

Citation Structure: An Analysis of the Literature Cited in the *Journal of Applied Communications* from 1997 to 2006

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Abstract

The Journal of Applied Communications (JAC) is a primary outlet of agricultural communications publishing and research dissemination. The purpose of this study was to assess ten years of JAC to determine literature cited. The study used a quantitative content analysis design. Analyzed in the study were 91 research and/or professional articles with research methodologies published from 1997 through 2006. There were 1,732 cited literature works identified in the journal. The average number of citations per article was approximately 19. Cited works from identified premier agricultural education journals were tracked for citation frequencies, in terms of author(s) and year of publication. A total of 143 references were made to journals identified as premier. The most frequently cited journals were from journalism, communications, and mass communications sources, including JAC. Additional cited works are defined. Citation analysis indicates that JAC relies heavily on books, journals, conference proceedings, and other literacy works outside agricultural communications. JAC does not exhibit compactness, indicating that it reaches past its citation boundaries and into interrelated areas of other disciplines. However, it does exhibit weak self-identity meaning it does little to build upon research previously cited in JAC.

Introduction

The Journal of Applied Communications (JAC) has undergone numerous changes since its conversion from a newsletter to a journal in 1990. Some of those modifications have included a change in format and frequency of publishing and content. During *JAC*'s lifespan, a number of researchers have examined various publishing and research aspects of the agricultural communications and agricultural education professions. One focus of the previous research has been on previously cited literature (Miller, Stewart, & West, 2006; Moore, 1991; Radhakrishna, 1995; Radhakrishna, Eaton, Conroy, & Jackson, 1994).

Previous research indicated the explicit need to analyze citation characteristics in agricultural education (Radhakrishna et al., 1994). The research further noted "a number of researchers in various scientific disciplines have considered citation structure as a good indicator of the nature of scientific activity" (Radhakrishna et al., p. 61). Furthermore, quoting additional experts whom indicated an analysis of citation structures "characterize a field of study, define its boundaries, and explain how a discipline is interrelated with other fields of study" (Radhakrishna et al., p. 61). Citations can be used as an indicator of scholars' behavior because it reflects an author's debt to earlier works. The frequency of cited literature can provide a framework of important references and can be a means by which authors anchor their work and relate it to earlier research (Garfield, 1998).

In 2006, Miller, Stewart, and West's research identified the need to review literature and track citations to maintain a clear sense of the disciplines research agenda. In a reply to Doerfert's (2003) essay, Tucker (2004) made further comments to support the need for those in agricultural communications to take notice of research citations. As the discipline progresses forward with research, after the development of a National Research Agenda [NRA]: Agricultural Education and Communication 2007-2010 (Osborne, n.d.); it is important to understand how agricultural communications has moved forward with citations within the discipline. Are we primarily citing works created in our field, or do we rely on other disciplinary areas as literary staples? In 1994, a content analysis of the *Journal of Agricultural Education* indicated that the agricultural education discipline appeared to have a strong self-identity (building on other researchers' work within the discipline of agricultural education) and compactness (citing from few "core" journals) (Radhakrishna et al., 1994). However, a 1995 study indicated agricultural education should expand their focus to include other areas of research interests for professionals in the field (Radhakrishna, 1995). Little to no research has focused on literature citations in agricultural communications, specifically how agricultural communications literature feeds into the broader umbrella of agricultural education and/or mass communications and journalism. In addition, there is a need to determine the level of self-identity and compactness represented in literature cited in *JAC*.

As agricultural communications continues to expand in knowledge pursuit, development, and examination, it is important to analyze the dimensions and frequencies of citations in its premier journal, the *Journal of Applied Communications* (Edgar, Edgar, Briers, & Rutherford, 2008). *JAC* should also be examined to determine the level and depth of literature citations being made to *JAC* articles, to other premier journals identified in the agricultural education discipline, and to other journals that support the field such as mass communications and journalism. Besides *JAC*, premier journals in agricultural education include the *Journal of Agricultural Education*, the *Journal of International Agricultural and Extension Education*, the *North American Colleges and Teachers of Agriculture Journal*, the *Journal of Extension*, and the *Journal of Leadership Education* (Edgar et al., 2008). With the development and embracing of the NRA it is important for the agricultural communications field of study to understand how other established premier journals are being utilized within the field. Citation structure research has been used to characterize a field of study and explain how a discipline is inter-related to other fields (Narin, Carpenter, & Berlt, 1972).

