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Citation for author's accepted version

Roberts, Kathryn L and Turnbull, Bev J. (post-print). A millennial benchmark of nurse-academics' scholarly productivity. Retrieved from <http://espace.cdu.edu.au/view/cdu:1812>

Citation for publisher's version

Roberts, Kathryn L and Turnbull, Bev J. (2005). A millennial benchmark of nurse-academics' scholarly productivity. *Contemporary Nurse*, 19(1-2):52-62.

Notice: *The publisher's version of this work can be found at:*

<http://dx.doi.org/10.5172/conu.19.1-2.52>

CNJM 00116

**A MILLENNIAL BENCHMARK OF NURSE-ACADEMICS' SCHOLARLY
PRODUCTIVITY**

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A MILLENNIAL BENCHMARK OF NURSE-ACADEMICS' SCHOLARLY PRODUCTIVITY

ABSTRACT

The benchmark against which nurse- academics are primarily judged remains scholarly productivity,. This study sought to examine levels of scholarly productivity amongst Australian nurse academics: where they are putting their emphasis, and what progress they are making. This quantitative study used a questionnaire survey technique that identified individual items of scholarship over a two-year period. The use of two author-developed rating scales, the General Scholarship Index (GSI) and the DEST Scholarship Index (DSI) enabled a comparison of nurse academics with other academic disciplines. Findings from the study underscore the positive association between academic rank, qualifications and scholarly productivity. To facilitate increasing the latter to a level comparable with other disciplines, nurse academics may need to refocus their energies on DEST approved activities. A work climate more conducive to fostering the ethos and skills of academic scholarly productivity is needed.

Key words: scholarly productivity, academic rank, scholarship indices, publication

A MILLENNIAL BENCHMARK OF NURSE-ACADEMICS' SCHOLARLY PRODUCTIVITY

INTRODUCTION

Scholarly productivity remains the benchmark by which academics are judged for the purposes of promotion and achievement. The scholarly products of a discipline are broader than, but include written scholarship, such as journal articles and books, and oral scholarship, such as conference, seminar and workshop presentations. Published written scholarship is considered more prestigious, because, as Wilkes and colleagues (2002) point out, unpublished scholarship is inaccessible by the discipline and therefore cannot be widely assessed and critically appraised. In this study, the investigation of scholarly productivity was limited to the written and oral scholarship items listed above. It did not include other aspects of scholarship such as teaching, clinical scholarship or research grant applications.

In the University system, the funding for research is provided by the Australian Commonwealth Government Department of Education, Science and Training (DEST). The DEST formula for calculating the research quantum includes publications in refereed journals and success in applying for and receiving competitive external research grants. The outputs, i.e. publications, are much more heavily weighted than the inputs, or grant moneys acquired. Each university's success in meeting these criteria, especially the publications, determines how much research funding it receives from DEST. In this study, two indices of scholarly productivity, the General Scholarship Index (GSI) and the DEST Scholarship Index (DSI) were used. The GSI comprised all oral and written scholarship, whereas the DSI only comprised refereed articles only.

This paper reports on a part of a larger study that investigated scholarly productivity and the influences on it, including mentorship. The part of the study on which this paper reports concerns the level of scholarly productivity and its relationship to demographic variables, self-expectations

and perceptions of university expectations. The remainder of the study is reported in two other publications, one on constraints and facilitators of productivity generally (Roberts & Turnbull, in press) and one on the influence of mentorship in particular (Turnbull & Roberts, in press).

While there is published data reporting Australian nurse-academics' scholarly productivity in the mid-1990s (Roberts, 1997), a considerable amount of change can occur in the tertiary sector in five years, particularly in a discipline that is still settling into academe. The authors therefore deemed the millennium an appropriate time to investigate progress. The aims of this study therefore were to:

- establish a millennial benchmark of nurse-academics' scholarly productivity
- compare DEST-approved scholarship with other forms of scholarship
- investigate the influence of self expectations and perceptions of university expectations on scholarly productivity
- investigate the influence of demographic variables on scholarly productivity, and to
- compare present findings with those of the mid-1990s.

