

A TWO DECADE (1981-2000) ANALYSIS OF THE LITERATURE CITED IN THE *JOURNAL OF AGRICULTURAL EDUCATION*

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Abstract

The Journal of Agricultural Education serves as one of the primary sources for dissemination of new knowledge in the field of agricultural education. Analyzing the citation structure of articles published in the journal provides insight into the theoretical foundations utilized by agricultural education researchers. This analysis was a modified replication of a study performed by Radhakrishna, Eaton, Conroy, & Jackson (1994). Over the course of the 1990s the average number of reference citations per article increased from 13.1 to 19.7. Furthermore, journal articles made up nearly a third of all reference citations and the Journal of Agricultural Education was the most commonly referenced journal as it tallied over 30% of journals referenced. This study also compared current data with similar data collected by Radhakrishna et al. about the Journal of Agricultural Education during the 1980s. The researchers found that reference citations have increased nearly five times from 1981 to 2000. Consistent with the 1980s, authors during the 1990s reference the Journal of Agricultural Education significantly more than any other journal.

Introduction/Theoretical Framework

The *Journal of Agricultural Education* has been one of the primary outlets for disseminating research in the agricultural education discipline (Radhakrishna, 1995). Forty-seven volumes of the *Journal of Agricultural Education* have been published since 1961. Over the course of its lifetime, the journal has undergone several changes in size, format, content, frequency of publication (from three issues to four in 1983), and finally, a name change, in 1989, from *Journal of the American Association of Teacher Educators in Agriculture* to the *Journal of Agricultural Education* (Radhakrishna et al., 1994).

Citation studies are conducted to collect a variety of data. They can be conducted to create core lists of journals or to determine which journals or other titles have the greatest impacts (Shorter, 1995). These studies are also conducted by academic

librarians to evaluate and improve local collections, remove journals that are not being used enough to justify their cost, and relegate rarely-used materials to off-site storage (Shorter). Furthermore, researchers also investigate the aging or obsolescence of various literature. Recently published articles are cited more often than older published items (Wallace, 1987). White and McCain (1989) reported that article usage usually peaks two to three years after publication. However, other researchers noted that literature from different fields becomes antiquated at different rates (Glanzel & Shoepflin, 1995). These authors reported that articles in medical and chemistry journals become obsolete long before articles in social science journals.

Citation analysis provides an opportunity for authors and researchers to understand the influence and influencers of their work (Gall, Ku, Gurney, Tseng, & Yeh, 2004). Other researchers have considered citation

structure as an indicator of the nature of scientific activity (Radhakrishna et al., 1994). The study of citation structure also defines a discipline's boundaries, and provides insight into its interrelationship with other sciences (Narin, Carpenter, & Berlt, 1972). Still others conduct citation analysis to rank journals in a particular field to determine impact or importance (Shorter, 1995). For example, researchers have analyzed journals to determine which were most prestigious for publication in a given field to determine which would be the most valuable for authors when seeking tenure and promotion (Fang, 1989).

Multiple studies have been conducted in which citations were analyzed. Numerous studies have examined the output of knowledge represented by publications found in professional and academic journals for a variety of reasons. Researchers have investigated the literary production of individuals and academic departments for purposes as varied as determining differences in publication by prominence of author (Marlin & Durden, 1993; Stigler & Friedland, 1979), determining the prominence of individuals and departments (Gibbons & Fish 1991; Laband, 1986; Tschirhart, 1989), examining career conditions and adjustments of researchers (Diamond & Haunn, 1993; McDowell 1982), investigating the impact of author-to-editor relationships on journal quality (Laband & Piette, 1994), measuring the production and depreciation of knowledge represented by published research (Lovell, 1973), and determining the relative prominence of journals (Mabry & Sharplin, 1985).