Analyzing literature citations adds to the understanding and the identification of the literature base of agricultural communications. In an effort to better understand where the agricultural education discipline is securing information to support the contexts of the broad disciplinary areas identified in the NRA, content analysis can be used to analyze literature cited. To better understand the scope and impact of agricultural communications on the agricultural education discipline, the journal identified as premier for the agricultural communications disciplinary area (*JAC*) should be analyzed (Edgar et al., 2008).

In 1994, one of the first attempts to quantify cited literature in agricultural education was conducted (Radhakrishna et al., 1994). Since that time little to no research has focused on cited works within the field. It appears that Miller, Stewart and West's (2006) research was one of the first attempts to track literature citations in agricultural communications. Prior to and after that time, little to no research was conducted to determine cited works within agricultural communications. However, analyzing cited science literature has been important since the 1950s (Garfield, 1998). In 2006, Funkhouser completed a citation analysis of twenty-seven communication journals published

during 1990. This research introduced the Journal Impact Rating System (a measure for comparing journal impact on the basis of citations). This rating system can be used to determine the scope and impact of literature on a field of study and to create leverage when attempting to place a scholarly communication journal into the Social Sciences Citation Index (SSCI). It is crucial for agricultural communications to examine cited works used in its premier journal in an effort to determine how its previous works are supporting current works, how research is supported by other premier journals in agricultural education and the mass communications and journalism field, and identify *JAC*'s self-identity and compactness levels.

Conceptual Framework

The future of agricultural education and communications depends on many variables and application and acquisition of new knowledge via research is extremely important (Dyer, Haase-Wittler, & Washburn, 2003). The conceptual framework of the study was grounded in work by numerous scholars in agricultural education and agricultural communications. Several researchers have completed various components of journal analyses in agricultural education: Familiarity and quality of journals and importance of faculty publishing (Radhakrishna, 1995; Radhakrishna & Jackson, 1993); research theme areas (Buriak & Shinn, 1993; Dyer et al., 2003; Edgar et al., 2008; Miller et al., 2006; Moore, 1991; Radhakrishna & Xu, 1997; Silva-Guerrero & Sutphin, 1990); prolific authors (Harder & Roberts, 2006; Radhakrishna & Jackson, 1995; Radhakrishna, Jackson, & Eaton, 1992); statistical methods used (Bowen, Rollins, Baggett, & Miller, 1990; Dyer et al., 2003; Mannenbach, McKenna, & Pfau., 1984), and cited literature (Moore, 1991; Radhakrishna et al., 1994; Radhakrishna, 1995; Miller et al., 2006). Conceptually this study focused on cited literature. Citationology, the theory and practice of analyzing citations, "allows a discipline to determine reference topology" (Garfield, 1998, p. 69).

Purpose and Objectives

The purpose of this study, which was a part of a larger study, was to review research published in the *Journal of Applied Communications* from 1997 to 2006 and examine the historical record of the journal to provide insight into its cited works. The specific objective was to describe and synthesize frequent literature cited in *JAC* during the ten year period by (a) premier journal articles (represented by author(s) and year) (premier journals were identified in previous research by Edgar et al., 2008); (b) journals; (c) books/texts; (d) proceedings, conferences and meetings; (e) other works (dissertations, extension and university manuscripts, magazines, newspapers, etc); and (f) websites.

Research Methods and Procedures

This study employed a quantitative content analysis design. Content analysis as a research method has existed for decades (Weber, 1990). Content analysis can be used to give researchers insight into problems or hypotheses that can then be tested by more direct methods. Content analysis is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson, 1952; Krippendorff, 1980; Weber, 1990).

Content validity was maintained using previous research as a guide. Research journal articles from 1997 to 2006 in the *Journal of Applied Communications* were used as the frame for the study. The principal investigator and a peer independently reviewed the material and formed a checklist of information required during the review of each journal article. The researchers compared notes

and reconciled differences on their initial checklists via negotiations. Researchers used a consolidated checklist to independently apply coding. The citation check list included items such as: author names, date of publication, title of article, source of publication, etc. The researchers then checked for agreement in coding; if reliability was not acceptable, then the previous steps were repeated. Once reliability had been established, coding was applied on a large-scale basis. The final stage was a periodic quality control check (Weber, 1990). Inter-coder reliability was completed with at least 10% overlap for the reliability test. Final reliability was calculated using a random sample of 5% of the analyzed articles. Reliability was assessed using Spearman's rho statistical analysis. Spearman's rho is a statistical calculation that takes two rankings and produces a numerical relation from 1 to -1 (A score of 1 means that the lists are identical, a -1 means that the lists are reversed, and 0 (zero) score means that there is no relation whatsoever between the two lists). Reliabilities met or exceeded the minimum standard of .70 (Bowen et al., 1990; Tuckman, 1999).

