

## RESEARCH PRODUCTIVITY IN THE *JOURNAL OF AGRICULTURAL EDUCATION* FROM 1996 TO 2005

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### Abstract

*The purpose of this study was to examine research productivity in the Journal of Agricultural Education from 1996 to 2005 and explain factors that contributed to that productivity. In Volumes 37 to 46, 333 articles were published. The most productive institutions were determined by frequency of the institutional affiliation of article authors. The most productive authors were determined in a similar manner and were also ranked according to appearances as “any author” or “lead author.” A qualitative approach was then taken to develop a better understanding of the factors that contributed to that productivity. The most productive institutions were doctoral-granting institutions. Iowa State University was the leading institution and Texas A&M University closely followed. All of the productive institutions were located in the North-Central and Southern Regions of the American Association for Agricultural Education. The most productive author published 31 articles, and the most productive lead author published 15 articles as lead author. Quality research experience while a doctoral student was identified as an important factor to productivity. Participants identified intrinsic motivation as more important than external recognition and reported that departmental culture had little influence on productivity.*

### Introduction

The *Journal of Agricultural Education (JAE)* is widely recognized as the premier outlet for research conducted in agricultural education. Accordingly, an examination of this journal can provide “a good indicator of the profession’s scientific activity, philosophy and application” (Radhakrishna & Jackson, 1995, p. 55).

An argument for the use of journals as tools for research was built by Radhakrishna and Jackson (1995). Their study reviewed the productive authors in the *JAE* during the 1980s. Previous work by the same authors included an examination of the importance of publishing in journals, as perceived by agricultural and extension education department heads (Radhakrishna & Jackson, 1993) and a review of the content areas, citations, and author distribution in the *JAE* (Radhakrishna, Jackson, & Eaton, 1992). Moore (1991) looked to journal analysis in

his study of professional topics and cited authors. Despite the wealth of literature available from this time period, and a recommendation to periodically replicate the productive authors study (Radhakrishna & Jackson, 1995), little research has been conducted on the factors contributing to research productivity within the *Journal of Agricultural Education* in the past decade.

One exception to this trend was a study conducted by Kotrlik, Bartlett, Higgins, and Williams (2002) to “determine the factors that explain the research productivity among agricultural education faculty” (p. 1). Kotrlik et al. concluded the number of doctoral students advised to completion in the last five years, faculty members’ perceptions of their research confidence, and the number of graduate assistant hours allocated to a faculty member were the most important determinants of research productivity. Other variables, such as (a) percentage of time allocated to research, (b)

salary, (c) organizational culture and support of research, (d) age, (e) gender, (f) faculty rank, (g) number of master's students advised to completion in the last five years, and (h) number of years in a tenure track position were less important in determining faculty members' research productivity.

Although not an exact replication, this study builds on the previous work of Radhakrishna and Jackson (1995). Radhakrishna (1995) concluded journals were "the most important medium of scholarly communication" and the documents most often used by agricultural and extension educators (p. 50). Camp, Hillison, and Jeffreys (1987) found research, publications, and scholarship ranked second in a study of criteria affecting how agricultural teacher educators rank the programs of their peers; participants' descriptors of this second criterion included words such as "visibility" and "amount," which were linked with journal publications (p. 5). In the same study, faculty were identified as the leading criterion affecting a program's reputation. An association between the first two criteria was made by the researchers (Camp et al.). These findings suggest that agricultural educators are already accustomed to using journals as a tool for identifying reputable faculty.

Today's research climate necessitates establishing partnerships to conduct research projects due to a scarcity of resources and funding agency mandates of multi-institutional collaborations. The research productivity of an institution and of individual faculty members are criteria that could be used to identify research partners. The identification of factors associated with research productivity may help other authors develop their own skills, thus strengthening the profession's research capacity for the future.

