecture Notes	8	15	44	67
Manuscripts	19	49		68
Bulletins	-	-	-	-
Magazines	59	14	11	84
Total	2902	5177	4258	12337

Table 3 above shows citation made according to the types of information source cited in the project reports. Internet/ Web Resources had the highest citations with 4446 citations, followed by Journals with 4224 citations, Books had 2699 citations, Projects/ Theses had 556 citations, Magazines had 84 citations, and manuscripts had 68 citations. Reports and Newspapers had 9 and 7 citations respectively. It is clear that Government Documents and Bulletins had no citations. This findings agrees with the study of Edzan (2007) on the paper that analysis bibliography of final year project reports emanating from the Faculty of Computer Science and Information Technology, University of Malaya which revealed that there were more Web citations than citations to books, journal articles, undergraduate reports, Masters’ dissertations and conference papers.

Table 4: Recency of citations in each department

Year	Recency	Chemistry Department	Environmental Science and Toxicology	Physics	Total
2013 - 2017	Highly Recent	1037	1977	1312	4326
2008 - 2012	Very Recent	725	1289	840	2854
2003 - 2007	Recent	419	1145	412	1976
1998 - 2002	Not Highly Recent	197	446	754	1397
1993 - 1997	Not Very Recent	78	213	219	510
Before 1992	Not Recent	446	107	721	1274
Total		2902	5177	4258	12337

It was observed from **Table 4** that “Highly Recent” citations of 4326 were cited by the three (3) departments from 2013-2017, followed by 2854 citations that were “Very Recent” cited between 2008-2012, while 1976 citations that were “Recent” cited between 2003-2007, 1397 “Not Highly Recent” citations between 1998-2002, 510 citations that were “Not Very Recent” cited between 1993-1997 and lastly, 1274 citations that were “Not Recent” cited before 1992. This finding disagrees with the study of Felicia and Emmanuel (2017) which revealed that the Not Recent category appears to be most prevalent. In the present study most of the citations falls under Highly Recent- Recent category.

Table 5: Types of Authorship Cited

Year	Nigerian Authors			Total	Foreign Authors			Total	Grand Total
	Chemistry Department	Environmental Science and Toxicology	Physics		Chemistry Department	Environmental Science and Toxicology	Physics		
2015	722	897	411	2030	957	1015	587	2559	4589
2016	377	693	832	1902	599	1457	1135	3191	5093
2017	84	415	499	998	163	700	794	1657	2655
Total	1183	2005	1742	4930	1719	3172	2516	7407	12337

Table 5 shows the types of author cited in the project report by the three departments submitted to the library. Between the year 2015-2017 under study, 7407 citations were made by foreign authors, while 4930 citations were made by Nigerian authors. This finding agrees with the study of Sharif and Manhood (2004) on how economists cite literature which revealed that most of the authors used foreign books as citations than local ones. Also, this finding disagrees with the study of Simisaye and Osinaike (2010) on citation analysis of journal of library and information science from (2004-2009) which revealed that Nigeria accounted for the highest share of the citations (104) representing (60.46%) of the total citations.

SUMMARY OF KEY FINDINGS OF THE STUDY

The key findings of the study are summarized below:

- ✓ There were 348 projects submitted between 2015-2017 from the department of Chemistry, Environmental Science and Toxicology and Physics.
- ✓ It is glaring from the study that physics department had the highest number of project reports submitted and highest number of citations while Chemistry department had the lowest number of citations.
- ✓ The study revealed that Internet/ Web Resources had the highest citations with 4446 citations, followed by Journals with 4224 citations, Books had 2699 citations. It is clear from the study that Government Documents and Bulletins had no citations.
- ✓ It was observed from the study that “Highly Recent” citations of 4326 were cited by the three (3) departments from 2013-2017, followed by 2854 citations that were “Very Recent” cited between 2008-2012, while 1976 citations that were “Recent” cited between 2003-2007, 1397 “Not Highly Recent” citations between 1998-2002, 510 citations that were “Not Very Recent” cited between 1993-1997 and lastly, 1274 citations that were “Not Recent” cited before 1992.
- ✓ The study showed that between the year 2015-2017, 7407 citations were made by foreign authors, while 4930 citations were made by Nigerian authors.

CONCLUSION

Citation Analysis helps in accessing the quality of undergraduate projects by assessing the number of citations, the recency of the citations, students preference to local or foreign authors when undertaken research and much more. The study evaluated the projects submitted to the library from Chemistry, Environmental and Toxicology Sciences and Physics Department of Federal University of Petroleum Resources, Effurun. The study takes a critical look at the number of citation of each department per year, the citation made according to the types of information sources, the recency of information materials cited and the types of authorship cited in the projects.