Review of the Literature

Studies on scholarly productivity report measurement of the productivity of a group of individuals, for example the whole population, a sample of that population, or a particular subgroup such as nurse-researchers. Earlier studies published in the latter half of the 1980s in the United States had shown that in the United States, the average annual scholarly productivity of nurse-academics was quite low. In a study of the journal publications of 442 nurse-researchers in seven public research universities, the output was approximately half of a peer-reviewed journal article (Ostmoe, 1986). Megel, Langston and Creswell (1988) measured the scholarly productivity of 148 nurse-researchers with doctorates over three years and found that their yearly average productivity was slightly under one refereed and one non-refereed article. In Canada, Acorn's (1990) study of 113 full-time nurse-academics from one fifth of Canadian university faculties reported an average

of 1.3 publications per year, again not restricted to peer reviewed articles. These studies represent the two main research approaches, the audit approach of analysing journal publication output and the survey approach of questionnairing the researchers. The survey approach is likely to yield higher scores than the audit approach because the latter misses publications in unsurveyed journals. In addition, the survey approach may include non-refereed publications and be subject to response bias, i.e., those with more publications are more likely to respond to the questionnaire.

In Australia, Roberts (1997) surveyed the whole population of nurse-academics and obtained a response rate of 65%. She found that on average, nurse-academics published the equivalent of 0.9 refereed articles per year, using a Scholarship Index that weighted different types of scholarship according to the importance given them by the University sector, but including all forms of written scholarship, as well as oral scholarship. Roberts and Turnbull (2002) analysed the scholarly output of a random, stratified sample of publications of 302 nurse-academics by means of an audit of two years of CINAHL, using a scholarship index that weighted different types of publications according to the way that they were indexed by DEST, but included all types of journal articles. They found that the mean scholarly productivity was 0.28 of a refereed article per year. This study had the advantage of precluding response bias, but did not include other forms of scholarship than journal articles.

In terms of oral and written types of publications, American nursing faculty tended to give priority to journal articles (Megel et al., 1988) while Canadians gave priority to conference papers (Acorn, 1990). Australians also gave priority to conference papers, seminar presentations and unpublished conference presentations (Roberts, 1997). This could represent different stages of academic development, as the United States entered the tertiary education sector in force well before the Canadian and Australian systems. It could also reflect the focus of the samples used.

Several studies of nurse-academics have examined the perceived pressure to publish. Melland (1995), in a survey of 100 baccalaureate nursing faculty in six states in the USA, found that the majority perceived great pressure to publish, and this was stronger in those with an earned doctorate

and those working in research universities. In 1997, Roberts reported that only a minority of the sample (17%) felt that they had published as much as their institution expected, but that over a third (39%) felt that they had published a reasonable amount by their own expectations (Roberts, 1997). Half believed that they had met neither their own nor the university's expectations. In a qualitative, grounded theory study of 20 nurse-academics in four Australian states, Worrall-Carter and Snell (2003/4) found that their informants felt under considerable pressure to do research and publish.

In studies on the influence of demographic factors on scholarly productivity, academics with doctorates have been shown to publish significantly more than those with lesser degrees (Ostmoe, 1986; Acorn, 1990; Roberts, 1996; Roberts, 1997). Academic rank has also been shown to affect scholarly productivity (Roberts, 1996; Roberts, 1997; Roberts & Turnbull, 2002)}. In the latter study, Roberts and Turnbull (2002) found that nurse-academics with a doctorate had triple the scholarly output of those without, and that scholarly output was also related to academic rank, with professors publishing twice as much as associate professors and senior lecturers, and five times as much as lecturers.

METHODOLOGY

This study was descriptive and correlational in design, employing a questionnaire survey technique. The sampling frame was a recently updated database of the population of nurse-academics (Roberts & Turnbull, 2002). The random sample comprised 291 nurse-academics and was stratified by academic rank. The authors were not included. Otherwise, all professors (Level E) and associate professors (Level D), half of the senior lecturers (Level C) and one-fifth of the lecturers (level A and B) were included. The sample was stratified this way in order to maximise the data collected as it was known from previous studies (Roberts, 1997; Roberts & Turnbull, 2002-2003) that publication is in proportion to academic rank. The effects of stratification were removed for the data analysis by performing computations that unweighted the sample.