### Theoretical Framework

This study was guided by cognitive motivation theory, which asserts that environmental and personal factors contribute to faculty productivity (Blackburn & Lawrence, 1995) and the *Causal Model of Faculty Research Productivity* that includes institutional and individual variables (Bean,

1982). Blackburn and Lawrence reported the personal factors of motivation and expectation were better predictors of productivity than sociodemographic and career variables, although the latter are predictive in the absence of motivation and expectation. Bean's model included institutional variables such as research emphasis at the institution, advanced degrees programs at the institution, and institutional reputation. Bean's model also included individual variables such as research opportunities in graduate school and current rank.

In examining sociodemographic and career variables, earlier work from Blackburn, Behymer, and Hall (1978) found faculty work environment (university) was a significant predictor of faculty research productivity. The authors further found that productive faculty continue to be productive, regardless of stage of career, and tend to increase the productivity gap between themselves and their lesser-productive colleagues. Congruently, Bailey (1992) reported faculty rank and institutional affiliation were predictive of productivity while gender was not. Tien and Blackburn (1996) found no difference between assistant and associate professors, but found full professors were more productive than their junior colleagues. Hu and Gill (2000) found having a doctoral program was predictive of a faculty member's productivity.

### Purpose and Objectives

The purpose of this descriptive, mixed-method study was to examine research productivity in the *Journal of Agricultural Education* from 1996 to 2005 and the factors which contributed to research productivity. Specifically, the study sought to:

1. Describe productive institutions in the *Journal of Agricultural Education* from 1996 to 2005.
2. Describe productive authors in the *Journal of Agricultural Education* from 1996 to 2005.
3. Describe factors that contributed to research productivity of faculty.

## Methodology

This study was quantitative and qualitative in design. The *Journal of Agricultural Education* was selected as the initial data source. The years 1996 to 2005 were chosen to present a recent view of the profession. In Volumes 37-46, 333 articles were published.

The most productive institutions were determined by conducting a frequency count of the institutional affiliation of article authors. Institutions were ranked according to the number of articles on which at least one faculty member appeared as an author (*any order*), and the number of articles on which a faculty member was listed as a *lead* author. It should be noted that credit was given to the institution listed by the author at the time of publication. It is understood the use of this criterion means some institutions received credit for research conducted at another institution, as is commonly the case for doctoral students publishing dissertation research post-graduation. The most productive authors were also ranked according to the number of articles on which an individual was listed as an author (*any order*) and the number of articles on which an individual was listed as *lead* author.

Based on the results from the second objective, individual authors were identified for an in-depth investigation using a qualitative approach to develop a better understanding of research productivity. Six of the most productive authors were purposively selected to participate in this portion of the study, five of which agreed to participate. According to Merriam (1998), "purposeful sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and, therefore, must select a sample from which the most can be learned" (p. 61). No more than two participants were selected from the same university. The following open-ended questions were asked:

1. Describe your research focus. How did you identify or arrive at this focus?
2. What kind of influence did your doctoral program have on your productivity as an author?

3. How would you describe the influence that your current department has on your productivity as an author?
4. What factors do you believe help a faculty member become a productive author?
5. What factors motivate you to publish research?
6. Is there anything you would like to add?

Dillman's Tailored Design Method (2000) was used for collecting the qualitative data. Participants were e-mailed (electronic mail) an invitation to participate in the study. The questions were e-mailed the next day. E-mail is an acceptable method for asking questions in qualitative research (Merriam, 1998).

The constant comparative method, in which participant responses are compared to each other to develop common categories, was used to analyze the data. According to Merriam (1998, p. 18), "The constant comparative method of data analysis is widely used in all kinds of qualitative studies, whether or not the researcher is building a grounded theory .... Basically, the constant comparative method involves comparing one segment of data with another to determine similarities and differences." The trustworthiness of the study was improved by efforts taken by the researchers to triangulate the data by independently reviewing the data and working as a group to reach consensus in the findings.

According to Howe (1988), quantitative and qualitative methods are inextricably intertwined. The linking of qualitative and quantitative data enables confirmation or corroboration, elaboration, and new perspective or insights (Rossman & Wilson, 1991). During analysis, qualitative data helps to validate, interpret, and clarify quantitative findings (Sieber, 1973).

