

Lecturer self efficacy: Its related dimensions and the influence of gender and qualifications

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In this study, a sample of Australian academics from two institutions, was used to investigate factors which relate to lecturer self-efficacy. A questionnaire was utilised to obtain responses in three separate areas, namely, research, teaching, and service (i.e., administration/professional engagement). Subsequent factor analysis resulted in the identification of four research self-efficacy factors, two teaching self-efficacy factors, and two service self-efficacy factors. The relationships among these factors were then explored and consideration was given to the influence of gender and level of qualifications. Significant multivariate differences were found for gender, level of qualifications, and their interaction on the set of the self-efficacy factors. An examination of the univariate test results revealed a number of significant findings, including that males and those holding doctoral qualifications tended to report higher levels of research self-efficacy. These results are discussed in terms of their implications for university managers, lecturers, and other researchers.

Background

It is common practice across the higher education sector to conceptualise the work of faculty members within three broad areas, namely, research, teaching, and service. However, faculty members, according to Seyyed, Al-Haji Umar, and Al-Hajji (2004) “face perplexing choices in balancing their workload among teaching, research, and service activities”. Such a choice can be the result of: mixed signals as how best to expend energies across the three workload areas (Austin & Gamson, 1983); workload strain and a lack of time to complete the multitude of tasks academics set themselves (Bellas & Toutkoushian, 1999); and, pressure from competing groups, including students, colleagues, outside agencies, and managers (Baron, 2000). Because research tends to be valued over teaching and service in many higher education settings e.g., Australia (Bazeley, 2003; Star, 2004), England (Armstrong & Goodyear, 2005; Sykes, 2006), and New Zealand (Middleton, 2005), faculty members commonly feel the pressure to research and to disseminate the findings of their research. Despite gaining some intrinsic and extrinsic rewards by engaging in teaching and service activities, the greatest rewards (such as tenure, promotion, and professional standing) flow to those faculty members who publish scholarly work (Diamond, 1993; Watty, Bellamy, & Morley, 2008). Increasingly, studies are emerging that investigate factors that assist or hinder those who publish and those who do not in an attempt to shed further light on the ‘publish or perish’ or ‘publish or prosper’ issue and to inform managers on ways to improve the publishing performance of their employees (see, for example, Hemmings & Kay, 2007; Hemmings, Rushbrook, & Smith, 2007; Zhao, McCormick, & Hoekman, 2008).

Social cognitive theory highlights the interactions among personal factors, environmental conditions, and behaviours (Bandura, 2001). A key construct grounded in this theory is

self-efficacy. Self-efficacy refers to an individual's belief in his/her capability to organise and implement actions to reach a certain level of performance. Bandura (1997) contends that self-efficacy beliefs are influenced by a number of different sources, with previous performance (particularly mastery experiences) being the main source of influence. Researching within a higher education context, Major and Dolly (2003, p. 91) noted that self-efficacy "...encapsulates the way that faculty members see themselves as teachers, researchers, and academic citizens as well as their beliefs about whether they can successfully complete tasks in each of these areas". Other researchers, including Bailey (1999), Blackburn and Lawrence (1995), Schoen and Winocur (1988), and Vasil (1992) have also drawn on the self-efficacy construct when investigating the work of faculty members. Although their chief focus has been research self-efficacy and its relationship with research productivity, there has been some consideration given to both teaching self-efficacy and service self-efficacy. Teaching self-efficacy has been typically described in terms of preparation, delivery, and assessment; whereas, service self-efficacy has been defined in a number of ways. To exemplify, Bailey (1999) defined service self-efficacy, through factor analytic means, in terms of administration and consulting, while Blackburn, Lawrence, Bieber, and Trautvetter (1991, p. 406) viewed service more generally by drawing on three elements: "public (dealing with the nonacademic outside world), professional (working with associations, for example) and campus (committees, etc.)".