Studies conducted by agricultural educators have been the subject of prior literary investigations. These studies included empirical analysis of the *Journal of Agricultural Education* during the eighties (Radhakrishna & Jackson, 1992); what topics were cited and who was cited (Moore, 1991); reader opinions of the *Journal of Agricultural Education* (Newman, 1990); statistical procedures used by agricultural educators in reporting research findings (Bowen, Rollins, Baggett, & Miller, 1990; Mannebach, McKenna & Pfau, 1984; Warmbrod, 1986) prolific authors

(Radhakrishna & Jackson, 1995); core journals used by agricultural and extension educators (Radhakrishna, 1995); subject matter topics researched in agricultural and extension education (Radhakrishna & Xu, 1997); and agricultural and extension education research published in terms of program area, area of focus, and scope (Crunkilton, 1988).

Objectives

The central purpose of this study was to examine the nature of sources cited (citation analysis) by the authors of articles published in five volumes of *the Journal of Agricultural Education* during the decade 1991-2000. The objectives of the study were to determine: (1) citation structure of the *Journal of Agricultural Education* over a 10 year period; (2) the relative importance of types of citations referenced by authors publishing articles in the *Journal of Agricultural Education*; (3) the core journals used by authors publishing articles in the *Journal of Agricultural Education*; and (4) in differences in means in objectives 1 and 2 with similar data collected about the *Journal of Agricultural Education* during the 1980s.

Procedures

Following the procedures as outlined by Radhakrishna et al. (1994) a census of all articles published in the *Journal of Agricultural Education* during the decade 1991-2000 was considered for this study. The sampling procedures as specifically outlined by Radhakrishna et al. were followed to reflect complete replication. Those researchers utilized a systematic sample in which every second year in the decade was selected for analysis. This resulted in the selection of the years, 1992, 1994, 1996, 1998, and 2000.

A total of 20 issues and 188 articles were analyzed to accomplish Objectives 1 through 3. For categorizing citations, the classification of citations by Goldsmith (1983) was consulted. Goldsmith's classification includes books; journal articles; doctoral dissertations/masters' theses; conference proceedings and paper presentations; magazines; and bulletins and

reports. Goldsmith's classification of citations was slightly modified, following the model of Radhakrishna et al. (1994), to better reflect the study needs. For example, dissertation abstracts were included in the dissertation and masters' thesis category. Furthermore, an "other" category was added in order to account for websites cited within various articles. Staff studies, summary research reports, and Educational Resources Information Center (ERIC) documentation abstracts were included in the bulletin/reports category. The total number of citations per article, per issue, and per year was also determined. In addition, it was also determined how many citations were from the following types of publications: books; journal articles; doctoral dissertation and masters' theses; paper presentations and conference proceedings; and bulletins and reports. Frequencies, percentages and means were used to describe the data.

Findings

The first objective was to determine citation structure of the *Journal of Agricultural Education* over a 10 year period. According to Radhakrishna et al. (1994) scientists use a variety of methods to communicate their research findings. With this in mind the researchers attempted to determine if differences existed between the sources used by agricultural education researchers during the 1980s versus researchers during the 1990s. Similar to the findings of Radhakrishna et al. over the course of a decade the mean number of references cited increased. Radhakrishna et al. noted that the number of articles published in the *Journal of Agricultural Education* increased over the course of the 1980s. However, throughout the decade of the 1990s the number of articles per volume stayed relatively constant. During the sample years, the number of citations ranged from 13.1 per article in 1992 to 19.7 in 2000, with an overall mean of 16.3 (Table 1).

Table 1
Average Number and Distribution of Articles and Citations by Year (1992-2000)

	Year					Total
	1992	1994	1996	1998	2000	
Number of Articles	31.0	48.0	32.0	31.0	44.0	188.0
Number of Citations	405.0	714.0	490.0	597.0	867.0	3073.0
Average Number of Citations Per Article	13.1	14.9	15.3	19.3	19.7	16.3

The second objective was to determine the relative importance of types of citations referenced by authors publishing articles in the *Journal of Agricultural Education*. Generally, agricultural educators are most likely to cite information from journals (32.2%), followed by books (30.1%), bulletins/reports (15.8%), conference

papers/proceedings/presentations (10.0%), dissertations/theses (6.8%), and popular publications and other sources (5.1%). Furthermore, the use of journals, books, bulletins/reports, and papers/proceedings/presentations increased steadily throughout the decade. These data are presented in Table 2.