## Findings

*Objective 1: Describe productive institutions in the Journal of Agricultural Education from 1996 to 2005.*

Based on the frequency of articles published in the *Journal of Agricultural*

*Education*, the most productive universities were Iowa State University, Texas A&M University, the University of Florida, and The Ohio State University (Table 1). Authors from these

four institutions accounted for 52% of the articles published from 1996-2005. Authors from Iowa State University accounted for nearly 20% of the total.

Table 1  
*Articles from Productive Universities in the Journal of Agricultural Education from 1996 to 2005*

University	Carnegie Classification	Total Articles			Lead Author Articles		
		Rank	<i>n</i>	%	Rank	<i>n</i>	%
Iowa State University	RU/VH	1	65	19.5	1	49	14.7
Texas A&M University	RU/VH	2	40	12.0	2	33	10.0
University of Florida	RU/VH	3	35	10.5	4	16	4.8
The Ohio State University	RU/VH	4	33	10.0	3	18	5.4
University of Missouri	RU/VH	5	25	7.5	6	13	3.9
Pennsylvania State University	RU/VH	6	20	6.0	5	13	3.9
Oklahoma State University	RU/H	7	16	4.8			
University of Illinois	RU/VH	8	15	4.5	8	10	3.0
Purdue University	RU/VH	9	14	4.2			
Texas Tech University	RU/H	10	12	3.6	9	9	2.7
University of Arkansas	RU/H				7	11	3.3
Cornell University	RU/VH				9	9	2.7

*Note.* Carnegie Classification, RU/VH = Research University, Very High Research Activity; RU/H = Research University, High Research Activity

The most productive universities shared several common characteristics. All but one maintained doctoral-granting programs. All were located in the Southern or North-Central Regions of the American Association for Agricultural Education. The majority of the departments had multiple faculty members. All but three of the universities had a Carnegie classification of *Research Universities with Very High Research Activity* (Carnegie Foundation, 2005). Finally, with the exception of Texas Tech University, all were land-grant institutions.

*Objective 2: Describe productive authors in the Journal of Agricultural Education from 1996 to 2005.*

The most productive author (Author 1) published 31 articles (Table 2). The most productive lead author (Author 2) published 15 articles as lead author. Any scholar with six articles as lead author was among the top ten productive lead authors, while scholars needed at least eight articles to be among the top ten productive authors in the second category.

Overall, 15 scholars were among the top ten productive lead authors and/or the top ten productive authors. Of these, 100% were men. Professorial ranks of these authors were determined by accessing online

departmental directories at the time of data collection (June 2006) and were as follows: professor emeritus ( $n = 2$ , 13%), professors ( $n = 5$ , 33%), associate professors ( $n = 5$ , 33%), and assistant professors ( $n = 3$ , 20%). All but one of the most productive authors had obtained a Ph.D.; the remaining author earned an Ed.D.

As depicted in Table 3, terminal degrees of the productive authors were most commonly received from The Ohio State University ( $n = 5$ , 33%), Iowa State University ( $n = 2$ , 13%), and University of Missouri ( $n = 2$ , 13%). The University of Florida, Oklahoma State University, Oregon State University, Texas A&M University, and Michigan State University were also represented. When examining current institutions of the productive authors, five (33%) were employed at Texas A&M University, two (13%) were at the University of Florida, and two (13%) were at Iowa State University. The remaining authors were at the University of Arkansas, Oregon State University, University of Missouri, Purdue University, the University of California at Davis, and Virginia Tech University. Thirteen of the 15 authors (87%) were currently at universities that offered doctoral degrees in agricultural education.