According to Schoen and Winocur (1988) and Bailey (1999), the academics they surveyed reported higher levels of self-efficacy for teaching compared with other work tasks. The explanation offered for this finding was that teaching is performed more frequently and therefore more opportunities are afforded to successfully master this activity. They also demonstrated, in their respective studies, that there were no significant differences between male and female academics in relation to self-efficacy for research. However, this finding is contrary to that of Vasil (1992) who found that male academics report stronger research self-efficacy beliefs than their female counterparts. It needs noting that Vasil's (1992) study was based on the responses of North American academics; whereas, Schoen and Winocur and Bailey used data from samples of Australian academics. These Australian researchers also investigated the effect of rank on levels of research self-efficacy beliefs and concluded that senior academics, compared to junior academics, were more self-efficacious with respect to research. Bailey (1999), unlike Schoen and Winocur (1988), examined the relationship between self-efficacy for research and self-efficacy for teaching and found a correlation coefficient of .142. From this single result, he argued that the two constructs were essentially independent. However, he did show using mean comparisons that research self-efficacy was clearly related to research productivity and the level of qualification held by the academics sampled.

In Australia, the last reported study of self-efficacy in the context of faculty work was conducted by Bailey (1999) who collected data from lecturers (n=100) working in one institution. Given the differing context and the rapid change in the higher education sector in Australia since the 1990s (see, for example, Coates, Goedegebuure, van der Lee, & Meek, 2008; Karmel, 2003), it is timely to explore how these work tasks, using a self-efficacy framework, are currently viewed and conceptualised by faculty members. Moreover, because of the challenge to recruit and retain faculty members in the

forthcoming decade (Hugo, 2005), this exploration should especially focus on matters pertaining to gender and academic training. No doubt, developing an understanding as to how faculty members assess their skills and abilities in performing work-related tasks will be of utmost interest to managers and planners employed in the sector.

In summary, this study was designed to serve three purposes: first, to identify the major dimensions of the lecturer self-efficacy construct; second, to develop subscales to measure lecturers' self-efficacy on these dimensions; and third, to test for differences with respect to gender and qualifications across these subscales.

Method

Participants

The participants in this study were drawn from lecturing staff at two Australian universities that confer degrees from bachelor to doctoral level. One institution was a large regional university and the other was based in a state capital city. The staff members were affiliated with eight Department of Education, Science and Training (DEST)-categorised research fields: (i) sciences, (ii) information and computing, (iii) engineering and technology, (iv) agricultural/veterinary/environmental sciences, (v) medical and health science, (vi) education, (vii) economics/commerce/political science/tourism, and (viii) arts/humanities/social sciences/policing. Moreover, the overall distribution of participants provided a reasonable representation in terms of gender and academic level.

Instrumentation

The development of the questionnaire was informed by a literature review, expert panel input, and piloting. This developmental process was in accord with suggestions made by methodologists such as Creswell (2002) and de Vaus (2002). The questionnaire was divided into three sections. Section 1 was designed to seek information of a background nature, including gender, academic level, and highest qualification. The second section was constructed to ask participants to indicate how confident they were in performing work-related tasks using a 10-point scale ranging from not confident at all to completely confident. The tasks were grouped according to three areas, namely, research, teaching, and service activities. This section of the questionnaire was partly based on an instrument developed by Schoen and Winocur (1988). Although some of their items were retained, many were reworded or replaced to reflect changes that had occurred in academe during the past two decades. The focus of Section 3 was on the level of importance and satisfaction that participants gave to these tasks, as well as the number of refereed publications produced during the participant's academic career. Additional information about the questionnaire can be requested from the authors of this manuscript.

Procedure

Participation in the study was voluntary and participants responded anonymously to the questionnaire mailed to all full-time lecturing staff ($n=985$). An email reminder to

complete the questionnaire was then placed on the electronic notice-boards of the two universities, resulting in 357 useable returns being received. This represented a response rate of approximately 36 percent. Alreck and Settle (1985) contend that a response rate of this magnitude is relatively high in mail surveys and should be viewed as more than acceptable. It needs to be noted that 26 cases with missing data were eliminated from some of the planned analyses.