Table 2
Number and Percentage Distribution of Citations by Type, Year, and Total (1992-2000)

Citation Type	Year					Total	%
	1992	1994	1996	1998	2000		
Journals	116	218	146	225	285	990	32.2
Books	108	256	158	159	244	925	30.1
Bulletins/Reports	88	102	73	78	146	487	15.8
Papers/Proceedings	32	66	53	49	107	307	10.0
Dissertations/Theses	37	53	44	36	40	210	6.8
Magazines	23	19	16	46	35	139	4.5
Other	1	0	0	4	10	15	0.6
Total	405	714	490	597	867	3073	100.0

Because journal citations make up nearly a third of all citations, the third objective was to determine the core journals used by authors publishing articles in the *Journal of Agricultural Education*. The *Journal of Agricultural Education* (31.1%) is, overwhelmingly, the most often cited, followed by the *Journal of Extension* (7.1%), and the *NACTA Journal* (4.0%) (Table 3). It is also worthy of noting that agricultural educators cited over 125

journals throughout the analyzed articles. This broad range of journal usage over a variety of disciplines indicates the interdisciplinary approach held by agricultural education researchers (Radhakrishna et al., 1994). For example, these journals included topic areas such as agricultural economics, animal and plant sciences, and developmental psychology. These data can be found in Table 3.

Table 3
 Number, Percentage, and Rank Order of Ten Most Cited Journals by Year and Total (1992-2000)

Journal	Year					Total	%	Rank
	1992	1994	1996	1998	2000			
<i>Journal of Agricultural Education</i>	30	46	60	68	104	308	31.1	1
<i>Journal of Extension</i>	13	19	8	11	19	70	7.1	2
<i>NACTA Journal</i>	4	4	7	9	16	40	4.0	3
<i>Educational & Psychological Measurement</i>	7	9	4	1	5	26	2.6	4
<i>Vocational Education Journal</i>	1	6	1	11	3	22	2.2	5
<i>Journal of Teacher Education</i>	0	5	7	2	5	19	2.0	6
<i>Educational Leadership</i>	3	6	0	4	6	19	2.0	7
<i>Phi Delta Kappan</i>	5	0	4	6	3	18	1.8	8
<i>Journal of Applied Psychology</i>	0	10	0	5	0	15	1.5	9
<i>Journal of Applied Communications</i>	1	2	1	3	2	9	0.9	10
Other Journals	52	111	54	105	122	444	44.8	

The fourth objective was to determine if any differences exist in means found in Objectives 1 and 2 during the 1990s with similar data collected about the *Journal of Agricultural Education* during the 1980s. Figure 1 is a visual representation of how the average number of citations per article has more than quadrupled from a low of 4.5 citations per article in 1982 (Radhakrishna et

al., 1994) to 19.7 in 2000. Table 4 presents data regarding the changes in citation frequency from 1981-2000. It is interesting to note that the citing of peer reviewed journal articles, books, and papers/proceedings have all increased by at least 120%, while the citations of non-peer reviewed magazines have decreased by 12.5%.

