Scholarly Metrics by Rank in the Agricultural Education Discipline

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While research productivity and impact have been standard measurements in the hiring, promotion, and tenure of faculty members (Kotrlik et al., 2002; Moher et al., 2018), Schimannski and Alperin (2018) reported that over time, the importance of research in making personnel decisions has increased. Furthermore, research productivity has served as a valuable way to determine the academic prestige of researchers, institutions, and disciplines (Birkenholz & Simonsen, 2011; Burris, 2004). Historically, research productivity was assessed by counting the number of publications by a researcher (Kotrlik et al., 2002); however, many institutions now emphasize impact factor metrics such as h-index and i10 index (Moher et al., 2018). The h-index measures the quality and quantity of research output, defined as "the highest number of publications of a scientist that received h or more citations" (Schreiber, 2008). The i10 index is a Google Scholar-specific metric measuring the number of articles published and cited at least 10 times. These factors are a way of measuring research output; however, interpreting these metrics can be difficult, especially without a baseline for comparison. As such, the purpose of this study was to describe research productivity within the discipline of Agricultural Education by h-index, i10 index, and total citations among the Assistant, Associate, and Professor ranks. Findings from this study have the potential to provide AAAE members with data to assess their own research productivity within the discipline.

Theoretical Framework

The theoretical framework underpinning this study was Vroom's (1964) expectancy theory. According to this theory, there are three influences on motivation: valence, expectancy, and instrumentality; Porter and Lawler (1968) added role perception as a fourth element. Expectancy is a person's judgement that increased effort will result in increased performance; instrumentality is the belief the increased performance will result in the desired outcome; valence is the importance an individual placed on the desired outcome. Lastly, role perception describes the actions one must take to achieve desired outcomes. In the context of this study, the desired outcome is advancement in rank and the comparative data provides the necessary information on role perception across academic ranks.

Methodology

To collect data for this descriptive study, we first identified all AAAE members listed on the online directory with public Google Scholar profiles. Google Scholar profiles were found for 48 Assistant, 42 Associate, and 38 Professors ($N = 128$). Professorial ranks were determined by looking up AAAE members on university websites. Individual member metrics including h-index, i10 index, and total citations were collected from each member's Google Scholar profile and entered into a spreadsheet. Years since first publication was determined by counting years since the individual's dissertation publication to present. Individual citations per year were calculated using total career citations and years since first publication. To minimize variations in cited works, data were collected over two days on October 14 – 15, 2023. For each professorial rank metrics were described by mean, standard deviation, and confidence intervals.

Findings

Table 1 shows the mean, standard deviation, and 95% confidence interval for each scholarly metric by rank. There were distinct, well-defined demarcations and a considerable increase in

research productivity across the ranks. Of note, the 95% confidence intervals for h-index and total citations did not overlap, indicating significant ($p < .05$) differences between ranks. However, there was an overlap with the i10-index and citations per year between assistant to associate and associate to professor.

Table 1

Publication Metrics by Professorial Rank

	Assistant (n = 48)		Associate (n = 42)		Professor (n = 38)	
	M	95% CI	*M*	95% CI	*M*	95% CI
i10 Index	4.23 (6.50)	[2.34, 6.11]	22.12 (54.93)	[5.00 39.24]	34.29 (21.14)	[27.34, 41.24]
h-Index	5.69 (5.02)	[4.23, 7.15]	10.83 (3.99)	[9.59, 12.07]	18.63 (6.40)	[16.53, 20.74]
Total Citations	193.73 (360.37)	[89.09, 298.37]	628.48 (630.33)	[432.05, 824.91]	1,594.97 (1,151.18)	[1,216.59, 1,973.36]
Years Since First Pub.	5.67 (3.08)	[4.77, 6.56]	13.24 (5.97)	[11.36, 15.13]	23.47 (8.13)	[20.81, 26.15]
Citations per Year	28.99 (51.75)	[13.62, 44.37]	51.69 (56.72)	[33.78, 69.59]	72.65 (57.01)	[53.91, 91.39]

Note. Standard deviations are presented in parentheses.

Conclusions/Implications/Recommendations

Every profession has a system to evaluate members, and in higher education, research productivity will continue to play an important role in assessing Agricultural Education faculty members (Birkenholz & Simonsen, 2011). The aim of this study was not to define a "good" researcher but rather to give the discipline information regarding the status of scholarly research metrics. These results provide a baseline for comparison by rank within the discipline. The results of this study should provide members of the profession with clarity concerning expectations informing them of role perceptions necessary to achieve advancement in the profession (Porter & Lawler, 1968; Vroom, 1964).

In discussions of hiring, promotion, and tenure, this study can provide a baseline for personnel decisions and evaluation for awards. Further research providing more robust insight into factors related to scholarly metrics would be beneficial. Such research should consider factors such as Carnegie classification, size of faculty, and percentage research appointments, among others.

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