Instrument

The instrument was an adaptation of the questionnaire used in a previous study (Roberts, 1997). The original questionnaire captured data on written scholarship and demographic variables such as age, initial nursing education, state of employment, academic rank and highest academic qualification. It asked about achievement of self and university expectations concerning publishing. The original rating scale in Roberts (1997), the Scholarship Index, comprised written items of scholarship that were both DEST-approved, e.g. refereed articles and non-approved, e.g. non-refereed articles, as well as conference and seminar presentations.

Important additions were made to this version of the questionnaire by the inclusion of conference, seminar and poster and workshop presentations. In addition, it also asked for authorship position on the item, i.e. sole, first, second, or later author/presenter to allow differential weighting for participation. To improve the representativeness of the data in this study, respondents were asked to enumerate their scholarly productivity over a period of two calendar years, from Jan 2000, to Dec 2001. In addition to asking about their own and university expectations regarding scholarly productivity, they were also asked about the importance of publishing to them personally and to the university.

Data Collection

The questionnaires were sent out by post to the various institutions for distribution. Included in each packet was a letter, a questionnaire, and a post-paid return envelope. To avoid unnecessary follow-up, the packet also contained a postcard to be mailed under separate cover advising the researchers that the respondent had completed and returned the questionnaire. Follow-up questionnaires were sent to all those who had not returned the postcard.

Data Analysis

In order to ascertain the focus of the scholarship produced, the data were analysed using two ratings: the General Scholarship Index (GSI) including all written and oral forms of scholarship, and the DEST Scholarship Index (DSI) for refereed articles only, which comprised most of the written scholarship. The GSI thus incorporates the DSI. The GSI was used to compare subgroups of nurse-academics and to compare the results of this study with earlier findings. The DSI was used to compare DEST approved and non-approved scholarship.

Statistical analysis was used to determine relationships between variables,. Demographic variables and types of publications were described by means of frequency distributions. Because the data were strongly skewed, non-parametric tests such as the Mann-Whitney U-test and the Kruskal-Wallis test were used to determine initial statistical significance of individual variables. To compare publishing expectations of respondents and their perceptions of their university's expectations contingency tables were employed. A similar procedure was used to compare participants' perceptions of their own and the university's views on the importance of publishing.

To determine the relative effects of the socio-demographic variables upon the dependent variables the GSI and DSI, a logistic regression was run with the variables that were individually influential. For these tests, the GSI and DSI were reclassified into high and low publishing groups, with those above the mean being classified as high and those below the mean as low.

Ethical Aspects

The study was approved by the Human Ethics Committee of the authors' university. A letter of explanation was sent to the participants inside the questionnaire packet. Filling in the questionnaire was taken to be informed consent as it was sent directly to the participant so that there could be no influence on the process. Data security processes were maintained during the course of the study.

RESULTS

Return Rate and Sample

The return rate for the questionnaires was 54% (n=156). Of the respondents, 82% were female. Almost half (48%) of the respondents were aged between 41-50 years and over a third (38%) were aged between 51 and 60 years. Few were in their twenties (2%) or thirties (7%) or over 60 (5%).

The sample comprised professors (22%), associate professors (16%), senior lecturers (34%), lecturers (24%) and associate lecturers (4%). Since there were so few of the latter, they were combined with lecturers for the purposes of analysis. Over half (58%) had a doctoral degree while a third (36%) had a masters degree and few (6%) had less than that as their highest qualification. However, this sample was weighted according to academic rank and since academic rank and qualifications are strongly linked (Roberts & Turnbull, 2002), this naturally represents an over-representation of higher qualifications.

Scholarship Indexes: The GSI and DSI

After unweighting, the mean GSI was 1.97, which equates to approximately two refereed journal articles per year. After unweighting, the mean DSI was 0.8, which is less than half of the GSI and equates to first authorship on a refereed paper (0.75). This indicates that the majority of the scholarship of this group is allocated to activities other than refereed articles. The logistic regression on the GSI showed that academic rank would predict the score. However, none of the factors would predict the score on the DSI.

