The study reported here focuses on the factors that contribute to the production or non-production of refereed publications by academics. A literature review revealed that factors associated with an academics personal characteristics, attitude to work, and workplace circumstances could influence publication output. Academics from a large Australian regional university were surveyed and useable responses from 205 staff members were obtained. The results of chi-square tests showed that certain factors were not significantly related to academic output and, as a consequence, were omitted from the multivariate analysis. This analysis, using a logistic regression, demonstrated that high levels of confidence in writing for refereed publications, being male, and holding a senior academic position were predictive of producing refereed publications, and that the first factor was the most important predictor. The implications of this study for current higher educational practice and future research are discussed.
Factors differentiating between those academics who do and who do not publish refereed works

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Abstract

The study reported here focuses on the factors that contribute to the production or non-production of refereed publications by academics. A literature review revealed that factors associated with an academic’s personal characteristics, attitude to work, and workplace circumstances could influence publication output. Academics from a large Australian regional university were surveyed and useable responses from 205 staff members were obtained. The results of chi-square tests showed that certain factors were not significantly related to academic output and, as a consequence, were omitted from the multivariate analysis. This analysis, using a logistic regression, demonstrated that high levels of confidence in writing for refereed publications, being male, and holding a senior academic position were predictive of producing refereed publications, and that the first factor was the most important predictor. The implications of this study for current higher educational practice and future research are discussed.

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Introduction

According to Roth (2002, p. 215), “…the culture of academia forces those who aspire to academic life and appropriate salary adjustments to engage in publication of some aspects of their work”. Both Mruck and Mey (2002) and Sullivan (1996) argue that scholarly publishing is indispensable and continues to be the foundation and the currency of the academic’s world. Nevertheless, Hourcade and Anderson (1998) remind us that the writing process, and in fact the publishing process, is a difficult one, especially given the other competing tasks that need to be executed by an academic in his/her workplace. The same writers listed a number of additional reasons why academics either do not write or write very little. This list included writing blocks, overly high expectations, poor preparation, and the lack of a research base.

In a climate when the research performance of Australian universities is increasingly judged and funded on tangible outputs, the production of refereed publications has become vitally important. Many universities now financially reward their academic staff members for their output and individuals’ results are widely publicised within their institution. What appears to be happening is that the pressure to publish (on academics), particularly in the form of refereed conference papers, refereed journal articles, scholarly books, and scholarly book chapters, is now gaining momentum throughout Australian universities. The scoring and reporting of these publication types, by universities for the purpose of rewarding staff members and gaining governmental funding, are dictated by the stringent guidelines of the Department of Education, Science and Training (DEST) – guidelines first suggested by the Australian Vice-Chancellors Committee some seven years ago (AV-CC, 1997). No published study at this point in time has examined the reasons and motivations for writing refereed publications with a specific reference to the DEST system. Because individual academics and their employers have an interest in maximising publication output it is timely to consider those factors that lead to the production of, or inhibit, such output.

The body of literature reviewed pertaining to academic productivity suggests that academics either publish or do not publish for a variety of reasons and that these reasons can be loosely categorised into three main areas of influence, namely, attributes, attitudes, and work circumstances. Attributes were viewed as individual characteristics such as gender and background, attitudes were defined as a way of thinking, feeling, and behaving toward something or someone e.g., lacking motivation, and work circumstances considered those features of an academic’s workplace that were conducive to research and scholarship. Examples falling in this area of influence would include strong academic leadership and teaching load. The relative impact of these three influences will be considered below.

Attributes

Very little has been written, since the mid-1990s, about the influence that personal characteristics have on scholarly output. One factor that has been given prominence is gender. Schneider (1998) notes, for instance, that the most productive people in academe are male but highlights that finding the reasons for such a phenomenon is “…like searching for a smoking gun on a firing range” (p. A14). However, she did note that one reason commonly cited is that child-bearing and child-rearing responsibilities lead to a lack of stability in employment and a subsequent loss of
research focus and interest. Skolnik (2000) contends that women academics, compared to their male counterparts, give greater attention to more nurturing activities in the work environment such as teaching and counselling and place less value on publication and grantsmanship. Tien (2000), researching within a Taiwanese context, found that faculty members who publish journal articles tend to be male, young, and hold a doctoral qualification.