Table 1: Factor loadings of research self-efficacy items

Factor	Research item	Factor 1	Factor 2	Factor 3	Factor 4
<i>Factor 1 items</i>	Delivering conference papers	.901	-.072	.006	.054
	Attending conferences	.857	-.142	-.084	.164
	Preparing conference papers	.842	.025	.040	.067
	Delivering research findings at staff seminars	.704	.187	.036	.084
	Writing for an academic audience	.694	-.018	.282	.053
	Presenting invited research papers in other institutions	.611	.181	.188	.069
	Submitting papers for publication	.607	.085	.341	-.001
	Writing journal articles	.580	.036	.364	.067
	Resubmitting papers for publication	.531	.176	.324	.014
	Supervising students' research projects	.509	.333	.213	-.167
	Supervising postgraduate students	.481	.284	.301	-.186
	<i>Factor 2 items</i>	Collecting data	.246	.633	-.208
Analysing research results		.291	.626	.012	-.006
Preparing a research budget		-.068	.608	.316	.147
Working with research assistants		.201	.568	.237	.006
Leading research projects		.139	.563	.283	.143
Conducting pilot studies		.179	.544	.045	.252
Applying for research grants		.037	.498	.356	.163
Collaborating with colleagues about research		.345	.466	-.077	.181
Adhering to research ethics requirements		.422	.437	-.249	.163
Designing research		.239	.432	.188	.261
<i>Factor 3 items</i>	Writing textbooks	-.032	-.095	.822	.216
	Writing research-based books	.055	.052	.747	.218
	Reviewing books	.226	.026	.692	-.066
	Reviewing journal articles	.315	.237	.520	-.115
	Applying for study leave	.127	.205	.490	.102
<i>Factor 4 items</i>	Examining theses	.364	.314	.458	-.302
	Keeping up to date with research literature	-.038	.026	.089	.803
	Reviewing literature for a research project	.239	.204	.023	.574
	Generating research ideas	.118	.228	.194	.538

Analyses and results

The three groupings of items in Section 2 of the questionnaire were examined separately using a principal components analysis with an oblique rotation (using SPSS, Version 16.0). Three extraction criteria were used, namely, an eigenvalue greater than one, scree test, and

interpretability. The analysis of the research items identified four factors and these accounted for approximately 69 percent of the variance in the variable set (refer to Table 1). Thirty of the 32 items were used to delineate the components.

An analysis of the 22 teaching items revealed two factors and these accounted for approximately 64 percent of the variance (refer to Table 2). Twenty-one of the 22 items were used to delineate the components.

Table 2: Factor loadings of teaching self-efficacy items

Factor	Teaching item	Factor 1	Factor 2
<i>Factor 1 items</i>	Assigning grades	.905	-.095
	Providing feedback on assessment items	.881	-.071
	Assessing students' skills	.865	.000
	Responding to student feedback	.860	-.023
	Coordinating subjects	.835	-.017
	Marking assignments	.827	.035
	Designing subject assessment	.793	.084
	Setting exams	.778	-.086
	Preparing assignments	.737	.177
	Consulting with colleagues about coursework	.646	.136
	Supervising the teaching in a subject	.604	.208
	Developing subjects	.579	.190
	Consulting with students	.512	.332
<i>Factor 2 items</i>	Preparing tutorials	-.101	.964
	Delivering tutorials	-.111	.953
	Facilitating student discussion in class	.061	.714
	Delivering lectures	.130	.680
	Revising teaching strategies	.238	.661
	Keeping up to date and revising lecture material	.142	.652
	Preparing handouts	.279	.617
Selecting reading materials	.294	.499	

Finally, the majority of the service items, numbering 13, were aligned with two major factors accounting for approximately 59 percent of the variance (refer to Table 3). Interestingly, the small number of items which did not coalesce in the respective factor structures tended to be linked with specific information communications technology tasks.

Table 3: Factor loadings of service self-efficacy items

Factor	Service item	Factor 1	Factor 2
<i>Factor 1 items</i>	Responding to the media	.851	-.064
	Answering public enquiries	.837	.015
	Liaising with external agencies regarding courses	.786	-.067
	Consulting professionally	.760	-.030
	Advising prospective students	.640	.298
	Entertaining visitors on campus	.613	.224
	Liaising with external agencies about research	.606	-.155
	Participating in courses/programs outside the University	.513	.152
	Organising conferences/symposia	.448	.087
<i>Factor 2 items</i>	Participating and school/faculty committees	.042	.911
	Participating in university-wide committees	-.045	.867
	Chairing academic meetings	.071	.719
	Participating in professional associations	.347	.407

Next, eight subscales were derived from a grouping of the items as defined by the major factors. This derivation resulted by adding the raw scores of each item loading on a factor and then dividing by the number of items in the subscale. Descriptive labels of the subscales, as well as distributions for the two dichotomous measures used as independent variables in the study, are presented in Table 4.

