

CITATION ANALYSIS OF R & D ARTICLES OF VICARP RESEARCHES

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ABSTRACT

The paper presents the citation sources of VICARP researchers' published articles in refereed journals and other publications. A total of 90 sample published articles composed of 30 samples each from peer-reviewed journals, "non-refereed journals" and other R&D publications were subjected to citation analysis.

Authored by 151 researchers, the entire 90 sample articles had a total of 881 citation sources. About one-half (50.5%) of the reference materials cited in the sample articles came from gray literatures. About one-fourth (27.1%) were citations from books. Only about a fourth (22.4%) were taken from refereed journals. Among the gray literatures used by the researchers were conference proceedings, theses, bulletins/newsletters, monographs, terminal reports, manuals, abstracts, working papers, annual reports, and other non-refereed publications.

KEY WORDS: Citation analysis. Research publishing. Gray literature. Literature cited. VICARP researchers.

INTRODUCTION

Citation analysis is considered as an important evaluative tool. It has been used to determine the literature foundations of science and the impact of particular papers (Ryu, 1989). Diadoto (1994) defines citation analysis as a wide ranging area of bibliometrics that studies the citations to and from documents. Such studies may focus on the documents themselves or on such matters as their authors and the journals (if the documents are journal articles) in which the articles appear.

Strohl (1999) said that in citation checking, a sample of citations from textbook bibliographies, journal articles, student dissertations or other sources are checked against holdings to see what proportion is owned. As a bibliographic representation, citation analysis serves as a counting technique that reflects linkages between scientific papers, technical notes, reviews and other forms of written communication. The citation links provide a quantitative picture of journal usage and relationships of journals whose primary function is to communicate research results. It provides results on the form, structure, and volume of scientific communication, thus giving additional knowledge about the conditions and patterns of scientific activity and research.

According to Bieber and Jacoby (2002), citation analysis is useful for several reasons. First, the researcher can find out how much impact a particular article has had by showing which other authors based some work upon it or cited it as an example within their own papers. Second, it aids in determining more about a field or topic. Third, it helps in finding out how much impact a particular author has had.

The International Encyclopedia of Social Science accounts the observation of Gilbert (1977) that scientific papers must be viewed as "tools of persuasion", not as property. Citations are thus used as aids which increase an author's power to persuade. So, if citations aid in

persuading, only those works which are likely to be most effective in this function must be used.

Citation analysis is an excellent unobtrusive method in determining which resources researchers are using. According to Buchanan and Herubel (1994), regular in-house collection evaluation enhances the management of collections in any research library's public service and collection development efforts for short and long term objectives.

In a citation analysis of Chemistry Doctoral Dissertations at the Ohio State University (Gooden, 2004), the 30 dissertations studied generated a total of 3,704 citations. Journal articles were cited more frequently than monographs; 85.8% of the citations were journal articles and 8.4% of the citations were monographs. Result of the study was used to assist OSU and other universities in chemistry collection development.

However, in the Philippines and probably elsewhere in the Third World, the issue of gray literature is a topic of concern. The information commonly used in publications and workshops are largely from gray literature, not from journal publications. Briefly, gray literatures are publications produced without adequate peer review. Examples are conference proceedings, institutional reports, and papers not obtainable via normal library channels. The use of non-refereed information in development and management projects has become common practice. Reliance on gray literature is also prevalent in the publication of research results. The practice is contrary to the appropriate mechanism for communicating scientific results, which is in peer-reviewed publications.

Despite calls to reduce the production and use of gray literature, the practice continues to proliferate in the publication of research results. The integrity and quality of the publication depend on the quality of the bibliography added to it. Poor bibliographies contribute to the propagation of errors which are not easy to detect and correct. If gray literatures lack

credibility and avoiding peer-review can be dangerous for the scientist and the discipline, then such practices are jeopardizing the incorporation of knowledge into policy and management decisions.

METHODOLOGY

Articles written by researchers in agencies under the Visayas Consortium for Agriculture and Resources Program (VICARP) published in refereed journals and other publications were examined. VICARP spearheads the conduct of research and development activities in the Eastern Visayas region (Region VIII), Philippines. The consortium has 17 member-agencies composed of state colleges and universities, government line agencies and local government units.

This study was limited to published articles reported by respondents in the questionnaire used in a survey of researchers' attitude toward and performance in research publishing. A total of 90 sample published articles were analyzed: 30 samples from peer-reviewed journals, 30 from non-refereed journals, and 30 from other R&D publications. The number of articles obtained from various VICARP member-agencies is presented in Table 1.