The GSI and DSI were strongly correlated ($r = 0.7$), as might be expected since the one contains the other. However, in a post- hoc analysis the data were broken down into oral and written scholarship, and a post-hoc Pearson correlation was done on the two types of scholarship. They were only moderately correlated ($r = 0.28$). This suggests that different participants focus on oral and written scholarship.

Importance of Scholarly Productivity: Self and University

Figure 1 shows the perceived importance of scholarly productivity to both nurse-academics and the University.

INSERT FIGURE 1 HERE

Figure 1 shows that although most respondents believed that publishing was very important or important to both the university and themselves, the strength of the importance was perceived as greater for the University.

Age was very significant in terms of perceived importance of publishing to nurse-academics ($p = 0.008$). The perception of importance peaked in the 40s, with two thirds (68%) viewing publishing as very important. There was a decline after that, with 59% in their 50s and 43% in their 60s reporting that they perceived publishing as very important.

Academic rank was also strongly positively associated with perceived importance of publishing ($p = 0.002$). Most professors (88%) and associate professors (77%) and the majority of senior lecturers (58%) stated that publishing was very important to them personally, while only a third of lecturers perceived it as very important. As might be expected, because academic rank and qualifications are strongly linked, there was a similar positive relationship between highest academic qualification and perceived importance of publishing ($p < 0.0001$). Most of those with a doctorate (80%) viewed it as very important, while only a third (35%) of those with a master's degree did.

Since there was so little variance in the variable perceived importance of publishing to the University, none of the demographic variables, including academic rank, had any influence on it.

Expectations of Publishing: Self and University

Generally, expectations of scholarly productivity were not perceived as being met (Figure 2).

INSERT FIGURE 2 HERE

Figure 2 also shows that a significantly higher proportion believed that they had met their own expectations than those of the University ($p = 0.0001$).

There was a significant positive relationship ($p = 0.007$) between academic rank and percentage satisfied with the amount they had published: the majority of professors (59%) and associate professors (55%) were satisfied with their scholarly productivity, but only a minority of senior lecturers (38%) and lecturers (28%) were satisfied. As might be expected, there was a similar positive relationship with highest academic qualification ($p = 0.0001$).

There was a strong correlation between academic rank and belief that they had published enough by the university's expectation ($p = 0.0001$); however, professors were the only group in which the majority (59%) believed they had met the university's expectations concerning publication. There was a similar strong correlation ($p = < 0.001$) between highest qualification and belief in meeting the university expectation; almost all (90%) of those who believed they had met the university's expectations concerning scholarly productivity had a doctorate

Effect of Demographic Variables on Scholarly Productivity

There was a strongly positive relationship between academic rank and both the General Scholarship Index ($p = < 0.0001$) and DSI ($p = < 0.0001$). For each level of academic rank above lecturer, who scored 0.6, the GSI rose by approximately 1, the equivalent of one journal article. Figure 3 shows this relationship.

INSERT FIGURE 3 HERE

There was a positive relationship between type of publication and academic rank: the higher the level, the higher the percentage that published in the DEST approved categories. Lecturers on average produced the equivalent of one-third of a refereed article per year, which doubled for senior lecturers (0.7) and again for associate professors (1.2) and then rose slightly for professors (1.4). However, only 82% of the latter had published a refereed article during that period as evidenced by a score of >0 on the DSI.

There was also a statistically significant positive but not predictive relationship between highest academic qualification and General Scholarship Index ($p = <0.0001$) and DEST Scholarship Index ($p = < 0.0001$). Figure 4 shows this relationship.

INSERT FIGURE 4 HERE

Figure 4 shows that nurse-academics with a doctorate have a GSI approximately treble that of those with a masters degree, whose GSI is twice that of those with a bachelor's degree. It also shows that doctorally prepared academics achieved approximately quadruple the DSI of those with a masters and twelve times that of those with a bachelor degree. However, only three quarters (73%) of those with a doctoral degree had published in the time period under investigation, as evidenced by the presence of a DSI score of >0 .

Those respondents aged in their forties and fifties scored significantly higher on the General Scholarship Index than those in their thirties or sixties ($p= 0.03$). Age did not affect the DSI: the scores for those aged between thirty to fifty were very similar, but for those in their twenties and sixties, scores were much lower.

