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Theoretical Perspectives of Research Output based on Literature Review

*** R. Lalengmawia and ** Dr. Akhandanand Shukla#**

*****Research Scholar, Department of Library & Information Science, Mizoram University, Aizawl (India); Email: engmoia.ralte@gmail.com

****** Assistant Professor, Department of Library & Information Science, Mizoram University, Aizawl (India); Email: akhandanandshukla@gmail.com; Orcid id: http://orcid.org/0000-0001-7157-5600
# Corresponding author

Abstract

Paper deals with the theoretical perspectives of research output defined by various scholars during the different time frame and different situations. The theoretical discussions on research output are based on the review of literature available in the field. The definitions of research output along with measurement of research output have been discussed in the paper. Further, faculty research output models given by various scholars have been discussed thoroughly. Moreover, individual, institutional and leadership characteristics that facilitate research output have been also elaborated followed by the conclusion.

Keywords: Research Output, Research Productivity, Research Measurement, Research Output Model, Quality Measurement, Quantity Measurement.

1. Introduction

In recent years, there has been increasing interest among researchers and policy makers in the notion of research output. Research output is one of the major measures of university academic performance and a core indicator for calculations of university rankings. A number of studies have tried to compare research output across countries or academic disciplines and to explore the main factors that enhance the research output of faculty members. Research plays a critical role in promoting the prosperity of a nation and the well-being of its citizens. Universities through research make important contributions to the growth and development of industries and government businesses, thereby promoting national and global development. One of the strategies for determining research output is to assess the number of publications which researchers communicated through primary or other sources. Research output and research activity are inter-related. Research involves collecting and analyzing data. Output results from writing, reading and publishing research reports in professional refereed journals, and displaying it on the web, or to making it known to the public through any other means.

According to Creswell (1986), research output is the extent to which lecturers engage in their own research and publish scientific articles in refereed journals, conference proceedings, writing a book or a chapter, gathering and analyzing original evidence, working with postgraduate students on dissertations and class projects, obtaining research grants, carrying out editorial duties, obtaining patents and licenses, writing monographs, developing experimental designs, producing works of an artistic or a creative nature, engaging in public

debates and commentaries. For the purposes of this investigation, it is important that the notion of 'research output' be carefully defined, since it is a key element in the development of the research question. To begin, 'Research' means the careful study or investigation, especially in order to discover new facts or information (Oxford University, 1995). 'Output' means the total production compared with inputs or consumption over the same period of time, which serves as a measure of whether the producer's production processes are working efficiently (Witzel, 1999). However, in combining the two words as 'research output', a simple definition becomes more difficult in a research environment because different people have very different perceptions about its meaning.

Most of the methods for measuring research output involve measuring the number of journal articles published. Research output has been mentioned in several studies relating to higher education. The most pervasive issue regarding the measurement of research output is the confusion of quantity of publications with the quality of publications, either in the publications themselves or in the publication outlets (Lawrence & Green, 1980). Print and Hattie (1997) highlighted the value of publications as the most direct measure of research performance. These include articles in refereed journals, commercially published peer-reviewed books, major refereed conference presentations, papers in refereed conference proceedings, articles weighed by journal citation impact, competitive peer-reviewed grants, postgraduate research degrees supervised to completion, and editor/editorial board of recognized journals. Demographic variables have generally been associated with research output. Age has been studied in numerous works, with conflicting results. Many studies about output have indicated that the relationship between publication and age is not linear, although the overall rate of publication generally declines with age (Finkelstein, Seal & Schuster, 1998; Teodorescu, 2000).

According to Over (1982), research output of academics slightly decreased with age. Bland and Berquist (1997) also observed that the average output of academic members' drops with age but many senior academics remains active and that there is no significant evidence that age determines a drop in output. Research output is an outcome measurement of scholarly effort (Jacobs, Hartgraves & Beard, 1986; Kurz et al., 1989), and has two components that are (i) knowledge creation (research), and (ii) knowledge distribution (productivity) (Gaston, 1970). For the most part, the 'product' of academic lecturers' research is the scholarly publication (Carnegie Foundation, 1991). The importance of this definition of research output is that it enables faculty members to share insights, demonstrate academic scholarship, gain recognition for creative thinking, and finally to develop a reputation for expertise in a specialty area (Rhodman, 2002). Taking a slightly wider view, research output can include research publication in professional journals and in conference proceedings, writing a book or chapter, gathering and analysing original evidence, working with post-graduate students on dissertations and class projects, obtaining research grants, carrying out editorial duties, obtaining patents and licenses, writing monographs, developing experimental designs, producing works of an artistic or creative nature, engaging in public debates and commentaries (Creswell, 1986).