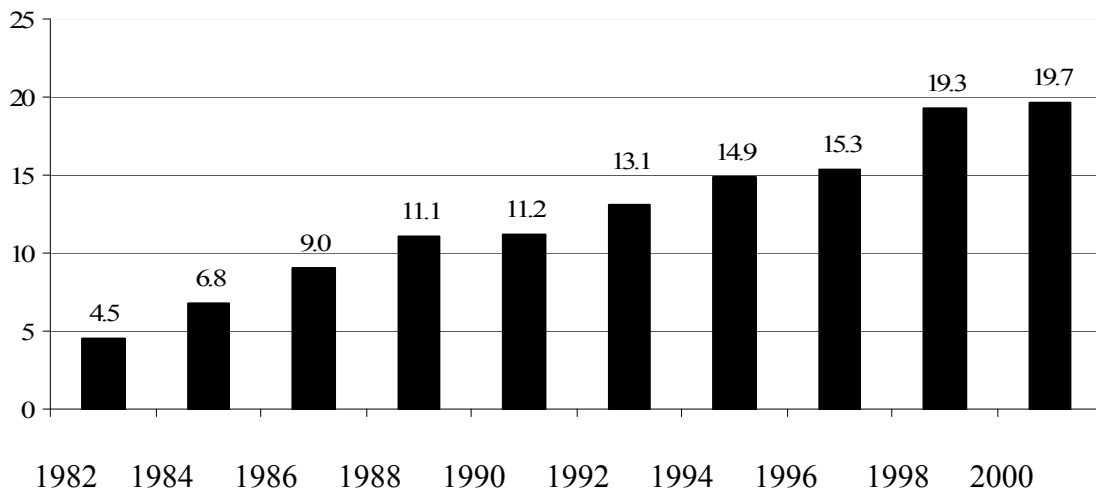


Figure 1. Average citations per article from 1981-2000.

Table 4
Citation Trends from 1981-2000

Citation Type	1981-1990 Avg. citations	1991-2000 Avg. citations	1981-2000 Total Change	Percent Change
Journals	2.3	5.3	3.0	130.0
Books	2.2	4.9	2.7	122.7
Bulletins/Reports	2.0	2.6	0.6	3.0
Dissertations/Theses	1.2	1.1	-0.1	-0.8
Magazines	0.8	0.7	-0.1	-12.5
Papers/Proceedings	0.5	1.6	1.1	220.0
Other	-	0.1	0.1	N/A

Conclusions and Recommendations

Analyses of journals can provide insight into the research and publishing characteristics of a profession (Radhakrishna et al., 1994). This study was conducted to answer the call put forth by Radhakrishna et al. to analyze the citation structure of the *Journal of Agricultural Education*. This study attempted to identify the

characteristics of literature cited in *Journal of Agricultural Education* and compare those results with data from the study conducted by Radhakrishna et al. in order to determine if what changes have taken place as a result of the research efforts in the profession.

Over the course of the 1990s the total number of reference citations in each article published in the *Journal of Agricultural*

Education has increased steadily. This may be attributed to multiple factors. First, researchers during the 1990s more thoroughly reviewed the literature before conducting a study and later built upon that literature more effectively. Second, there was simply more research to build upon during the 1990s as opposed to the 1980s and therefore more reference citations were a result.

The authors during the 1990s built upon data already published in the journal to the point where nearly a third of all journal reference citations were the *Journal of Agricultural Education*. This can be viewed as the discipline has strong self-identification, which suggests that agricultural educators tend to build upon each others work (Radhakrishna et al., 1994). However, Frisby (1998) would argue that this is “within-journal inbreeding” and should be carefully analyzed in order to ensure that the profession does not lose diversity of subject matter.

The use of peer reviewed journal articles or professional papers and presentations rose significantly over the course of two decades. Furthermore, the use of non-peer reviewed sources has slightly declined over the same time period. This can certainly be attributed to the increased number of journal articles and papers published and research conferences conducted.

The researchers hypothesized the increased number of citations may be a result of easier access to prior research through electronic sources. The utilization of the Internet and development of search engines has also provided researchers with a tool to locate related literature at a high rate of speed and easy access to libraries worldwide. Electronic card catalog and ERIC have provided researchers with opportunities to search previously published research more efficiently from the convenience of their own office. The development of online journals has provided easier access to researchers to journals both inside and out of the agricultural education profession.

Researchers in the agricultural education discipline should continue to conduct scholarly research and publish quality literature. Continuing to utilize the superior

research that has been previously published and is readily available through multiple sources can ensure this.

The researchers recommend that professional research organizations continuously maintain and update online access to previous research conference proceedings and journals. Professional organizations allow for free access to online journal articles. This will enable researchers to access other disciplines and the related research that is being conducted in order to expand the knowledge within their discipline. Free access will also provide teachers in the field an opportunity to utilize relevant practices and apply new knowledge into their classrooms.

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