Table 2  
*Authorship of Productive Authors in the Journal of Agricultural Education from 1996 to 2005*

Author	Current Rank	Degree	Gender	Any Authorship		Lead Authorship	
				Rank	<i>n</i>	Rank	<i>n</i>
1	Associate Professor	Ph.D.	Male	1	31	2	13
2	Professor	Ph.D.	Male	2	21	1	15
3	Associate Professor	Ph.D.	Male	3	13		
4	Professor Emeritus	Ed.D.	Male	4	12	6	6
5	Professor	Ph.D.	Male	5	10	3	8
6	Professor	Ph.D.	Male	5	10		
7	Professor	Ph.D.	Male	5	10		
8	Associate Professor	Ph.D.	Male	8	9	3	8
9	Associate Professor	Ph.D.	Male	8	9	5	7
10	Assistant Professor	Ph.D.	Male	10	8		
11	Professor	Ph.D.	Male	10	8		
12	Professor Emeritus	Ph.D.	Male			6	6
13	Associate Professor	Ph.D.	Male			6	6
14	Assistant Professor	Ph.D.	Male			6	6
15	Assistant Professor	Ph.D.	Male			6	6

Table 3  
*Institutional Affiliations of Productive Authors*

Author	Terminal Degree Institution	Current Institution (Has a Doctoral Program in Ag Ed <sup>a</sup> )
1	University of Illinois	University of Florida (Yes)
2	The Ohio State University	Iowa State University (Yes)
3	The Ohio State University	Texas A&M University (Yes)
4	Oklahoma State University	Iowa State University (Yes)
5	University of Missouri	University of Arkansas (No)
6	The Ohio State University	University of Florida (Yes)
7	University of Missouri	Oregon State University (No)
8	Iowa State University	Texas A&M University (Yes)
9	The Ohio State University	University of Missouri (Yes)
10	Oregon State University	Purdue University (Yes)
11	Iowa State University	Texas A&M University (Yes)
12	The Ohio State University	Virginia Tech (Yes)
13	Texas A&M University	Texas A&M University (Yes)
14	University of Florida	Texas A&M University (Yes)
15	Michigan State University	University of California - Davis (Yes)

<sup>a</sup>Determined by reviewing departmental Web sites

*Objective 3: Describe the factors that contributed to research productivity of faculty.*

The participants in the qualitative portion of the study were asked to identify their research focus. Reported interests were: (a) curriculum development, (b) the integration of science into agricultural education, (c) teaching methods, (d) agricultural communications, (d) planning and needs assessments, (e) teacher education, and (f) distance learning.

Developing a research focus was a combination of *personal interest* and *opportunity*. One participant explained, "I applied for the job because this is what I was interested in and what the Department [*sic*] wanted the new faculty member to focus on."

Faculty members perceived their *doctoral programs* to be highly influential on their productivity as authors. Doctoral programs played an integral role in developing what was described as the

“knowledge and technical skills that are essential for producing publishable research.” *Opportunities to conduct research*, both under the tutelage of faculty members and through the more independent process of a dissertation, contributed to development as a researcher. *Guidance from faculty* in conducting, consuming, and presenting research was valued. One participant stated:

Faculty members [at my institution] were hugely influential in opening my eyes to the many avenues of research outside the AGED domain, which was a very important step in my development .... They taught me to be a wise consumer of research - to not accept everything I read at face value - and to look for ways to build upon all that I read.

Overall, the sentiment of participants could be expressed in the words of the faculty member who said, “you just cannot guess your way to conducting and reporting quality research. Preparation at the doctoral level is the key and poor preparation can never/never [*sic*] be overcome.”

Less agreement was expressed by study participants when asked about the influence of their current department on research productivity. *Provision of time* and *budgeted funds* allocated for research, and the *availability of research partners* were the contributing factors for participants who felt their departments were influential. One participant asserted:

Financial support is essential. I believe that there is a relationship (but by no means perfect) between the investment in a research program and the quality and quantity of output. In agricultural education, I believe that departments must have “hard money” available to support research activities.

Other participants had a divergent view about the influence of their department’s influence on research productivity. According to one participant, “I am neither rewarded or [*sic*] punished for spending countless days/nights/weekends/holidays on

[*sic*] conducting research and writing up the results. My efforts go mostly unnoticed at best.” A similar sentiment was echoed by another participant. Although he felt he was given “free reign [*sic*]” to conduct “as much research as I deem necessary to make myself happy,” he also said, “my department does not encourage sufficiently those faculty members who do not produce any research, when they should be doing so.”