Findings

All research and/or professional articles with research methodologies (N = 91) published in *JAC* from 1997 to 2006 were analyzed for cited literature. A total of 1,732 cited works were identified. The average number of citations per article was approximately 19. Premier agricultural education journals were tracked for literature cited in *JAC*, in terms of author(s) and year of publication. A total of 143 references were made to premier journals in agricultural education. Representing approximately 8.25% of the total cited literature in *JAC*. There were 36 cited works from previous publications from the *Journal of Agricultural Education (JAE)*. Lindner, Murphy and Briers (2001) were the most frequently referenced *JAE* authors identified in the 10-year analysis of *JAC*. Their article focused on non-response error was cited in more than 8% of the referenced *JAE* articles. Additional frequently referenced *JAE* articles, identified by the author(s) and year of publication, cited 5.6% or more are identified in Table 1.

Table 1

Frequently Cited Journal of Agricultural Education Authors Referenced in JAC 1997–2006 (n = 36)

Journal Author(s) and Year of Publication	<i>f</i>	%
Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001)	3	8.3
Birkenholz, R. J., Harbstreit, S. R., & Law, D. A. (1990)	2	5.6
Cano, J. & Martinez, C. (1991)	2	5.6
Clason, D. L. & Dormody, T. J. (1994)	2	5.6
Rollins, T. J. (1990)	2	5.6
Rudd, R., Baker, M., & Hoover, T. (2000)	2	5.6
Torres, R. M. & Cano, J. (1995)	2	5.6
Vestal, T. A. & Briers, G. E. (2000)	2	5.6
Whittington, S. (1995)	2	5.6
Whittington, S. (2000)	2	5.6

The 10-year content analysis of *JAC* yielded one citation to the *Journal of International Agricultural and Extension Education (JIAEE)*. The cited article was authored by Rivera (1996).

There were 37 total citations from works previously published in the *Journal of Extension (JOE)* represented in the *JAC* analysis. An article on non-response error authored by Miller and Smith (1983) was the most frequently cited. Their article was referenced in 16.2% of the identified *JOE* articles. Table 2 contains a list of frequently cited *JOE* articles, identified by the author(s) and year of publication, referenced 5.4% or more.

Table 2

Frequently Cited Journal of Extension Authors Referenced in JAC from 1997–2006 (n = 37)

Journal Author(s) and Year of Publication	<i>f</i>	%
Miller, L. E. & Smith, K. L. (1983)	6	16.2
Caffarella, R. S. (1982)	2	5.4
Jackson, D. & Smith, K. (1999)	2	5.4
Obahayujie, J. & Hillison, J. (1988)	2	5.4
Tennessen, D. J., PonTell, S., Romine, V., & Motheral, S. W. (1997)	2	5.4

There were five citations referencing works from the *North American Colleges and Teachers of Agricultural (NACTA)* Journal identified in *JAC*, for the 10-year content analysis. Each of the five *NACTA* articles was referenced once. The referenced authors were Diebel, P. L., McInnis, M. L., and Edge, W. D. (1998); Miller, G. (1997); Nehiley, J. and Sutherland, J. (1995); O'Kane, M. and Armstrong, J. D. (1997); and Woirhaye, J. L. and Menkhaus, D. J. (1996) (each article represents 20% of the overall citations represented from *NACTA*).

There were 64 citations referencing works from previous *JAC* articles. Reiser's (1990) article focused on agricultural communication programs and curricula was the most frequently cited *JAC* publication in *JAC*. The article was cited in slightly more than 6% of the referenced articles. The Banning, S. A. and Evans, J. F. (2001) article focused on the advertiser-media-reader triad, the Miller, G. & Carr, A. (1997) article focused on distance education needs, and the Ten Eyck, T. A. (2000) article focused on food safety were each references three times (4.7%). Table 3 contains a list of frequently cited *JAC* articles, identified by the author(s) and year of publication and cited at least 3.1%.