The topic of grantsmanship or research funding was the chief focus of one of the only recent Australian studies pertinent to the broad area of research productivity. This study was carried out by Bazeley (2003) and identified a series of issues related, not only to early career research success, but to scholarly publishing in all its manifestations. It can be argued from her findings, which drew on an analysis of both survey and interview data, that the experience of completing a doctoral study develops writing skill and confidence. Nevertheless, her results suggest that a certain confidence about publishing evolves over time and a set of relevant experiences (e.g., gaining of funding and tenure) is needed to create further writing opportunities.

Attitudes
There is a paucity of recent literature, based on empirical findings, that concentrates on the relationship between particular attitudinal measures and the production of scholarly output. Although motivation for promotion is not a commonly used concept in the literature, Tien (2000) found that this factor differentiated between those who are productive and those who are not. This finding would also be supported by work rooted in the dictum ‘publish or perish’. Such a phrase was and probably still is frequently raised in academic circles (see e.g., Everett & Entrekin, 1987). Some writers such as Hourcade and Anderson (1998) have suggested that lacking confidence in one’s writing ability is related to output; however, their view is not strongly grounded in empirical research.

Work circumstances
Despite researchers using different methodologies, and drawing from varied populations and contexts, the research evidence indicates that work circumstances can affect academic productivity. In particular, high teaching loads, non-research duties such as administration and counselling, reduction of resources through budget cuts, and general inexperience within the academy can restrict research output (Bazeley, 2003; Creamer, 1998; King, Hill, & Hemmings, 2000). Grbich (1998), researching within a health studies context in an Australian university, found evidence that a supportive and stable environment offering opportunities for collaborative research was contributive to research productivity. She also highlighted the importance of the interaction between personal and environmental factors when examining research output.

A good deal of the available literature makes mention of a concept referred to as research culture. Some writers such as Creamer focused on how a research culture can be promoted across an institution. Her writings treated issues dealing with work assignment and resource allocation. Pratt, Margaritas, and Coy (1999), on the other hand, described the attempts made by a New Zealand university department to introduce a research culture and to increase publication output. The head of this department successfully developed a research culture by establishing a reward scheme, increasing funding for conference participation, and changing some of the
department’s systems and structures e.g., creating research assistant positions and linking promotion and appointment criteria to research and other scholarly endeavours.

Overall, this review has identified, from a relatively small body of literature, that an academic’s personal characteristics, attitude to work and its associated responsibilities, and workplace circumstances can contribute to his/her production or non-production of refereed publications. Specifically, factors of gender, academic experience, level of qualification, writing skill and confidence, degree of ambition, publishing pressure, workload and work assignment, and a research culture ethos appear to be related to publishing output. The intent of this paper is to examine such a relationship and contribute information about the predictive power of these factors in terms of differentiating between those who do and who do not publish refereed works.

Method

All academic staff members (N=534) from a large Australian regional university, with a large distance education student population, were mailed a questionnaire during early July 2003 and asked through an accompanying letter to complete the questionnaire about their views, experiences, and practices in relation to the production or non-production of refereed publications. Although these academics could not be contacted individually about a possible non-response, as the questionnaire was designed to permit an anonymous reply, a follow-up E-mail was posted to all academics on the general electronic message board of the University requesting their cooperation. As a consequence of the original request and subsequent follow-up, 205 returns resulted; thus providing a response rate of approximately 40%. All of these returns were useable. Of the respondents, 53.2% were male and 46.8% were female. Regarding academic level, 6.3% identified as Level A (Associate Lecturer), 57.6% identified as Level B (Lecturer), 23.4% identified as Level C (Senior Lecturer), and 12.7% ether identified as Level D or E (Associate Professor or Professor respectively). Statistical testing indicated that the distribution of the sample with respect to academic level, i.e., Levels A, B, C, and D and E combined, did not differ significantly ($\chi^2=2.6, df=3, p<.4$) from the overall distribution of these levels within the total population of academics at the university being investigated. The combining of the two highest levels was employed to avoid very small frequencies. However, there was a significant difference for gender ($\chi^2=6.8, df=1, p<.01$) such that females were over-represented in the sample. This difference is not surprising given the relative size of the sample and the sensitive nature of the chi-square test to sample size. The expected breakdown with respect to gender was 62% male and 38% female. The comparisons drew on population data provided by the Division of Human Resources at the University.