Three themes emerged from the participants’ description of factors contributing to research productivity. The first, *institutional factors*, included (a) an “institutional expectation for research productivity,” (b) “a minimal level of financial support,” (c) “availability of doctoral students to assist with research,” (d) “provision of time for research,” (e) “recognition of research achievements at the local and higher levels,” and (f) “a departmental research culture.” The second theme, *research skills*, related to the practical knowledge and technical skills necessary to conduct and report quality research. The third theme was *intrinsic motivation*. It incorporated factors such as “personal satisfaction from research accomplishments,” and “genuine intrigue and commitment.”

Motivation to publish was largely influenced by a *desire for promotion and tenure*, as well as *intrinsic factors*. One participant described the role of publishing research as “essential to survival.” However, experience was related to an increased focus on intrinsic satisfaction. The same participant remarked, “I believe my productivity has far exceeded the level needed to survive. So, I attribute most of my productivity to the fact that I truly enjoy conducting and reporting research.” Others enjoyed helping students and colleagues publish research; “If I can help a graduate student and/or junior faculty member acquire those accolades, then I’m giving back a bit of what I got in my younger years.” Another participant was driven by a “Desire for others in the university and college to see that agricultural educators and the department is actively engaged in research, and to help elevate the department in the profession.” Ultimately, publishing research was motivated by a desire to



succeed and have others succeed, as well. This was evidenced by the faculty member who explained: "I thought I would be rewarded for such [publishing] and enjoyed seeing my name in print [*sic*] later on, I enjoyed helping others achieve their goals of publishing."

### Conclusions

Authors from Iowa State University published the most articles in the *Journal of Agricultural Education* between 1996 and 2005, closely followed by Texas A&M University. The University of Florida and The Ohio State University also accounted for many articles. All but three of the productive universities were *Research Universities with Very High Research Activity*. Texas Tech University, Oklahoma State University, and the University of Arkansas were *Research Universities with High Research Activity*. Texas Tech University was the only non-Land Grant institution among the top ten productive universities. Previous research had not examined productivity of universities with regards to agricultural education research, so a comparison to historical data could not be made. However, Blackburn, et al. (1978) and Bean (1982) reported that the university at which a faculty member worked influenced productivity.

The most productive institutions (according to lead author) nearly all had doctoral programs in agricultural education, with the exception of the University of Arkansas. While doctoral students do contribute to the knowledge base of the *JAE*, publication credit typically does not go to their alma mater, as the new faculty member usually lists their employing institution. Yet these findings may substantiate the conclusions made by Hu and Gill (2000) and Kotrlik et al. (2002) that research productivity is related to successfully advising doctoral students to completion.

Nearly one-third of the articles with authors from Iowa State University involved the same author. Although the most productive universities tended to have larger faculties, this author alone would have ranked sixth on the institutional rankings determined by "any author" and fifth on the

rankings determined by "lead author." So, although it may help to be part of a larger department where institutional obligations such as service on committees is shared, it is evident that one productive faculty member can create a large impact.

The most productive author in the "any author" category had 31 articles, nearly double of the most productive author reported by Radhakrishna and Jackson (1995). However, this author was lead author on only 13 articles, demonstrating a commitment to partnering with others. The willingness to jointly author articles is a distinguishing characteristic of agricultural and extension education (Radhakrishna & Jackson). This may be useful to note for faculty or graduate students considering potential partners for joint research projects, but was not a major theme identified by most of the productive authors as a key factor in their success.

All of the most productive authors were men, which seems to contradict Bailey's (1992) finding that found gender was not predictive of productivity. This is more likely a reflection of a traditionally male work force rather than evidence of a relationship between gender and authorship. With more women entering the profession, future reviews of authorship may find a more equitable gender balance. In fact, a female scholar narrowly missed being among the top ten most productive *JAE* authors, falling one article short.