The 10-year content analysis of *JAC* yielded no citations to the *Journal of Leadership Education*.

In *JAC*, there were 143 citations referencing the six premier agricultural education (AGED) journals as identified by Edgar et al. (2008). An important component of this research was identifying how *JAC* was citing other journals within the large umbrella of the agricultural education discipline. The most frequently cited referenced premier AGED journal article was produced by Miller and Smith (1983) for their work published in the *JOE* (4.2%). Their article focused on handling nonresponse error. Followed by Reiser's (1990) *JAC* article focusing on agricultural communications programs and curricula.

Table 3

Frequently Cited Journal of Applied Communications Authors Referenced in JAC from 1997–2006 (n = 64)

Journal Author(s) and Year of Publication	<i>f</i>	%
Reisner, A. (1990)	4	6.3
Banning, S. A. & Evans, J. F. (2001)	3	4.7
Miller, G. & Carr, A. (1997)	3	4.7
Ten Eyck, T. A. (2000)	3	4.7
Bielema, C. L. (1997)	2	3.1
Boone, K. M., Tucker, M., & McClaskey, J. M. (2002)	2	3.1
Bruening, T. H. (1991)	2	3.1
Caldwell, A. E. & Richardson, J. G. (1995)	2	3.1
Connors, J. J., Elliot, J., and Heinze, K. (1991)	2	3.1
Donaldson, J. L. & Thompson, J. S. (1999)	2	3.1
Reisner, A. (1991)	2	3.1
Richardson, J. (1999)	2	3.1
Richardson, J. G. & Mustian, R. D. (1994)	2	3.1
Richardson, J. G., Clement, D. M., & Mustian, R. D. (1997)	2	3.1
Sprecker, K. J. & Rudd, R. D. (1998)	2	3.1
Suvedia, M., Campo, S., & Lapinski, M. K. (1999)	2	3.1
Sweeney, S. & Hollifield, C. A. (2000)	2	3.1
Thomas, R. E. (1996)	2	3.1
Trede, L. D. & Whitaker, S. (1998)	2	3.1

JAC cited additional journals, other than those identified as premier AGED journals, 608 times. The most frequently cited journals were from journalism, communications, and mass communications sources. *Journalism Quarterly* (4.11%) was the most frequently cited journal of all journal citations in *JAC*. A list of frequently cited journals identified 0.66% or more times (excluding the premier AGED journals) is identified in Table 4.

Table 4
Frequently Cited Journals Referenced in JAC from 1997–2006 (n = 608)

Other Journal	<i>f</i>	%
<i>Journalism Quarterly</i>	25	4.11
<i>Journal of Communication</i>	14	2.30
<i>Journalism and Mass Communication Quarterly</i>	13	2.14
<i>Public Opinion Quarterly</i>	13	2.14
<i>Public Relations Review</i>	13	2.14
<i>Science Communication</i>	12	1.97
<i>The American Journal of Distance Education</i>	12	1.97
<i>Agriculture and Human Values</i>	11	1.81
<i>ACE Quarterly</i>	9	1.48
<i>American Journal of Agricultural Economics</i>	9	1.48
<i>Educational Communications Technology Journal</i>	6	0.99
<i>American Journal of Clinical Nutrition</i>	5	0.82
<i>BioScience</i>	5	0.82
<i>Public Relations Quarterly</i>	5	0.82
<i>The Chronicle of Higher Education</i>	5	0.82
<i>AgBioForum</i>	4	0.66
<i>American Behavioral Scientist</i>	4	0.66

A comparison of the most frequently cited journals in *JAC* are identified in Table 5. The *Journal of Applied Communications* (8.52%) was the most frequently cited journal. It was followed by the *Journal of Extension* (4.93%), the *Journal of Agricultural Education* (4.79%), and the *Journalism Quarterly* (3.33%).

The 10-year analysis of *JAC* identified 584 cited books and texts. Books with multiple edition and publication dates are noted in the following table. The most frequently cited book was Dillman's (2000) *Mail and Internet Surveys: The Tailored Design Method*, which was cited in 2.74% of the total books referenced. Additional frequently cited books and texts, identified 0.51% or more times, in *JAC* from 1997–2006, are identified in Table 6.