The development of the questionnaire involved a number of steps. This four-step process involved item generation based on the literature review and interviews with senior university managers, focus group discussions with a range of academics, piloting, and refinements, and accords with the suggestions made by de Vaus (2002) and Schloss and Smith (1999). The questionnaire was divided into five parts and utilised a variety of question formats, including dichotomous responses, Likert scales, numerical rankings, and open-ended questions – copies are available upon request. It
needs to be stressed that this questionnaire was just one research tool used as part of a much larger study concerned with academic publishing.

Part 1 of the questionnaire ‘About you’ sought information such as gender, academic level, faculty, and campus location. Part 2 labelled ‘About your work’ focused on matters such as teaching allocation, time allocation to research, teaching, administration and academic leadership, and community and professional development. Part 3 titled ‘About your publishing experiences’ asked questions on matters such as publication productivity, research centre membership/affiliation, and DEST points accrual. Part 4 entitled ‘My attitude towards refereed publications’ sought responses to questions centred on the academic’s views about publishing and more specifically the DEST points system. The final part of the questionnaire, Part 5, was labelled ‘Facilitators and barriers’ and asked questions about the kind of support and barriers that are encountered in an endeavour to produce refereed publications. This paper draws on some of these data, those quantitative data relating primarily to output, personal characteristics, attitudes to publishing, and workplace circumstances.

Table 1 below contains the labels and descriptions of the main independent variables examined in, and forming the basis of, this paper. The dependent variable, V3DEST, was created as a measure of recent publication productivity and was measured by asking respondents ‘Were you eligible for DEST points over the two-year period 2001-2002 [0=No and 1=Yes]? This question asked about eligibility because it was known that some academics at the university being studied did not register their DEST points. Hereafter, in the paper, the term ‘accruing’ will be used for eligibility of points irrespective of whether points were registered or not.
Table 1
Description of Independent Variables

<table>
<thead>
<tr>
<th>Variable Type</th>
<th>Variable Label</th>
<th>Description and Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTRIBUTE</td>
<td>V1A</td>
<td>Gender: Dummy coded; 0=Female &amp; 1=Male</td>
</tr>
<tr>
<td></td>
<td>ACQUAL</td>
<td>Highest qualification: Dummy coded; 0=Other &amp; 1=Doctoral</td>
</tr>
<tr>
<td></td>
<td>YRSACAD</td>
<td>Years spent as an academic: Scaled with values 1-6</td>
</tr>
<tr>
<td></td>
<td>ACLEV1</td>
<td>Academic level: Dummy coded; 0=Levels A+B &amp; 1=Levels C+D+E</td>
</tr>
<tr>
<td>ATTITUDE</td>
<td>V2I</td>
<td>Keenness to progress/ambition: Scaled with values 1=Not interested in progression to 5=Very keen</td>
</tr>
<tr>
<td></td>
<td>V3A</td>
<td>Confidence in writing refereed works: Scaled with values 1=Very unconfident to 5=Very confident</td>
</tr>
<tr>
<td></td>
<td>V4A</td>
<td>Perceived pressure to publish: Scaled with values 1=No pressure to 3=To a large extent</td>
</tr>
<tr>
<td>WORK CIRCUMSTANCE</td>
<td>V2C</td>
<td>Proportion of external teaching in overall teaching load: Scaled from an ordinal scale with proportions ranging from 0 to 1</td>
</tr>
<tr>
<td></td>
<td>V3HNO</td>
<td>Member of designated research centre/group; Dummy coded; 0=No &amp; 1=Yes</td>
</tr>
<tr>
<td></td>
<td>V5B</td>
<td>Research culture of faculty: Scaled with values 0=Not valued at all to 5=Highly valued</td>
</tr>
</tbody>
</table>

Results

To begin exploring the relationships between ten potential independent variables and the dependent variable (viz., accrual of DEST points), crosstabulations were undertaken. Drawing on the chi-square results from these crosstabulations, it was decided that only the independent variables significantly related, at the .05 level, to the dependent variable would be included in further analyses. As a consequence, only six independent variables were used in these analyses. The four variables omitted were Keenness to progress/ambition (V2I), Perceived pressure to publish (V4A), Member of designated research centre/group (V3HNO), and Research culture of faculty (V5B). These variables did not have a significant relationship with research publication output. It needs to be noted that this screening process was conducted, in the first instance, as the sample size placed constraints on the number of independent variables which could be employed in a proposed multivariate analysis using a stepwise-like procedure (see e.g., Hair, Anderson, Tatham, & Black, 1998).