Also notable was the distribution of productive authors over all ranks of the professoriate. The findings from this research indicated that 33% of the most productive authors were professors and 33% were associate professors. This contradicts Tien and Blackburn's (1996) finding that professors were more productive than their junior colleagues, but was more balanced than what Radhakrishna and Jackson (1995) found during the 1980s, when 50% of the most productive authors were professors and only 11% were associate professors. Additionally, there were no assistant professors who were defined to be productive in Radhakrishna and Jackson's study, but assistant professors accounted for 20% of the most productive authors from 1995-2005.

Organizational/departmental culture had little influence on the author's productivity, which was consistent with the findings of Kotrlik et al. (2002). This finding contrasts that of Blackburn et al. (1978), who found that the faculty work environment (university) was influential. Intrinsic motivation was more important to this study's participants than external recognition. This finding is congruent with that of Blackburn and Lawrence (1995). Participants did appreciate external recognition, particularly as new professors, but found it less rewarding than intrinsic motivators. The study by Kotrlik et al. did not investigate the effects of intrinsic rewards on motivation to conduct research.

### Implications/Recommendations

Perhaps the most apparent implication from this study affects institutions with doctoral programs. It is clear that a well-run doctoral program is an advantage for both students and faculty. Institutions should strive to create a course structure that emphasizes the technical skills that students will need for a productive research career, while providing practical experience on faculty-led projects. Scheer, Ferrari, Earnest, and Connors (2006) presented a model for a course structure in Extension Education at The Ohio State University, which could be utilized as a starting point for conversations at other universities. As students gain in confidence, they will be able to take a more independent role as researchers in future projects. Conducting collaborative research may be essential career preparation for students with faculty positions in mind.

Another distinguishing feature of the most productive institutions was their locations in the North-Central and Southern Regions of the American Association for Agricultural Education. Again, indications point to department size as a contributing factor for this finding. While departments tend to be larger in the regions represented, it is not uncommon to have single member departments in the Western region. This is another compelling reason to consider research partnerships between universities. Joint studies between universities can offer opportunities to extend the resources of a

smaller department and add new perspectives to a larger one.

The continued productivity of graduates from The Ohio State University is notable, with that school reported as the doctoral alma mater by one-third of the most productive faculty in agricultural education. This was congruent with Radhakrishna and Jackson (1995), who found that 33% of the productive authors of the 1980s had earned their terminal degrees from The Ohio State University. It seems evident that a commitment to a strong research tradition learned during a doctoral program can be retained as graduates move into faculty positions at other universities.

The qualitative responses strongly supported this implication and may warrant the development of the following hypothesis: quality research experience at the doctoral level is an important factor in a faculty member's future productivity as an author. The identification of a faculty member's confidence in their research abilities as a significant factor in productive authorship supports the development of this hypothesis (Kotrlik et al., 2002). As was noted by several participants in this study, research experience as a doctoral student can be beneficial for developing confidence. This was consistent with the research productivity of faculty in other disciplines (Bean, 1982; Blackburn et al., 1978).

This study leads to several recommendations regarding potential research partners. First, faculty seeking collaborators should look towards associate and full professors from larger departments at *Research Universities with Very High Research Activity*. Secondly, as evidenced in this study, faculty can benefit from the presence of doctoral students. Not only should faculty members looking to increase their research productivity consider partnerships with other faculty members, it is recommended that doctoral students also be considered as contributors. This may be especially important for faculty working in small departments; doctoral students may substitute as research partners. Such a relationship has a reciprocal nature, as the faculty member is provided assistance in publishing while the students gain critical experience in research.

In general, the results of this study could serve as a useful guide for identifying research-oriented institutions and faculty members for future research projects. It is recommended that this study be expanded to include other journals of the profession to establish a more thorough understanding of agricultural and extension education research, such as the *Journal of International Agricultural and Extension Education*, *Journal of Extension*, and the *Journal of Southern Agricultural Education Research*. Future studies should also examine the theoretical/conceptual frameworks and contextual applications of agricultural and extension education research to determine the focus of the disciplines and provide additional foundation for future scholarship.

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