However, research is typically a private and self-mastered activity, and it can be difficult for university staff members to balance an effective project agenda with the demands of teaching, service, and life in general. According to Boice (1987), productivity should emerge from hard work, and a fair schedule for research activity should utilize a benchmark that encourages a struggling researcher to relate to their current level of activity. For example, Boice (1987) found that a new faculty member who could find only one hour per weekday to work on their

research generally managed to submit about 1.5 manuscripts per year, which is then consistent with the expectations for a pay rise and higher tenure status. Furthermore, faculty members who adopt a regimen of brief daily periods for research projects typically experience less stress in managing their time and their lives (Boice, 1987).

2. Measurement of Research Output

The most pervasive issue regarding the measurement of research output is the confusion of quantity of publications with the quality of publications, either in the publication itself or the publication outlet (Lawrence & Green, 1980). Indeed, it has been noted that the debate over the most appropriate measure of output revolves around these two fundamental dimensions of quantity and quality (McGuire et al., 1988). Furthermore, whilst research output can be measured at the individual level, there is also a need to develop hierarchical measures at the sub-department, department and university levels.

2.1 Quantity Measurement

The most frequently used measure of the quantity or amount of research output is a numerical publication count or the journal article count over a certain time period. The activities included in measuring output range from a narrow perspective of 'number of research articles published' to a broad interpretation which consists of presentations, both formal and informal, number of graduate students that a staff member is advising, publications of any type and proposals submitted for funding. Moreover, it also includes counts of the number of editorial duties, conference deliveries, licenses, patents, monographs, books, experimental designs, and works of an artistic or creative nature, public debates and commentaries (Creswell, 1986). Rotten (1990) stated that a common approach to measuring research output was to count the number of books, articles, technical reports, bulletins, and book reviews published, as well as presentations given and grants received through reviewing curriculum vitae or other print materials.

Fielden and Gibbons (1991) pointed out that within the business faculty, many lecturers emphasize articles published in refereed journals and trivialize all other measures of output. Clement and Stevens (1989) found that management administrators put greater weight on scholarly research and less on trade and newspapers articles than their non-management business peers. Radhakrishna and Jackson (1993) reported that publishing in refereed journals was ranked as the most important factor in research output, and Radhakrishna, Yoder, and Scanlon (1994, p.17) noted that 'publication (in refereed articles in journals and paper presentations at a conferences) are considered to be a very important component of faculty output." This statement was supported by Kotrlik et al. (2002) in reference to Personal Communication from William J. Cooper, former Dean of the Louisiana State University Graduate School. Kotrlik et al. (2002) quoted William Cooper as stating that 'the only magic number is zero; if you haven't published in refereed journals, then publications in research conference proceedings, books, and other publications are meaningless' (p.3).

To further illustrate the complexity of this task of determining research output, faculty publication counts can either be 'straight counts' or 'weighted counts' (Collins, 1993). It has been suggested that perhaps the easiest way to gather counts is to ask respondents to self-report the number of publications produced for a particular period of time. However, counting all publications equally may be simplistic because it ignores the quality of the publication. One method of adding quality into self-reported counts is to define eligible publications carefully. Faculty members can be asked to list non-refereed publications