In order to distinguish between those academics who had accrued DEST points during the period 2001-2002, and those not accruing points, a logistic regression analysis was conducted using SPSS (Version 11.0) software. A logistic regression analysis is deemed an appropriate multivariate procedure for analysing a skewed and discrete dependent variable (Hair et al., 1998; Hanushek & Jackson, 1977). This feature is pertinent to the present study as the dichotomous criterion variable (V3DEST) split
58% and 42%. That is, the majority of the participants had accrued points during the defined two-year period. A forward conditional procedure was used as a means of assessing the relationship of the independent variables to V3DEST. This exploratory approach was adopted because of the absence of an established theoretical model which clearly indicated the theoretical importance and hence the order of entry of these measures. The results of the logistic regression analysis showed that three variables (viz., V3A, V1A, and ACLEV1) were significantly related at the five per cent level to V3DEST (see Table 2). In other words, high levels of confidence in writing for refereed publications, being male, and holding a senior academic position were predictive of gaining DEST points. The analysis also demonstrated that these variables accounted for a substantial amount of the variance of the dependent variable giving R² values between .33 [Cox & Snell] and .45 [Nagelkerke]. Additionally, the percentage of cases correctly classified is reported in Table 3. This form of classification represents another measure of the overall fit of the model. The percentage of ‘grouped’ cases that were correctly classified was 78%. Taken together, the R² values and classification measures indicate a good fit of the model.

Table 2
Results of the Logistic Regression Analysis with V3DEST as the Dependent Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>P</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V3A</td>
<td>1.28</td>
<td>0.26</td>
<td>35.56</td>
<td>1</td>
<td>.00</td>
<td>3.62</td>
</tr>
<tr>
<td>V1A</td>
<td>0.96</td>
<td>0.36</td>
<td>7.23</td>
<td>1</td>
<td>.01</td>
<td>2.59</td>
</tr>
<tr>
<td>ACLEV1</td>
<td>0.99</td>
<td>0.39</td>
<td>6.53</td>
<td>1</td>
<td>.01</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Table 3
Classification Results for Those Accruing and Not Accruing DEST Points

<table>
<thead>
<tr>
<th>Predicted Variable</th>
<th>Observed Variable</th>
<th>N</th>
<th>V3DEST [1]</th>
<th>V3DEST [0]</th>
</tr>
</thead>
<tbody>
<tr>
<td>V3DEST</td>
<td>1</td>
<td>119</td>
<td>95 (79.8%)</td>
<td>24 (20.2%)</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>86</td>
<td>21 (24.4%)</td>
<td>65 (75.6%)</td>
</tr>
</tbody>
</table>

It needs noting that of the independent variables not in the equation, V2C is the most significant with a p=.07. Using a different criterion measure, namely, the actual reported number of DEST points accrued within the specified period (VENO1), it can be shown that the proportion of external teaching in overall teaching load, as categorised by V2C, was significantly related to publishing output. Table 4 below shows the mean values in V2C and the result of an ANOVA, indicating academic staff members teaching exclusively, or mainly, in the external mode had higher publication output.
Table 4
Mean Number of DEST Points in Relation to Proportion of External Teaching

<table>
<thead>
<tr>
<th>Proportion of External Teaching (V2C)</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>31</td>
<td>0.59</td>
</tr>
<tr>
<td>0.25</td>
<td>42</td>
<td>1.59</td>
</tr>
<tr>
<td>0.50</td>
<td>74</td>
<td>1.32</td>
</tr>
<tr>
<td>0.75</td>
<td>40</td>
<td>2.10</td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>2.25</td>
</tr>
</tbody>
</table>

F (4, 205) = 3.60, p<.01

The other two variables which were not significant contributors in the final model were Highest qualification (ACQUAL) and Years spent as an academic (YRSACAD). ACQUAL was significantly correlated with V3A (Spearman’s rho = .47), while YRSACAD was significantly related to ACLEV1 (Spearman’s rho = .49). These intercorrelations between independent variables would appear to account for the failure of these two variables to enter the model. Moreover, it is interesting that the confidence measure (V3A) was more closely related to the possession of a doctoral qualification (ACQUAL), whereas the measure of academic level (ACLEV1) was associated with years of experience (YRSACAD).