In this study, the gray literature was defined as any publication produced without adequate peer review. The gray literature category consisted of proceedings, theses, bulletins/newsletters, monographs, terminal reports, manuals, abstracts, working papers, annual reports and others (newspapers, handouts).

A codebook was used in the citation analysis. Reference citations of each sample article were coded and grouped into three categories: journals, books and gray literature.

Table 1. Number of articles obtained from each VICARP-member agencies.

Agency	Number of Articles
Leyte State University Visca, Baybay, Leyte	29
University of Eastern Philippines Catarman, Northern Samar	16
Department of Environment and Natural Resources, Region VIII, Tacloban City	14
Eastern Samar State University Borongan, Eastern Samar	11
Department of Agriculture Region VIII Tacloban City	7
Tiburcio Tancinco Memorial Institute of Science and Technology , Calbayog City	7
Eastern Visayas State University Tacloban City	4
Samar State University Catbalogan, Samar	1
Southern Leyte State University Sogod, Southern Leyte	1

RESULTS AND DISCUSSION

Sources of Articles

One-third (33.3%) of the references was taken from "non-refereed journals" which were common in other member-SUCs of the consortium; "non-refereed journals" are local journal publications that are not peer reviewed (Table 2). Other sources were taken from terminal reports (31.1%), national journals (22.2%), international journals (11.1%), books (1.1%) and proceedings (2.2%).

Table 2. Publication sources of sample articles.

Source	Frequency	Percent
"Non-refereed Journal	30	33.3
Terminal Report	28	31.1
National Journal	20	22.2
International Journal	10	11.1
Book	1	1.1
Proceedings	1	1.1
TOTAL	90	100.0

Reference Citations

From the entire 90 sample articles, there were a total of 881 citation sources. The number of materials used in the sample articles ranged from 1 to 46 with a mean of 9.18. Most of the articles had 6-10 references (40.0%). More than one-third (35.6%) had 1-5 references cited. Only few articles had numerous citation sources: 11-15 (10%), 16-20 (6.7%) and 21-46 (7.7%). Table 3 shows the distribution of number of reference citations of the sample articles.

Table 3. Number of reference/citation sources.

Number	Frequency	Percent
1 - 5	32	35.6
6 - 10	36	40.0
11 - 15	9	10.0
16 - 20	6	6.7
21 - 46	7	7.7
TOTAL	90	100.0
MEAN	9.18	

More than one-half (50.5%) of the reference materials cited in the sample articles came from gray literatures. More than one-fourth (27.1%) were citations coming from books. Only 67 (22.4%) were taken from refereed journals. Among the gray literatures used by the researchers in citing references were conference proceedings, theses, bulletins/newsletters, monographs, terminal reports, manuals, abstracts, working papers, annual reports, and other non-refereed publications.

The citation analysis suggests that reference materials used by VICARP researchers are largely gray literatures. Table 4 presents the type of reference materials used by VICARP researchers in their publications.

References Cited in Articles Published in Refereed Journals

The literatures cited of the 30 samples taken from refereed journals ranged from 1 to 46, with a mean of 13. The total references cited reached 397. A small proportion (6.5%) of the literature cited were taken from national journals and a little more than two-fifths (40.8%) were sourced out from international journals. Other references were taken from

Table 6. References cited in 30 sample articles published in other R&D publications.

Reference Cited	Frequency	Percent
Books	67	29.3
Proceedings	35	15.3
Bulletins/Newsletters	29	12.7
International journals	28	12.2
National journals	22	9.6
Terminal Reports	13	5.7
Manuals	8	3.5
Working Papers	7	3.0
Theses	7	3.0
Abstracts	3	1.3
Annual Reports	3	1.3
Others	7	3.0
TOTAL	229	100.0
MEAN	6.83	

Reference Cited in Articles Published in "Non-Refereed Journals"

The literatures cited on the 30 samples taken from "non-refereed journals" ranged from 1 to 17, with a mean of 7.70. The total references cited reached 255. Again, only few (5.1%) reference sources were from national journals and 16.5% were taken from international journals. Books (50.2%) were the most reference sources of the sample articles. Gray literatures cited included proceedings (2.7%), theses (6.7%), bulletins/newsletters (6.2%), terminal reports (1.9%), manuals (1.6%), abstracts (3.5%), working papers (3.5%), annual reports (0.4%), and handouts and newspapers (1.6%) (Table 7).

Generally, the sample articles coming from refereed journals and books had high literature citation coming from refereed journals. The "non-refereed journals" and other R&D publications had relatively more citations in gray literatures. Figure 1 displays the citation frequencies of the three types of publications.