separately from refereed journals. Single-authored papers can be distinguished from multiple-authored ones. The types of publications, for example, journal articles, books, monographs, or book reviews, can also be easily distinguished (Brocato, 2001). Furthermore, Creswell (1986) seriously pointed out that counts of publication need some form of weighting system, particularly, for instance, the comparisons between journal articles and books. Books demonstrate a problem because there are several types of books that cannot be used to measure research performance, such as original scholarly books, theoretical or research monographs, edited books, and textbooks. A chapter in a book for readings may also be classified as a book form. Further problems also could arise when equal weight is given to many of the peer-reviewed publications in newer journals whose review standard may be less rigorous than the longer established journals. Several weighting systems have developed to make comparisons among types of research output. Braxton and Toombs (1982) used an objective method of weight assignment by using a panel of scholars of the academic profession or of graduate education to make the assessment when weighting output. The judges were asked to rate the publications on a scale of zero to ten. The median ratings obtained were then used to construct a scale of the weights. The results of this weighting procedure show that original scholarly books and monographs receive higher weights than do journal articles. Textbooks are also weighted higher than edited books, whereas edited books are weighted equally with articles published in high-quality journals but higher than articles published in journals of lower perceived quality (Creswell, 1986).

The special characteristics of the various journals also affect the weighting system. An article published in a refereed journal is assessed and certified as a contribution to knowledge because refereed journals are putative ‘prestige' journals, supervising the review of the manuscript by experts in the field. Thus, articles published in refereed journals may be assessed higher than articles in non-refereed journals (Miller & Serzan, 1984). However, there are also unpublished research outcomes that are recognized as a form of productivity. For example, papers presented at professional meetings and the final reports of funded research are significant types of unpublished research. Weights for these items may also be needed because a grant from the National Science Foundation is perceived as having more value than one received from an institutional research fund. Furthermore, the prestige of professional associations also varies with their geographical location. For instance, a paper presented at the national association conference may have more prestige than the one presented at a regional meeting (Creswell, 1986). Lastly, service as a reviewer of grants proposals is another pertinent measure (Pellino, Blackburn & Boberg, 1984). The simple counting of published and unpublished research outcomes does not allow any comment on the quality of work. For examination of quality, peer review rating and citation analysis are emerging as relatively new tools to assess the value of the contributions of research to the discipline.

2.2 Quality Measurement

Peer review refers to a process whereby one or more qualified persons professionally peer review a person’s work, generally for publication in a scholarly journal or book (Upali, Hebert & Nigel, 2001). External reviewers for academic journals typically do not know the names of the authors of manuscripts that they are asked to review. However, the case of assessing grant proposals may be different, because the peer review process in grant proposals has considerable interest in what are the particular characteristics of the researcher (viz. age, gender, rank, potential conflicts of interest) (Chubin, 1994). Kirkpatrick and Locke (1992) found a statistically significant positive correlation between individual peer rating and

measures based on article counts and citation counts. However, peer ratings are not without their limitations, for example, it can be influenced by the personality of the scholar being judged and/or by the prestige of the institution of affiliation (Folger, Astin & Bayer, 1970). Similarly, Nelson, Buss and Katzko (1983) argued that peer review has several other limitations like: (i) the quality of the personal work is not being measured in peer reviews, (ii) journals different in scope of articles published because some journals may concentrate on contribution to knowledge while others may focus on more creative contributions, and (iii) peer rating is affected by rapid changes of editorial staff and publishing policies.

Citation measurements have been used to measure faculty research output (Braskamp & Ory, 1994; Creamer, 1998). Indeed, Centra (1981) claimed that citation data better reflects the impact of faculty work. One way of gathering citation data is by obtaining curriculum vitae from faculty and verifying listed citations via citation abstracts and databases (Brocato, 2001). Published works are cited as building blocks for ideas, concepts, findings, methods or information on instrumentation. Some are cited for negative purposes or for perfunctory reasons (Creswell, 1986). Nevertheless, in a cited article, not everything is read and found useful. A publication is a property, and citing practice is a social device for coping with problems of property rights and priority claims (Kaplan, 1965). However, citation counts have some important limitations (Creswell, 1986; Brocato, 2001). First, there are substantial differences in citation rates among various disciplines because of the rates of publication and the acceptance rates of journals. Second, significant research may not be recognized for a considerable period of time, but a scholar who has published a number of pieces in a fixed period of time might expect to generate at least a few citations. Citation rates decay substantially (Line, 1984), thus staff who work for a longer period of time generally have more publications and more opportunity to be cited. Consequently, citation counting must be a restricted compilation to a fixed span of time in both citation sources and the citation documents. Third, a scholar who is a junior author of a piece, and therefore not the first name, would be missed in simple counts. Fourth, some surnames are subject to common misspelling by citing authors, and these errors are preserved in the citation indexes. Fifth, citations may be for criticisms and rejections of research rather than its merit and utility. Sixth, several critics of citation tools have noted that self-citations and citation of friends' work may distort the realistic measurement. Finally, citation counts do not distinguish between positive and negative comments about the work. Furthermore, citation indices are subject to a long lag-time because of the long peer review and publication process.