Table 5

A Comparison of the Most Frequently Cited Journals Referenced in JAC from 1997–2006 (n = 751)

Other Journal	<i>f</i>	%
<i>Journal of Applied Communications</i>	64	8.52
<i>Journal of Extension</i>	37	4.93
<i>Journal of Agricultural Education</i>	36	4.79
<i>Journalism Quarterly</i>	25	3.33
<i>Journal of Communication</i>	14	1.86
<i>Journalism and Mass Communication Quarterly</i>	13	1.73
<i>Public Opinion Quarterly</i>	13	1.73
<i>Public Relations Review</i>	13	1.73
<i>Science Communication</i>	12	1.60
<i>The American Journal of Distance Education</i>	12	1.60
<i>Agriculture and Human Values</i>	11	1.46
<i>ACE Quarterly</i>	9	1.20
<i>American Journal of Agricultural Economics</i>	9	1.20
<i>Educational Communications Technology Journal</i>	6	0.80
<i>American Journal of Clinical Nutrition</i>	5	0.66
<i>BioScience</i>	5	0.66
<i>North American Colleges and Teachers of Agricultural</i>	5	0.66
<i>Public Relations Quarterly</i>	5	0.66
<i>The Chronicle of Higher Education</i>	5	0.66

Table 6

Frequently Cited Books and Texts Referenced in JAC from 1997–2006 (n = 584)

Book and Text	<i>f</i>	%
Dillman, D. A. (2000; 1978). <i>Mail and Internet surveys: The tailored design method</i> (2nd ed.). New York: John Wiley & Sons, Inc.	16	2.74
Rogers, E. M. (1995; 1983). <i>Diffusion of innovations</i> (4th ed.; 3rd ed.) New York, NY: The Free Press.	8	1.37
Miles, M. B. & Huberman, A. M. (1994). <i>Qualitative data analysis</i> (2nd ed.). Thousand Oaks, CA: Sage Publications.	7	1.20
Ary, D., Jacobs, L., & Razavieh, A. (2001; 1990; 1985; 1979). <i>Introduction to research in education</i> (6th ed.; 5th ed.; 4th ed.; 3rd ed.). Wadsworth Publishing.	4	0.68
Boone, K., Meisenbach, T., & Tucker, M. (2000). <i>Agricultural communications: Changes and challenges</i> . Ames, IA: Iowa State University Press.	4	0.68
Merriam, S. B. (1998). <i>Qualitative research and case study applications in education</i> . San Francisco: Jossey-Bass Publishers.	4	0.68
Mueller, D. J. (1986). <i>Measuring social attitudes</i> . New York: Teachers College Press.	4	0.68
DeFleur, M. L. & Ball-Rokeach, S. J. (1989; 1982; 1975). <i>Theories of mass communication</i> (4th ed.; 3rd ed.; 2nd ed.). New York: Longman.	3	0.51
Evans, J. F. & Salcedo, R. (1974). <i>Communications in agriculture: The American farm press</i> . Ames, Iowa: Iowa State University Press.	3	0.51
Fishbein, M. & Ajzen, I. (1975). <i>Belief, attitude, intention and behavior: An introduction to theory and-research</i> . Reading, MA: Addison-Wesley.	3	0.51
Gallup Organization. (2000). <i>Trends in agriculture study: Large producer scorecards</i> . Princeton, New Jersey: Gallup Organization.	3	0.51
Gitlin, T. (1980). <i>The whole world is watching: Mass media in the making and unmaking of the New Left</i> . Berkeley, CA: University of California Press.	3	0.51
Glaser, B. (1978). <i>Theoretical sensitivity</i> . Mill Valley, CA: The Sociology Press.	3	0.51
Morgan, D. L. (1997; 1988). <i>Focus groups as qualitative research</i> . Newbury Park, CA: Sage.	3	0.51
National Research Council. (1988). <i>Understanding agriculture: New directions for education</i> . Washington D.C.: National Academy Press.	3	0.51
Newcomb, L. H., McCracken, J. D., & Warmbrod, J. R. (1993). <i>Methods of teaching agriculture</i> (2nd ed.). Danville, IL: Interstate.	3	0.51
Pedhazur, E. J. (1982). <i>Multiple regression in behavioral research</i> . Fort Worth: Holt, Rinehart and Winston, Inc.	3	0.51

JAC cited proceedings, conferences, and/or meetings 104 times. The most frequently referenced proceeding, conference, and/or meeting was the Agricultural Communicators in Excellence Conference. The conference was referenced more than 17%. The National Agricultural Education Research Conference was identified in 13.5% of the conference citations. Followed by the Southern Association of Agricultural Scientists Conference (9.6%), the International Conference of the International Federation of Science Editors (7.7%), the Southern Agricultural Education Research Conference (5.8%), The Association for Education in Journalism and Mass Communication (3.8%), the International Consortium on Agricultural Biotechnology Research (ICABR) Conference (2.9%), and the International Meeting of Association for Communications Excellence (2.9%).