The mid-1990s and the millennium

In Roberts (1997), the data were collected five years before the data in this study. In that study, the mean Scholarship Index (SI) was 0.9. However, the SI included only written scholarship. A post-hoc analysis of the present data to include only written scholarship gave an index of 1.1. This suggests that the rate of nurse-academics' scholarly productivity is rising marginally, especially considering that the GSI discounted for multiple authorship. More importantly, the proportion of the scholarship that encompasses refereed articles is rising. In the mid-1990s, refereed articles counted for 15% of the scholarship; at the millennium, they accounted for approximately a third.

DISCUSSION

The return rate for this study was good for a postal questionnaire and thus the results have a considerable amount of external validity. Moreover, the fact that the findings of this study support the findings of a previous study with a high return rate (Roberts, 1997) indicates that they are well grounded.

The issue of rewards for scholarship is complex. Any publication in a refereed journal, whether research, theoretical or clinical scholarship, counts towards promotion, but refereed publications count more than non-refereed publications and oral scholarship. However, only publications that are reports of research, whether articles or books, count towards the DEST research quantum and result in monetary returns to the university. The latter also are more useful in gaining points on an application for research funding. It could be argued that clinical, theoretical and teaching scholarship should be given equal recognition. However, DEST has determined that it will only give financial rewards for research. Therefore, if nurse-academics wish to contribute towards the research quantum, it is incumbent upon them to direct their efforts towards publishing research papers in refereed journals.

The GSI indicated that the nurse-academics produce the equivalent of just under two refereed journal articles per year. However, elimination of items not recognised by DEST, i.e. the DSI, reduced that to just over three-quarters of a journal article. This, however, is probably an overestimate as the DSI score in this study included non-research scholarship. A post-hoc analysis showed that approximately 1/3 (30%) of nurse-academics who publish are not publishing in the areas recognised by DEST. The output of this group is less valued by the mainstream part of the system. It would be useful to carry out another study that differentiated more clearly between these two types of scholarship.

This study has shown that there was a rise in scholarly productivity in the last five years; however the rise was minimal. It may be that the older, more qualified and experienced nurse-academics are not teaming up with or mentoring those coming along, perhaps because many have

not been mentored themselves and therefore do not become mentoring role models. In another arm of this study (Turnbull & Roberts, in press), the authors found that more than a quarter of participants reported never having had a mentor. Mentoring was more likely to occur where a collaborative and collegial network to support scholarly productivity existed; however it was often not available due to the burden of teaching and administrative over-load, and a cultural climate of non-support. A workplace environment that is appropriately supported by adequate resources may be as important as the research training that can occur through mentoring.

This study has demonstrated that nurse academics are still concentrating on scholarship that is less well rewarded in the tertiary system than research scholarship. Oral scholarship is still very much a significant part of the picture, even when heavily discounted in the calculations to reflect the values of the tertiary sector. Many nurse academics come from a practice and or teaching background and need time and training to adapt to a university ethos that especially rewards research-based publications. Faculties need to facilitate written scholarship by encouraging the development of skills of scholarly writing for publication.

The finding of a preference for oral presentations supports the earlier findings of Roberts (1997) and confirms that there has been little change in the last five years. This may be a reflection of the predominantly oral culture of nursing (Roberts, 1997). Also, the process for getting a paper accepted at a conference is less rigorous and time consuming than getting a paper accepted for publication in a journal. It may also be that many nurse-academics need development of skills in writing for publication or are using conferences to build up confidence. Finally, the finding that different people are producing oral and written scholarship could also be linked to personality type and matter of whether a person prefers solitary pursuits like writing or people-oriented forms of scholarship (Roberts, 1997). This could be the basis of some future investigation of a link between these factors.

The finding that most considered that publishing was very important to both nurse-academics and the university supports the findings of Worrall-Carter and Snell (2003/4) and Melland (1995)

that academics are under pressure to publish. The finding that doctorally prepared nurse-academics believe that publication is very important to them supports the finding of Melland that those who are doctorally prepared feel under more pressure. The finding that half of the respondents met their own expectations for publication represents a significant increase from the previous finding of one third reported by Roberts (1997). The proportion perceiving that they had met the university's expectations was an even greater increase, almost double. It is likely, however that this reflects the weighting of the sample towards those nurse academics who publish more and are more likely to perceive a congruence between their expectations and those of the university. The finding that more met their own expectations than the perceived university expectation suggests that they are well aware that they are not meeting their university's expectations concerning publication. Nurse-academics need to find ways of meeting the university expectations, and could be assisted by a corporate climate of support.