It has been noted that the quality measure of research output is not as frequently used as simple counts since the cost of gathering information on the citation is quite considerable (Wanner, Lewis & Gregorio, 1981). In addition, the correlation range between citation counts and publication counts are only 0.6 to 0.72 (Cole & Cole, 1967).

3. Models of Faculty Research Output

Numerous studies on faculty research output identify the consistent set of facilitating characteristics that have an impact on faculty research output. A few authors have grouped these characteristics into clusters or models to understand the major factors that affect research output and to begin to identify a model that explains faculty research output. Bland et al. (2002) model used in the study builds on earlier models, as is illustrated by the following discussion of earlier attempts to cluster disparate characteristics into explanatory models. Finkelstein (1984) suggested that seven critical variables predict faculty publication rates: faculty researchers having a research orientation, the highest terminal degree within a

field, early publication habits, previous publication activity, communication with disciplinary colleagues, subscriptions to a large number of journals, and sufficient time allocated to research. Finkelstein's early model of research output is useful because it provides an initial picture of the attributes of a successful researcher at the individual faculty level. However, Finkelstein's model does not clearly articulate the institutional factors that affect faculty research output. Creswell's model begins to account for some institutional factors affecting faculty research output. He described successful researchers as those who tend to hold a senior professor rank, spend at least one-third of their time on research activities, publish early in their careers, receive positive feedback from peers for research efforts, and maintain regular and close contact with colleagues on and off campus who conduct research on similar topics. Creswell's model extends beyond individual characteristics by acknowledging that faculty researchers are more productive when they are employed by a major university that rewards research and assigns ample time for faculty to conduct research. Thus, Creswell's model acknowledges the importance of the institution and the research culture within that institution on an individual faculty's research output.

Dundar and Lewis (1998) proposed a model in which faculty research output is primarily associated with two attributes: individual attributes that relate to personal traits and environmental experiences and institutional and departmental attributes that entail variables related to leadership, culture, structure, and policies. Based on a study of more than 3,600 research– doctoral programs in the United States, they found that one of the most significant predictors of faculty research productivity is faculty-group size. Other features included such things as being a private rather than a public institution, having a larger number of full professors, and having a larger percentage of faculties within a department actively publishing in peer-reviewed journals. Teodorescu (2000) proposed an international model of faculty research publication output. Teodorescu's model asserted that individual achievement variables and institutional characteristic variables would predict faculty research output across national boundaries. In a test of this model across ten nations, he found that, although correlates of faculty research output varied across national boundaries, faculty involvement in disciplinary affiliations (such as membership in professional societies and attendance at professional conferences) was significantly related to research output across all countries.

A fifth model by Brocato (2001) proposed that faculty research output in the context of medical school family practice departments is related primarily to the broad factors of early research socialization, individual faculty's psychological and demographic characteristics, and the institutional and departmental research environments. He found that individual faculty's characteristics, such as motivation, professional networks, and research training, were highly correlated to research output. He also determined that institutional, departmental, and disciplinary characteristics had a much lower impact on faculty research output, especially in relation to the individual faculty's characteristics. Bland et al. (2002) synthesized the literature on faculty research output into a model that asserts high research output is strongly associated with eight individual characteristics, fifteen institutional characteristics, and four leadership characteristics. This model has evolved through its application in several studies, as noted earlier. In the Bland et al. (2002) model, faculty research output is highest when a faculty member has specific individual qualities, works in an institution that is highly conducive to research and is led by someone who possesses essential leadership qualities and uses an assertive–participatory management approach.