The 10-year analysis of *JAC* identified other works cited 171 times. The most frequently cited works were newspapers referenced 15.8%. Additional other works cited 1.8% of the time or more, in *JAC* from 1997–2006, are identified in Table 7.

Table 7

Frequently Cited Other Works Referenced in JAC from 1997–2006 (n = 171)

Other Work	<i>f</i>	%
Newspapers	27	15.8
University Manuscript	21	12.3
Unpublished Doctoral Dissertation	21	12.3
Unpublished M.S. Thesis	20	11.7
Unpublished Manuscripts or Reports	18	10.5
Annual or Final Reports	10	5.8
ERIC Documents	9	5.3
Magazines	9	5.3
Census/Government Documents	8	4.7
Newsletter/bulletin	6	3.5
Extension Manuscript	3	1.8
Policy and Laws	3	1.8
Raw Data	3	1.8

JAC from 1997 to 2006 cited websites 122 times. *JAC* relies heavily on citations from non-profit (.org) (32%) and education (.edu) (22.1%); followed by .gov (21.3%), .com (20.5%), and other (.ie .int, .html, .ne) websites.

Conclusions, Discussion and Implications

“Journal analysis can provide a means of assessing key factors that usually indicate the research and publishing characteristics of a profession” (Radhakrishna et al., 1994, p. 64). This study was an

attempt to identify the characteristics of literature cited in the *Journal of Applied Communications*. As stated by Miller et al. (2006), there is a need to track citations and review literature to gain a clear sense of the discipline's research agenda. This study showed an in-depth look into a premier research outlet for agricultural communications in terms of literature cited during a ten year period. Radhakrishna et al. and Garfield (1998) indicated that by identifying a discipline's cited literature base, a framework could be developed to characterize the field of study, define its boundaries and explain how a discipline is interrelated with other fields of study. This study was an attempt to identify the cited literature base in *JAC* and determine its self-identity and compactness.

All research journal articles (N = 91) published in the *JAC* from 1997 to 2006 were analyzed for cited literature. There were a total of 1,732 cited works identified. The average number of citations per article was approximately 19. In articles published in the *JAC*, from 1997 through 2006, it is evident that the discipline pulls from an expansive pool of research works. This study identified 8.26% of the total literature cited was from works published in identified premier agricultural education journals (Edgar et al., 2008). However, journals such as *JIAEE*, *NACTA* and *JOLE* were extremely under-represented or not cited in the literature. Of the 143 literature citations to premier agricultural education journals, *JAC* represented 3.7% of the total citations. This study concludes that *JAC* exhibits weak self-identity, meaning it does little to build upon research previously cited in *JAC*. However, it does not exhibit compactness, indicating that it reaches past its citation boundaries and into inter-related areas of other disciplines.

JAE was identified, in previous research, as the premier journal in agricultural education. Within cited literature represented in *JAC*, *JAE* was referenced about half as much as *JAC*. Does this have implications for the agricultural communications profession? It does imply that *JAC* authors rely most heavily on it and *JAE* for literary works (when looking specifically at identified premier journals). Although previously identified as the second most premier journal in the agricultural education discipline (Edgar et al., 2008), *JIAEE* research was only cited once in referenced literature in the *JAC*. Because of *JIAEE*'s standing, should we as agricultural communication authors strive to cite from this source and published articles in this venue? Similarly, *NACTA* and *JOLE* were also minimally cited in articles published in the *JAC*. It is further concluded that research published from these journals are not used with emphasis or, perhaps, thought. *JOE* was cited more (25.9%) than *JAE* (25.2%) in analyzed *JAC* articles. Approximately 16%, of the total number of citations from *JOE*, stem from a single article by Miller and Smith (1983) discussing non-response research methodology. This same article was identified as the most frequently cited premier agricultural education journal article represented in *JAC* citations. When looking at *JAC* citations of its own published works, there are not predominate works identified. This may be due to relatively few faculty members producing research in multiple contextual areas associated with agricultural communications.