In part, the universities' expectations are linked to the achievement of traditional disciplines. It was difficult to compare Nursing with them as DEST no longer publishes the figures for the purposes of comparison. However, in the mid-1990s, Engineering had a low average scholarly productivity rating of 1.1, and Social Sciences had one of the highest at 4.1. Nursing, at a maximum of 0.8, is approaching the level of Engineering five years ago.

In a climate of economic rationalism, it would seem prudent to focus on the research objectives of the university since this attracts extra funding. We should continue to encourage research and associated publications in refereed journals so that nursing contributes proportionately to the acquisition of rewards. A greater output of these will add knowledge to the discipline and lead to increased recognition of nursing as a legitimate academic discipline.

Academic rank influenced both the GSI and the DSI. This was not unexpected since it is known that scholarly productivity rises with academic rank. This finding supports the earlier findings of Roberts (1997) and Roberts and Turnbull (2002-2003)

This study has shown that the doctorally prepared nurse-academics are the ones who are typically far outperforming the masters prepared in the DEST-approved area. This probably occurs because the latter do not do not have as many research skills and/or are devoting their energies to getting their doctorate. The finding that highest qualification is related to scholarly output supports the earlier findings of Roberts, (1997) and Roberts and Turnbull (2002-2003).

The results of this study would indicate that from the mid-90s to the turn of the millennium there has been some increase in scholarly productivity and proportion of the scholarship that is refereed articles. Although these figures are somewhat crude owing to the differences in measurements, it is encouraging that the discipline is improving somewhat as it matures and settles into the tertiary sector. However, there is still a long way to go.

It would be useful for universities to implement strategies to increase scholarly productivity. However, it is important initially to raise nurse-academics' awareness of the expectations of the university concerning scholarly output and its relationship to promotion and success in research grant applications. This can provide an incentive for individuals to perform in this area.

When exploring strategies to promote a research culture, Clare and Hawes (2001) identified a lack of confidence on the part of nurse academics to contribute to the knowledge of the discipline through research. Research and scholarly writing skills take time and practice to hone. There is a need to provide expert personnel whose role is specifically to target and work with disciplines or faculties where scholarly productivity is low.

The doctorally prepared group are the ones that have the highest scholarly productivity, probably because They understand the research quantum process and calculation and are more experienced at applying for research funds and running research projects. It therefore follows that it is important to increase the numbers of doctorally prepared nurse-academics. Moreover, if we wish to improve our DEST-approved scholarly output, it would make sense to invest more of the available resources in the doctorally prepared academics. This could involve encouraging the group that have not yet achieved publication of refereed research papers and rewarding those who have.

Those in their forties appeared to view scholarly productivity as more important than those older or younger, perhaps because they were still building their careers. It would therefore make sense to target those in the middle of their academic career path as they may be more motivated to publish.

Worrall-Carter and Snell (2003/4) outlined organisational assistance strategies that assisted productivity such as redefinition of roles, re-organisation of workloads, support of relevant professional development activities, and interdisciplinary collaboration. Implementation of these strategies on a systemic basis within organisations would be helpful. A more tangible incentive would be a monetary reward for groups or individuals who produce DEST-approved publications. For example, a university receives from DEST a substantial sum per refereed article and some of this money could be passed on to the authors to provide an incentive to publish further works and support to do so. Another incentive that has been effective in other disciplines is the requirement of supervisors that their students publish papers as part of demonstrating progress during a doctoral candidature.

The strength of this study is that it has built on the previous work of Roberts (1997), and Roberts and Turnbull (2002-2003) and establishes a millennium benchmark for Australian nurse-academics' scholarly productivity. Furthermore, in using a sample stratified for academic rank, it accessed more data. By weighting the contribution to the scholarship, it brought the results closer to the DEST criteria. By using logistic regression, it was able to show the predictive influence of academic rank on the GSI.