Further, the Bland et al. (2002) model suggests a hierarchical order to these three sets of qualities i.e. the individual characteristics are essential, but they have more or less power in

assuring faculty research output depending on how research-conducive the faculty member's institution is. Finally, the impact of the institution is mediated by the qualities and style of the leader. Many of the individual-level characteristics and institution-wide features that facilitate faculty research output are already present in most established research-oriented universities. For example, in such institutions research is consistently emphasized in the mission and the promotion and tenure structure. Also, most faculties in these institutions have individual characteristics, such as holding the highest terminal degree in their field, being tenured, and holding the highest rank. In addition, these faculties have most of the other individual characteristics of a productive researcher, such as being driven to do research, socialized to the research culture, and well-grounded in basic content knowledge and research skills. So, although the above-cited literature is useful to institutions such as these, it is not specific enough to inform decisions about what would further facilitate the faculty's research output.

4. Individual, Institutional and Leadership Characteristics that Facilitate Research Output

Hanover Research (2014) examined the successful practices for developing a culture of research in higher education. They have categorized the research productive environment into following three categories:

4.1 Individual Characteristics

- Socialization: Understands the values, norms, expectations, and sanctions affecting established faculty (e.g., beneficence, academic freedom).
- Motivation: Driven to explore, understand, and follow one's own ideas, and to advance and contribute to society through innovation, discovery, and creative works.
- Content knowledge: Familiar—within one's research area—with all major published works, projects being conducted, differing theories, key researchers, and predominant funding sources.
- Basic and advanced research skills: Comfortable with statistics, study design, data collection methods, and advanced methods commonly used in one's area.
- Simultaneous projects: Engaged in multiple, concurrent projects, so as to buffer against disillusionment if one project stalls or fails.
- Orientation: Committed to both external activities (e.g., regional and national meetings, collaborating with colleagues) and activities within one's own organization (e.g., curriculum planning, institutional governance).
- Autonomy and commitment: Has academic freedom, plan one's own time and sets one's own goals, but is also committed to and plays a meaningful role within the larger organization.
- Work habits: Has established productive scholarly habits early on in one's career.

4.2 Institutional Characteristics

- Recruitment and selection: Great effort is expended to recruit and hire members who have the training, goals, commitment, and socialization that match the institution.
- Clear coordinating goals: Visible, shared goals coordinate members' work.
- Research emphasis: Research has greater or equal priority than other goals.
- Culture: Members are bonded by shared, research-related values and practices, have a safe home for testing new ideas.
- Positive group climate: The climate is characterized by high morale, a spirit of innovation, dedication to work, receptivity to new ideas, frequent interactions, the

high degree of cooperation, low member turnover, good leader/member relationships, and open discussion of disagreements.

- Mentoring: Beginning and mid-level members are assisted by and collaborate with established scholars.
- Communication with the professional network: Members have a vibrant network of colleagues with whom they have frequent and substantive (not merely social) research communication, both impromptu and formal, in and outside of the institution.
- Resources: Members have access to sufficient resources such as funding, facilities, and especially humans (e.g., local peers for support, research assistants, and technical consultants).
- Sufficient work time: Members have significant periods of uninterrupted time to devote to scholarly activities.
- Size/experience/expertise: Members offer different perspectives by virtue of differences in their degree levels, approaches to problems, and varying discipline backgrounds; the group is stable, and its size is at or above a "critical mass."
- Communication: Clear and multiple forms of communication such that all members feel informed.
- Rewards: Research is rewarded equitably and in accordance with defined benchmarks of achievement; potential rewards include money, promotion, recognition, and new responsibilities.
- Brokered opportunities: Professional development opportunities are routinely and proactively offered to members to assure their continued growth and vitality.
- Decentralized organization: Governance structures are flat and decentralized where participation of members is expected.
- Assertive participative governance: Clear and common goals, assertive and participative leadership where active participation of members is expected and effective feedback systems are utilized.