Other journals (not identified as premier in agricultural education) referenced in research published in *JAC* were identified. The *Journalism Quarterly* represented more than 4% of the total journals being cited. References to the *Journal of Communications* (2.3%), *Journalism and Mass Communication Quarterly* (2.14%), *Public Opinion Quarterly* (2.14%), and *Public Relations Review* (2.14%) indicate research authors of *JAC* are using multiple communications and journalism journals to build on knowledge constructs. Not a surprise to most since agricultural communications can be seen as a peer discipline to journalism and communications.

A comparison of journals cited indicated that the *Journal of Applied Communications* was the most frequently cited journal (8.52%), followed by the *Journal of Extension* (4.93%), the *Journal of Agricultural Education* (4.79%), and the *Journalism Quarterly* (3.33%).

Books and text citations are dominated by research methodologies with eight of the seventeen most frequently cited books focusing on research methodologies. Coinciding with this finding, the most common citations from *JAE* and *JOE* were research methodology citations. A large percentage of cited books also focused on communication and mass communication theory and/or media (four of the seventeen most cited books). Conversely, there is a tremendous amount of variety in cited books within *JAC*. This variety is an indication that there are multiple books being cited on a single construct of knowledge. The majority of cited books were from the 1990s or earlier, and this may be affecting the literature relevance of agricultural communications.

Citations referring to conference proceedings and/or meetings are relatively diverse. With the most frequently cited conference being the Agricultural Communicators in Excellence Conference (17.3%); followed by the National Agriculture Education Research Conference (13.5%). Similarly, newspapers (15.8%) and university manuscripts and unpublished doctoral dissertations (12.3% respectively) were the most referenced other works identified in this study (26.9%). It is unclear whether the university manuscripts and doctoral dissertations are being published later as research articles. There were 122 citations to websites. The discipline relies heavily on citations from non-profit (.org) (32%) and education (.edu) (22.1%) websites. How these websites are being used has not been determined; however, it is encouraging that the majority of sites are utilizing extensions associated with trustworthy information.

Literature citations characterize a field of study. Furthermore, they define a discipline's limits and clarify the interrelatedness with other fields of study (Radhakrishna et al., 1994). *JAC* exhibits an expansive cited literature (citationology) reach focusing on multiple disciplinary areas and fields of study. It also exhibits connectedness to most of the identified premier journals in agricultural education. Because of the nature of agricultural communications, it is often necessary for researchers to expand into multiple research outlets, in an effort to find the best "suitable" outlet for their diverse works. This necessity to publish in other venues may be helping to eliminate compactness in agricultural communications literature (specifically in *JAC*). It can be assumed, due to the lack of compactness, that agricultural communications is offering discovery in other fields of study. However, the non-compactness of the citation structure in *JAC* reveals limited published works from within itself and creates weak self-identity. Expanding the quantity of research articles produced annually in *JAC*, and encouraging agricultural communicators to cite from previous articles in *JAC* could help with this issue.

Recommendations

Based on the findings of this study six recommendations have been formed:

1. Further research should be completed to determine the depth of *JAC* citations in other identified premier journals in agricultural education in an effort to further identify the scope and influence of *JAC* on the agricultural education discipline and its literary works.
2. Further research should be completed to better determine how various cited books influence agricultural communications. It would also be important to determine if cited books are seminal or out-of-date works.
3. It may prove valuable to determine if conference proceedings, university manuscripts, and doctoral dissertations progress to permanent literature.
4. Additional research should be completed to determine if this (premier) journal is being cited in other fields of study.

5. This study should be replicated at a ten-year cycle to assess progress the *Journal of Applied Communications*.
6. Additional research should focus on determining what drives citations in agricultural communications. Is it primarily who citers know (social structure) or what they know (intellectual structure)?