This study has also contributed by distinguishing between DEST-approved and broader forms of scholarship, which include writing academic texts, non-refereed journal articles and oral scholarship. However, the design weakness of not distinguishing between research and non-research refereed publications inflated the DSI slightly. This made it difficult to carry out an interdisciplinary comparison of scholarly productivity. Future studies on this topic should distinguish between research based and non-research based authorship.

In conclusion, this study has demonstrated that at the millennium, scholarly productivity levels have increased slightly, with an increase in the proportion that is research scholarship, although overall they are not yet comparable with other disciplines. It has also demonstrated that nurse-academics are still focussing on oral scholarship at the expense of written work. In addition, it has confirmed the strong link between scholarly productivity, academic rank and academic qualifications. Further research that is better able to distinguish between research and non-research publications may clarify some of the issues raised by this paper. More attention needs to be given to fostering scholarly productivity by providing a suitable climate and resources in which it can flourish.

REFERENCES

- Acorn S (1990). Scholarly productivity of university nursing faculty. *Canadian Journal of Nursing Research* 22(2): 7-13.
- Clare J and Hawes C (2001). Engendering Change: Empowering nurse academics to take part in a university research culture. *Australian Journal of Advanced Nursing* 18(4): 32-36.
- Megel M, Langston N and Creswell J (1988). Scholarly productivity: a survey of nursing faculty researchers. *Journal of Professional Nursing* 4(1): 45-54.
- Melland H (1995). Nurse-educators and the demands of research. *Journal of Nursing Education* 34(2): 71-76.
- Ostmoe P (1986). Correlates of university nurse faculty publication productivity. *Journal of Nursing Education* 25(5): 207-212.
- Roberts K (1996). A snapshot of Australian nursing scholarship 1993-1994. *Collegian* 3(1): 4-10.
- Roberts K (1997). Nurse academics' scholarly productivity: framed by the system, facilitated by mentoring. *The Australian Journal of Advanced Nursing* 14(3): 5-13.

Roberts K and Turnbull B (2002). From apprentices to academics: are nurses catching up? *Collegian* 9(1): 24-30.

Roberts K and Turnbull B (2002-2003). Scholarly productivity: are nurse-academics catching up? *The Australian Journal of Advanced Nursing* 20(2): 8-14.

Roberts K and Turnbull B (in press). Nurse-academics' scholarly productivity: perceived frames and facilitators. *Contemporary Nurse*.

Turnbull B and Roberts K (in press). Nurse-academics' mentorship: rhetoric or reality? *Collegian*.

Wilkes L, Borbasi S, Hawes C, Stewart M and May D (2002). Measuring the outputs of nursing research and development in Australia: the researchers,. *Australian Journal of Advanced Nursing* 19(4): 15-20.

Worrall-Carter L and Snell R (2003/4). Nurse academics meeting the challenges of scholarship and research. *Contemporary Nurse* 16(1-2): 40-50.