Table 4: Descriptions of the subscales and the independent variables

Label	Description
Research Subscale 1	Reporting and supervising research
Research Subscale 2	Conducting and managing research
Research Subscale 3	Writing major works and reviewing articles/books
Research Subscale 4	Having a broad view of a research area
Teaching Subscale 1	Designing and assessing instruction
Teaching Subscale 2	Delivering tutorials and lectures
Service Subscale 1	Carrying out professional engagement activities
Service Subscale 2	Executing administrative tasks
Gender	Male=1 [n=170]; Female=2 [n=161]
Level of qualification	Masters degree or lower=0 [n=150]; Doctoral degree=1 [n=181]

The means, standard deviations, as well as the reliability coefficients of the eight subscales, are shown in Table 5. More detailed information about these subscales, including the kurtosis and skewness values, can be found in Hemmings and Kay (2008).

An inspection of the correlation matrix (n=331) presented in Table 6 reveals that all the subscales are positively and significantly related ($p < .01$). This examination also shows that the correlation coefficients of the subscales forming the three groupings were high, whilst the coefficients of the subscales across the groupings tended to be more moderate in magnitude. To illustrate, the coefficient for the Teaching Subscales 1 and 2 was .81, whereas the coefficients between the two teaching subscales and the four research subscales varied from .216 to .357.

Table 5: Means, standard deviations, skewness and kurtosis values, and alpha coefficients of the subscales

Measures	Subscales							
	Research subscale 1	Research subscale 2	Research subscale 3	Research subscale 4	Teaching subscale 1	Teaching subscale 2	Service subscale 1	Service subscale 2
Mean	6.73	6.27	5.65	6.46	7.57	7.68	6.37	6.56
Standard deviation	1.77	1.74	1.99	1.66	1.14	1.05	1.60	1.64
Skewness	-1.26	-1.04	-.68	-.89	-1.74	-1.49	-.74	-.76
Kurtosis	1.67	.91	.04	.59	6.29	4.32	.49	.23
Cronbach's alpha	.96	.94	.90	.80	.95	.92	.90	.85

Table 6: Correlation matrix

Measures	1	2	3	4	5	6	7	8
1. Research Subscale 1	1							
2. Research Subscale 2	.823*	1						
3. Research Subscale 3	.818*	.736*	1					
4. Research Subscale 4	.632*	.692*	.542*	1				
5. Teaching Subscale 1	.357*	.225*	.326*	.216*	1			
6. Teaching Subscale 2	.303*	.227*	.256*	.290*	.810*	1		
7. Service Subscale 1	.552*	.517*	.563*	.346*	.518*	.486*	1	
8. Service Subscale 2	.568*	.506*	.525*	.352*	.466*	.397*	.699*	1

*p<.01 (2-tailed)

A multivariate analysis of variance (MANOVA), based on a factorial design, was used to examine differences with respect to gender, level of qualification, and their interaction across the eight subscales. Significant differences were found for gender (Pillai's Trace = .092, $F[8, 320] = 4.040$, $p < .001$) and level of qualification (Pillai's Trace = .276, $F[8, 320] = 15.278$, $p < .001$). The gender x level of qualification interaction was also significant (Pillai's Trace = .050, $F[8, 320] = 2.094$, $p = .036$). Using a Bonferroni adjustment as a guide, an alpha level of $p < .005$ was set to provide a stringent interpretation of the univariate test results. Differences were found between male and female lecturers on Research Subscale 3 and Service Subscale 1. That is, males reported being more efficacious in performing tasks that pertained to writing major works and reviewing articles/books as well as undertaking professional engagement activities. Differences were also identified between those lecturers holding a masters degree or lower and those with doctoral qualifications on all four research subscales. To elaborate, those lecturers with doctoral qualifications reported more confidence in undertaking a range of research tasks such as planning, conducting, and discussing their research. It is worth noting that in spite of the significant multivariate result for an interaction effect, there was no significant univariate result for the gender and level of qualification interaction.

Substantial adjusted R² values of approximately 18 percent for the complete model for Research Subscale 1 and Research Subscale 2 were largely due to the influence of level of qualification. That is, those lecturers with a doctoral qualification tended to report being

more confident with respect to particular research activities. There was also a similar amount of variance accounted for in Research Subscale 3 by the combined significant main effects of gender and level of qualification. This result indicates that male academics and those with a doctorate were more likely to express confidence in writing major works and acting as a reviewer of this form of work. Finally, a smaller amount of variance (3.7 percent) was accounted in Research Subscale 4, which was again primarily due to level of qualification. The direction of this influence was the same as discussed earlier. In the case of the teaching and service variables, only one subscale, namely, Service Subscale 1, with 5.4 percent of the variance explained, merited mention and this was due to the effects of gender. Once again, males were more likely to report higher levels of self-efficacy and this was in respect to participating in professional engagement activities such as consultations with outside bodies and responding to the media.