Discussion

The results of this study not only extend previous research findings but also provide valuable insight into some of the factors associated with publication output. Three points are worthy of attention here. First, four variables identified initially in the literature as being related to academic productivity (viz., Keenness to progress/ambition, Perceived pressure to publish, Member of a designated research centre/group, and Research culture of faculty), were not included in the multivariate analysis because the results of chi-square tests showed that these variables were not significantly related to the nominated dependent variable. This is an important result given researchers such as Pratt et al. (1999) and Tien (2000) have reported that similar factors to these four were related to academic output. However, it should be noted that the procedures for making these four measures in the current study were not identical with those used in earlier studies. Second, the results of a logistic regression analysis demonstrated that three variables – Confidence in writing refereed works, Gender, and Academic level – were predictive of accruing DEST points. Moreover, Proportion of external teaching in overall teaching load, Highest qualification, and Years spent as an academic, although significantly related to the dependent variable, were not significant predictors in the model. Third, the finding that Confidence in writing refereed works is the main predictor (and in fact supersedes the possession of doctoral qualifications), in the above-mentioned analysis, is of particular interest in that it had not been used in any previous study. Writers such as Hourcade and Anderson (1998) and Bazeley (2003), however, have suggested that writing confidence is a notion requiring closer examination and this is now borne out in this investigation.

The results of the classification procedure based on three key variables (refer to Table 3) showed that predicting membership in the group of academics that did publish was
a relatively accurate process (79.8%). However, predicting membership in the group of those academics not earning DEST points was a slightly more difficult task (75.6%). It could be surmised that some of the academics forming this group were, in fact, different from their grouped colleagues in that they had published in non-refereed publications not meeting the guidelines as promulgated by the DEST. Moreover, some of these academics might have written work for peer review, but, were waiting a response, had work accepted, or had experienced the rejection of a manuscript during the time-frame of the study. A future study may need to consider dividing those respondents who have not earned DEST points into sub-categories, namely, active and non-active/writing/publishing.

The findings of the study accent the need either to maintain or to heighten attention on university-based initiatives that promote refereed publication outcomes. Such initiatives should focus as much as possible on personal attributes, attitudes to work, and workplace circumstances. Specifically, they should target the building of writing confidence, using the expertise of experienced academics in mentor programs, supporting female academics, offering incentives to pursue and complete doctoral studies, and manipulating teaching and workload allocations.

The issue of teaching and workload allocation is a critical one and needs to be examined further given that the measure V2C was not concerned with total teaching load but the distribution of the load, that is, whether or not the load is predominantly external or internal. Because many Australian universities do not have substantial proportions of external studies the results of this study in relation to teaching load may not be generalisable. However, the university involved in this study is not unique in how it delivers its courses. Measures based on distribution of teaching load are somewhat limited in that they only represent one element or dimension of overall workload but to derive a question or item purporting to measure all the dimensions of an academic’s work is also problematic.

Although this study has filled a void in the literature pertaining to academic publication productivity, the field is still open for further inquiry. For example, research is warranted to confirm that the identified factors do differentiate, in other tertiary settings, between those who publish in refereed sources and those who do not. Moreover, these investigations need to adopt a more theoretical stance and attempt to model the relationships among these identified factors in a more meaningful fashion. Future research also needs to interrogate further the nature of the attitudinal measure referred to as Confidence in writing refereed works given its prominence in this study. One possible study could be framed to examine what produces such confidence and whether or not this confidence can be developed easily through intervention.

References

Australian Vice-Chancellors Committee (1997). Streamline research data collection, recommends AVCC. AV-CC Media Releases, 18 February.


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