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Keywords

Journal of Applied Communications, cited literature, content analysis, citationology, interrelatedness to agricultural education

References

- Berelson, B. (1952). *Content analysis in communications research*. Glencoe, IL: Free Press.
- Bowen, B. E., Rollins, T. J., Baggett, C. D., & Miller, J. P. (1990). *Statistical procedures used in publishing agricultural education research*. Proceedings from the 44th Eastern Region Agricultural Education Research Meeting, 64-71. New Brunswick, NJ.
- Buriak, P. & Shinn, G. C. (1993). Structuring research for agricultural education: A national Delphi involving internal experts. *Journal of Agricultural Education*, 32(2), 31-36.
- Doerfert, D. L. (2003). Skate to where others are heading. *Journal of Applied Communications*, 87(4), 39-41.
- Dyer, J. E., Haase-Wittler, P. S., & Washburn, S. G. (2003). Structuring agricultural education research using conceptual and theoretical frameworks. *Journal of Agricultural Education*, 44(2), 61-74.
- Edgar, L. E., Edgar, D. W., Briers, G. E., & Rutherford, T. (2008). Research themes in agricultural education: Future gap analysis of the National Research Agenda. *Journal of Southern Agricultural Education Research*, 58(1). Retrieved September 28, 2008, from <http://pubs.aged.tamu.edu/jsaer/pdf/Vol58/58-01-061.pdf>
- Funkhouser, E. T. (2006). The evaluative use of citation analysis for communication journals. *Human Communication Research*, 22(4), 563-574.
- Garfield, E. (1998). Random thoughts on citationology: Its theory and practice. *Scientometrics*, 43(1), 69-76.
- Harder, A. & Roberts, T. G. (2006). *Seeing the forest for the trees: Authorship in the Journal of Agricultural Education*. Poster session presented at the Southern Region Agricultural Education Meeting, Orlando, FL.
- Krippendorff, K. (1980). *Content analysis: An introduction to its methodology*. Beverly Hills, CA: Sage Publications.

- Mannebach, A. J., McKenna, P., & Pfau, G. (1984). *An analysis of research methodology reported in agricultural education 1974-1982*. Proceedings of the 15th National Agricultural Education Research Meeting, New Orleans, LA.
- Miller, J. D., Stewart, D. M., & West, L. M. (2006). *Themes, authors, and citations in the Journal of Applied Communications, 2000-2004*. Paper presented at the SAAS Agricultural Communications Meeting, Quebec City, Quebec, Canada.
- Moore, G. (1991). How firm is the foundation? *A look at the knowledge base in agricultural education research*. Proceedings from the 18th Annual National Agricultural Education Research Meeting, 151-157. Orlando, FL.
- Narin, F., Carpenter, M., & Berlt, N. (1972). Interrelationships of journals. *Journal of American Society of Information Science*, 23, 32223-31.
- Osborne, E. W. (Ed.) (n.d.). *National research agenda: Agricultural education and communication, 2007-2010*. Gainesville: University of Florida, Department of Agricultural Education and Communication.
- Radhakrishna, R. B. (1995). Core journals used by agricultural and extension educators. *Journal of Agricultural Education*, 36(4), 48-54.
- Radhakrishna, R. B., Eaton, D., Conroy, C., & Jackson, G. (1994). An empirical analysis of literature cited in the Journal of Agricultural Education. *Journal of Agricultural Education*, 35(1), 61-65.
- Radhakrishna, R. B. & Jackson, G. B. (1993). Familiarity and quality of journals and importance of faculty publishing as perceived by agricultural and extension education department heads. Proceedings of the 47th Eastern Region Agricultural Education Research Meeting, 40-48. Woodstock, VT.
- Radhakrishna, R. B. & Jackson, G. B. (1995). Prolific authors in the Journal of Agricultural Education: A review of the eighties. *Journal of Agricultural Education*, 36(1), 55-63.
- Radhakrishna, R. B., Jackson, G. B., & Eaton, D. W. (1992). *Characteristics of literature cited in the Journal of Agricultural Education: An empirical study*. Proceedings of the 19th Annual National Agricultural Education Research Meeting, 272-278. St. Louis, MO.
- Radhakrishna, R. B. & Xu, W. (1997). A review of subject matter topics researched in agricultural and extension education. *Journal of Agricultural Education*, 38(3), 59-69.
- Silva-Guerrero, L. & Sutphin, H. D. (1990). Priorities for research in agricultural education. *Journal of Agricultural Education*, 31(3), 2-13.
- Tucker, M. (2004). Reply to Doerfert: A call to "skate" with caution. *Journal of Applied Communications*, 88(4), 55-57.
- Tuckman, B. W. (1999). *Conducting educational research* (5th ed.). Belmont, CA: Wadsworth Group/Thomas Learning.
- Weber, R. P. (1990). *Basic content analysis*. Iowa City: University of Iowa.