The study revealed that 348 projects were submitted between 2015-2017 from the department of Chemistry, Environmental Science and Toxicology and Physics. It was glaring from the study that internet/ web resources were the most cited information sources and this finding contradicted other studies carried out in Nigeria which showed that journals were the most cited information source by

undergraduates. The study revealed that the undergraduates rely mainly on recent information sources when writing their project report than outdated information sources. This goes a long way to show the high quality of projects coming out from the departments under review. The study makes it clear from the undergraduate project report analyzed that there is much reliance on foreign authors than Nigerian authors when carrying out research. This heavy reliance on foreign authors could be largely attributed to few Nigerian authors in the fields under study as well as available collections in the library as bulk of the collections built in most university libraries in Nigeria are mainly of foreign authors than home based authors in the various fields.

The present study has given enough insights on the factors to consider when building collections for undergraduates as well as the quality of the project reports emanating from Federal University of Petroleum Resources, Effurun.

RECOMMENDATIONS

Based on the findings, the following recommendations were made;

- Materials should be built on frequently cited and recent information resources in Chemistry, Environmental and Toxicology Sciences and Physics Departments.
- Current update to date books and journals should be acquired to reduce over reliance on internet/ web resources.
- Universities should adopt the policy of discouraging students from citing information sources without date of publication and other bibliographic information required for citation and referencing.
- Librarians and supervisors should guide students and other researchers on citation and referencing to improve on their quality of writing.
- Librarians should teach undergraduates on how to evaluate information sources online in order to select only the credible ones and weed out the jargons.
- Most citation analysis studies should be conducted on the projects submitted by other departments of Federal University of Petroleum Resources, Effurun.

REFERENCES

- Curtin University Library. (2018). *What is citation analysis*. Retrieved from <http://libguides.library.curtin.edu.au/c.php?g=202403&p=1332777>
- Editage Insights. (2013). *Using citation analysis to measure research impact*. Retrieved from <https://www.editage.com/insights/using-citation-analysis-to-measure-research-impact>
- Edzan, N.N. (2017). Tracing information literacy of computer science undergraduates: A content analysis of students' academic exercise. *Malaysian Journal of Library & Information Science*, 12(1), 97-109.
- Fasae, J.K. (2018). Citation analysis of projects submitted to the department of Chemistry and Petroleum Engineering of Afe Babalola University, Ado-Ekiti, Nigeria. *Library Philosophy and Practice (e-journal)*. Paper 1775. Retrieved from <https://digitalcommons.unl.edu/libphilprac/1775>
- Federal University of Petroleum Resources Effurun. (2017). *About us/ History*. Retrieved from <http://fupre.edu.ng/s/?fupre=page&id=3>
- Felicia, Y., & Emmanuel, O.S. (2017). Citation Analysis of Undergraduate Research Projects: A Case Study of the College of Agricultural Sciences, Landmark University, Omu Aran, Kwara State. *Journal of Applied Information Science and Technology*, 10(3), 18-23.
- Gohain, A., & Saikia, M. (2014). Citation analysis of Ph.D theses submitted to the department of chemical sciences, Tezpur University, ASSAM. *Library Philosophy and Practice (e-journal)*. Retrieved from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2641&context=libphilprac>
- Hoffmann, K., & Doucette, L. (2012). A review of citation analysis methodologies for collection management. *College & Research Libraries*, 73(4), 321-335. doi : 10.5860/crl-254 .
- Hunter, J. (2006). *The importance of citation*. Retrieved from <http://web.grinnell.edu/Dean/Tutorial/EUS/IC>.
- Iroaganachi, M.A., Itsekor, V., & Osinulu, I. (2014). Citation analysis of social science research: A case study of Bachelor Degree Research Project Reports of a Nigerian University 2009-2013. *Library Philosophy and Practice (e-journal)*. 1096. Retrieved from <http://digitalcommons.unl.edu/libphilprac/1096>
- Okoye, M. O., & Okoye, N. C. (2017). Citation analysis of library and information science degree projects accepted at Madonna University, Okija, Nigeria. *Chinese Librarianship: an International Electronic Journal*, 44, 33-50.
- Olatokun, W.M., & Makinde, O. (2009). Citation analysis of dissertations submitted to the Department of Animal Science, University of Ibadan, Nigeria. *Annals of Library and Information Science*, 56, 117-128.
- Pritchard, A. (1969). Statistical bibliography or bibliometrics. *Journal of Documentation*, 25(4), 348-349.

- Sharif, A., & Mahmood, K. (2004). How economists cite literature: Citation analysis of two core Pakistani economic journals. *Collection Building*, 23(4), 172-176.
- Simisaye, A.O., & Osinaike, A.B. (2010). Citation analysis of journal of library and information science (2004-2009). *Brazilian Journal of Information Science: Research Trends*, 4(1). Retrieved from <https://doi.org/10.5016/brajis.v4i1.482>
- Texas A&M University Libraries. (2017). *Guide to citation analysis*. Retrieved from <http://tamu.libguides.com/c.php?g=565010&p=3891782>
- Zafrunnisha, N. (2012). Citations in the sociology doctoral dissertations: A quantitative analysis. *International Journal of Information Dissemination and Technology*, 2(3), 212-218. Retrieved from <http://ijdt.com/index.php/ijdt/article/download/100/100>