4.3 Leadership Characteristics

- Scholar: Highly regarded as a scholar; serves as a sponsor, mentor, and peer model for other group members.
- Research oriented: Possesses a "research orientation"; has internalized the group's research-centered mission.
- Capably fulfills all critical leadership roles:
  - Manager of people and resources
  - Fund-raiser
  - Group advocate
  - Keeps the group's mission and shared goals visible to all members
  - Attends to the many individuals and institutional features that facilitate research output
- Participative leader:
  - Uses an assertive, participative style of leadership
  - Holds frequent meetings with clear objectives
  - Creates formal mechanisms and sets expectations for all members to contribute to decision making
  - Makes high-quality information readily available to the group
  - Vests ownership of projects with members and values their idea

5. Conclusion

Research is a continuous process; its outcome appears in various forms, mainly in physical form and popularly known as research output. Research output has been defined by various scholars in different ways and in the different context. Research output can be measured quantitatively as well as qualitatively. The quantitative measurement of research output has not been considered as "good" for research development by scientists and scholars even it is very simple to count the research output of an individual or an institute. Qualitative measurement of research output is considered as "good" comparatively but still challengeable to prove the quality of the research. No other way is available (third suitable option) till now to measure the research output. Various models for increasing research output have been discussed but no common and widely accepted model is available till now. It is true that conducive environment, highly qualified faculty, higher salary package, research linked promotion for faculty, better laboratory environment, and good researchers increase the research output of the individual researchers. Personal factors, leadership skills, and institutional factors affect deeply the research output of an individual. To boost up the quality research output, governmental as well as institutional policies should be framed in such a way that supports and motivate the research activities of the individual researcher.

References

1. Bland, C. J., & Bergquist, W. H. (1997). *The vitality of senior faculty members: Snow on the roof, fire in the furnace*. Washington, DC: Graduate School of Education and Human Development, George Washington University.
2. Bland, C. J. et al. (2002). One school's strategy to assess and improve the vitality of its faculty. *Academic Medicine, 77*, 368 -376.
3. Boice, R. (1987). Habits of research productivity. *Accounting Education News*. Late Fall, 7.
4. Braskamp, L. & Ory, J. (1994). *Assessing faculty work: enhancing individual and institutional performance*. San Francisco: Jossey-Bass Publishers.
5. Braxton, J., & Toombs, W. (1982). Faculty uses of doctoral training: consideration of a technique for the differentiation of scholarly effort from research activity. *Research in Higher Education, 16*(3), 265-286.
6. Brocato, J. J. (2001). *The research productivity of family medicine department faculty: a national study* [Dissertation]. Michigan State University.
7. Carnegie Foundation. (1991). The payoff for publication leaders. *Change*, 27-30.
8. Centra, J. (1981). Research productivity and teaching effectiveness. Retrieved on November 2015 from ERIC Document Reproduction Service database.
9. Chubin, D. (1994). Grants peer review in theory and practice. *Evaluation Review, 18*, 20-30.
10. Clement, R. & Stevens, G. (1989). Performance appraisal in higher education: Comparing department of management with other business units. *Public Personal Management*, 18, 263-278.
11. Cole, S. & Cole, J. (1967). Scientific output and recognition: a study in the operation of the reward system in science. *Human Sociological Review, 32*, 377-399.
12. Collins, B. (1993). A review and integration of knowledge about faculty research productivity. *Journal of Professional Nursing, 9*, 159-168.
13. Creamer, E. (1998). *Assessing faculty publication productivity: issues of equity*. George Washington University, USA.