FIGURES

Figure 1: Perceived Importance of Publishing

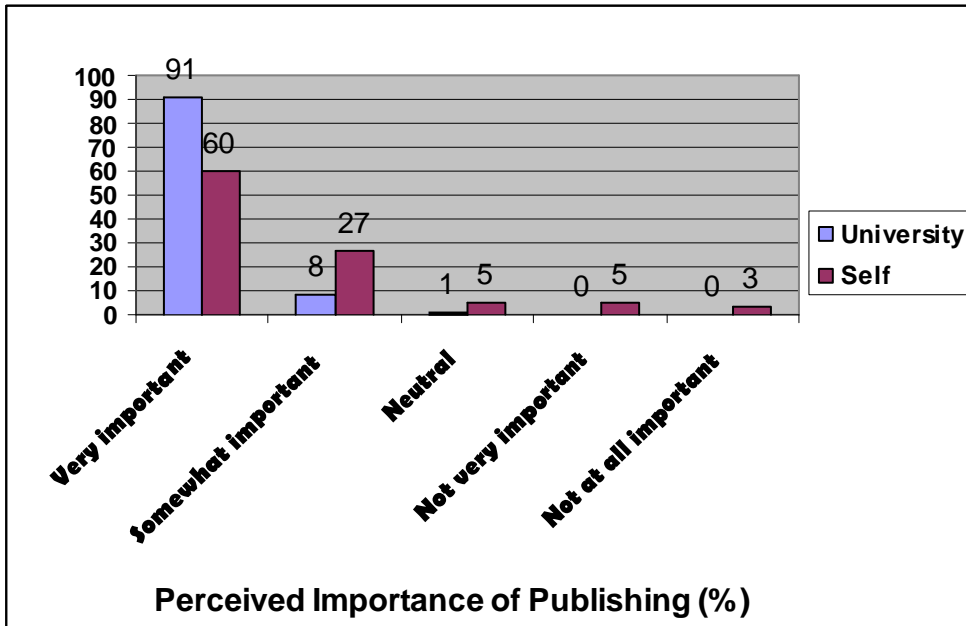


Figure 2: Meeting Expectations of Publishing

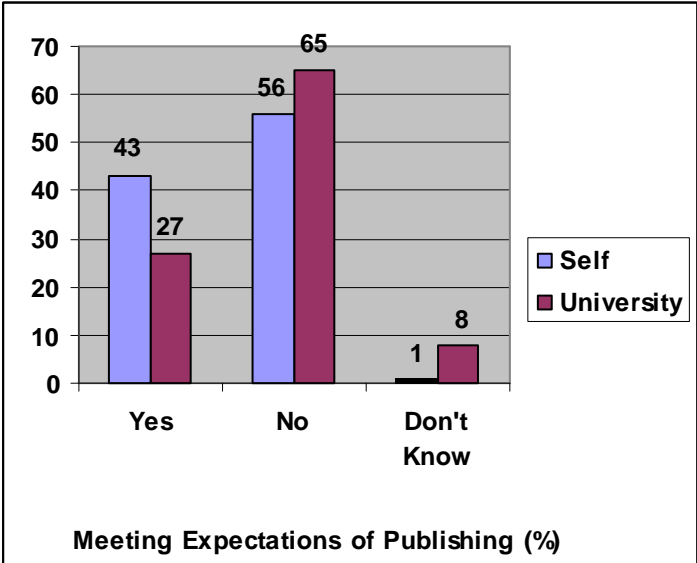


Figure 3: Academic Rank and Scholarly Productivity

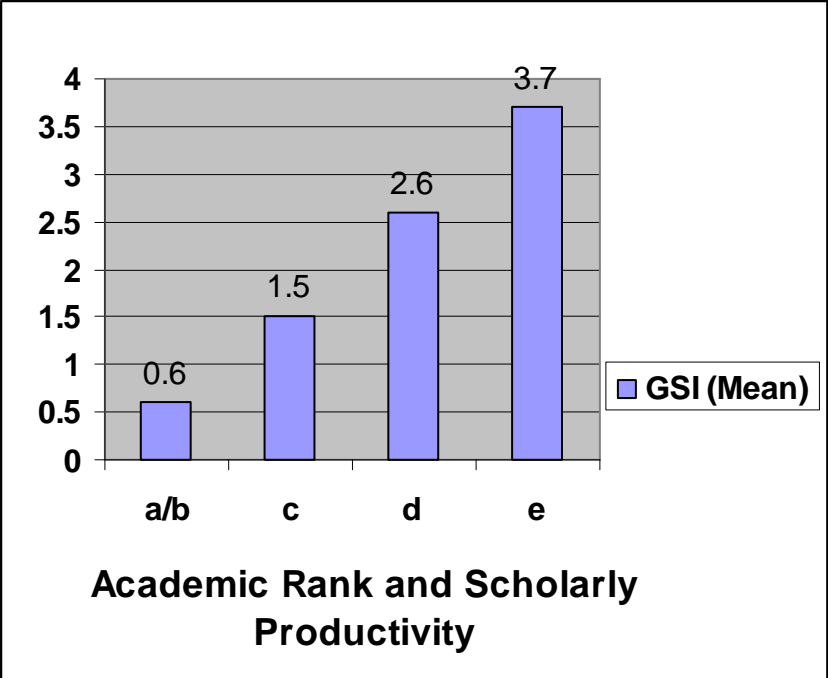


Figure 4: Academic Qualifications and Scholarly Productivity.