Table 7. References cited in 30 sample articles published in non-refereed journals.

Reference Cited	Frequency	Percent
National Journals	7	5.1
International Journals	10	16.5
Books	27	50.2
Proceedings	7	2.7
Theses	7	6.7
Bulletins/newsletters	9	6.2
Terminal Reports	4	1.9
Manuals	3	1.6
Abstracts	1	3.6
Working Papers	4	3.5
Annual Reports	1	0.4
Others	2	1.6
TOTAL	255	100.0
MEAN	7.7	

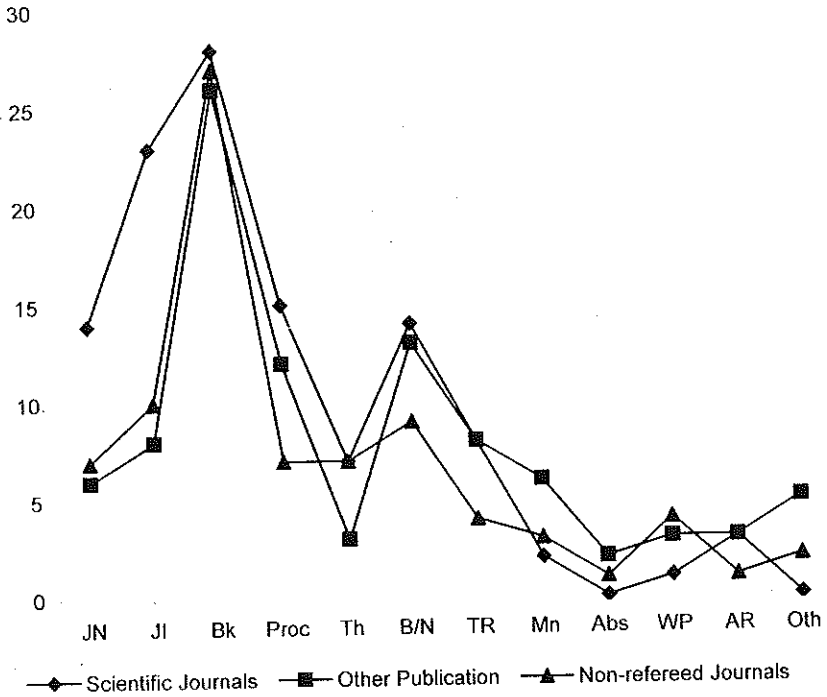


Figure 1. Frequency of reference citation in different publications.

 JN - National Journals
 Bk - Books
 Th - Theses
 TR - Terminal Reports
 Abs - Abstracts
 AR - Annual Reports

JI - International Journals
 Proc - Proceedings
 BN - Bulletins/newsletters
 Mn - Manuals
 WP - Working Papers
 Oth - Others

IMPLICATIONS AND RECOMMENDATIONS

Results of the citation analysis revealed that ViCARP researchers sourced out reference citations largely from gray literatures. Moreover, a number of academic member agencies of the consortium are publishing local journals that do not undergo adequate peer review. The researchers' reliance on non-refereed literature in the publication of research results needs to be addressed. As pointed out by Lacanilao (1997), this practice is contrary to the appropriate mechanism for communicating scientific results which is in peer-reviewed journals. There is a need for the research management to design activities to counter the proliferation of "non-refereed journals" and utilization of non-refereed materials in reference citations of research publications within the consortium. For example, a seminar may be designed for consortium researchers. The seminar may focus on the use of peer-reviewed publications when preparing research proposals and reports. To ensure that the literature used in their research projects are of quality, VICARP member-agencies should establish a policy requiring researchers to use peer-reviewed publications only. The academic institutions could also help minimize the proliferation of gray literature. In their research courses, for instance, students should be discouraged to use references which did not go through a peer-review. Thus, aside from developing students' skills in designing and writing research, the research course should also be designed to enable students to detect gray literature so that they could avoid its use.

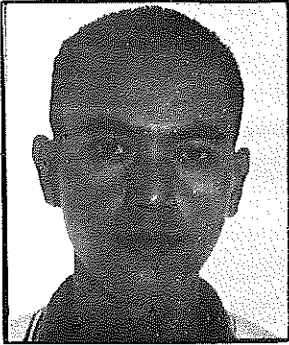
Although this study has information on the references cited, the findings have also given rise to a number of researchable areas considering the fact that the researchers tend to use gray literature, a

study aimed to investigate their reasons for doing so is in order. Moreover, it is interesting to conduct case studies to document the process of publishing gray and peer-reviewed publications.

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