14. Creswell, J. W. (1985). *Faculty Research Performance: Lessons from the Sciences and Social Sciences*. Washington, DC: Association for the Study of Higher Education.
15. Creswell, J. W. (1986). *Measuring faculty research performance*. San Francisco: Jossey-Bass.
16. Dundar, H. & Lewis, D. R. (1998). Determinants of research productivity in higher education. *Res Higher Education, 39*, 607–31.
17. Fielden, J. & Gibbons, J. (1991). Merit myopia and business school faculty publications. *Business Horizons, 34*(2), 8-12.
18. Finkelstein, M., Seal, R., & Schuster, J. (1998). *The new academic generation: A profession in transformation*. Baltimore: Johns Hopkins Press.
19. Finkelstein, M. J. (1984). *American Academic Profession: A Synthesis of Social Scientific Inquiry since World War II*. Columbus: Ohio State University Press.
20. Folger, J., Astin, H., & Bayer, A. (1970). *Human resource and higher education*. Russell Sage Foundation: New York.
21. Gaston, J. (1970).The reward system in British Science. *American Sociological Review, 35*, 718-732.
22. Hanover Research (2014). *Building a culture of research: recommended practices*. Retrieved January 4, 2018 from http://www.hanoverresearch.com/media/Building-a-Culture-of-Research-Recommended-Practices.pdf
23. Jacobs, F., Hartgraves, A., & Beard, L. (1986). Publication productivity of doctoral alumni: a time adjusted model. *The Accounting Review. 61*, 179-187.
24. Kaplan, N. (1965). The norms of citation behavior: prolegomena to the footnote. *American Documentation, 16*, 179-184.
25. Kirkpatrick, S., & Locke, E. (1992). The development of measurement of faculty scholarship. *Group & Organization Management, 17*, 5-23.
26. Kotrlik, J., Bartlett, J., Higgins, C., & Williams, H. (2002). Factors associated with research productivity of agricultural educational faculty. *Journal of Agricultural Education, 43*(3), 1-10.
27. Kurz, R., Mueller, J., Gibbons, J., & DiCataldo, F. (1989). Faculty performance: suggestions for the refinement of the concept and its measurement. *Journal of Higher Education, 60*, 43-58.
28. Lawrence, J., & Green, K. (1980). *A question of quality the higher education rating game*. American Association for Higher Education: Washington DC.
29. Line, M. (1984). Citation decay of scientific papers: variation according to citations received. *Journal of Information Science, 9*, 90-91.
30. McGuire, J., Richman, M., Daly, R., & Jorjani, S. (1988). The efficient production of reputation by prestige research universities in the United States. *Journal of Higher Education, 59*, 365-389.
31. Miller, A., & Serzan, S. (1984). Criterion for identifying a refereed journal. *Journal of Higher Education, 55*(6), 763-699.
32. Nelson, T., Buss, A., & Katzko, M. (1983). Rating of scholarly journal by chairpersons in the social sciences. *Research in Higher Education, 19*, 469-497.
33. Oxford University. (1995). *Oxford Advanced Learner's Dictionary (7th ed.)*. Oxford University Press: New York.
34. Over, R. (1982). Does research productivity decline with age. *Higher Education. 11*, 511-520.
35. Pellino, G., Blackburn, R., & Boberg, A. (1984). The dimensions of academic scholarship: faculty and administrator views. *Research in Higher Education, 20*(1), 103-115.

36. Print, M., & Hattie, J. (1997). Measuring quality in universities: An approach to weighting research activity. *Higher Education, 33,* 453-469.
37. Radhakrishna, R. B., & Jackson, G. (1993). Agricultural and extension education department heads perceptions of journals and importance of publishing. *Journal of Agricultural Education, 34,* (4), 8-16.
38. Radhakrishna R. B., Yoder, E., & Scanlon, D. (1994). Determinants of faculty productivity: Perspectives of agricultural and extension education faculty. Paper presented at the National Agricultural Education Research Meeting, December 1994. Retrieved on 9th September 2015 from ERIC Document Reproduction Service database.
39. Rhodman, A. (2002). The effects of academic origin and academic affiliation on research productivity: an empirical investigation of information system faculty [Doctoral Dissertation]. Mississippi State University, USA.
40. Rotten, J. (1990). Research productivity, course load, and ratings of instructors. *Perceptual and Motor Skills, 71,* 1388.
41. Teodorescu, D. (2000). Correlates of faculty publication productivity: A cross-national analysis. *Higher Education. 39,* 201-222.
42. Upali, W., Hebert, W., & Nigel, B. (2001). Peer review in the funding of research in higher education: the Australian experience. *Educational Evaluation and Policy Analysis, 23*(4), 343-364.
43. Wanner, R., Lewis, L., & Gregorio, D. (1981). Research productivity in academia: sciences and humanities. *Sociology of Education, 54,* 238-253.
44. Witzel, M. (1999). *Dictionary of Business and Management*. International Thomson Business Press: England.

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