Discussion

This study had three purposes. First, the dimensions of the self-efficacy construct for university academics were defined as research, teaching and service. Second, this study established items used to measure lecturer self-efficacy by using a principal components analysis. That is, lecturer self-efficacy could be delineated by a set of eight subscales: four research subscales; two teaching subscales; and, two service subscales. The research subscales were defined by items that respectively considered reporting and supervising research, conducting and managing research, writing major works and reviewing articles/books, and having a broad view of a research area. The teaching subscales drew on items that concentrated either on designing and assessing instruction or delivering tutorials and lectures. Finally, the items comprising the service subscales linked either to professional engagement activities e.g., responding to the media and liaising with outside agencies or administrative tasks such as participating in school/faculty committees and chairing academic meetings. All of the subscales had Cronbach's alphas in the highly reliable to very highly reliable range and were thus deemed psychometrically sound (Cohen, Manion, & Morrison, 2007). That is, other researchers can, with assurance, assess lecturer self-efficacy by tapping into its related dimensions. More work, however, is warranted to further validate and, in addition, test the applicability of the subscales in other Australian university settings, as well as the wider higher education context. Subsequent validation and testing could occur by using confirmatory factor analysis. For example, this form of analysis was undertaken by Forester, Kahn, and Hesson-McInnis (2004) to test the hypothesised factor structures of three research self-efficacy measures, namely, the Research Self-Efficacy Scale (RSES), the Self-Efficacy Research Measure (SERM), and the Research Attitudes Measure (RAM). Although these measures have arguably some relationship to the four research subscales produced in the present study, the RSES, SERM, and RAM were developed using the responses from North American graduate students rather than academics.

Not surprisingly, the level of self-efficacy for teaching (means of 7.57 and 7.56) was higher when compared with the respective research and service means. This result is in accord with previous Australian research findings reported by Schoen and Winocur (1988) and Bailey (1999). Interestingly, the relationship between all the teaching and the research

subscales were positive and significant, with the correlations varying from .216 and .357. This finding is at odds with a conclusion drawn by Bailey (1999) who stated that teaching self-efficacy and research self-efficacy were basically independent. Even though the correlations are not strong, they do indicate that a common thread is apparent and that further investigation of the two constructs is warranted.

The third purpose of the study was to test each of the lecturer self-efficacy subscales in light of gender differences and academic qualifications held. It was found that although there are no marked differences between male and female academics with regard to teaching self-efficacy, females are less confident in performing a range of research tasks. University managers would be well served if they focused their attention on building the confidence of female lecturers, low in confidence, by employing strategies such as mentoring. Appropriate mentoring from experienced researchers helps to achieve task mastery and to develop collaborative ventures (La Rocco & Bruns, 2006). Boosting confidence from positive research-based experiences, in low-threat settings, will more than likely lead to well-planned research and subsequent dissemination of that research in scholarly outlets.

In light of the fact that gender inequities have been evident in academe (see, for example, Becher & Trowler, 2001; Blackmore & Sachs, 2007; Skolnick, 2000), particularly at the professorial and senior management levels, it was pleasing to note that there was no significant difference recorded between male and female academics in terms of their self-confidence in the performance of administrative tasks (a component of the service dimension of self-efficacy). The relatively high level of self-efficacy reported by the females sampled suggests that tasks such as participating in university-wide committees and chairing academic meetings, integral to leadership positions within the sector, can be confidently performed. By logical extension, it can be argued that a solid foundation has been laid for those female academics seeking higher level administrative appointments.

Those faculty members new to the academy should find the list of items forming the various subscales a useful tool to promote discussion with an assigned mentor and other colleagues about the myriad of possible tasks expected to be performed across an academic career. Even though some faculty members, because of their appointment conditions, would not carry out all of these tasks, most faculty members would be required to execute the majority of the tasks in order to move through probation and gain subsequent promotion or salary increments.

In terms of qualifications, there was a significant difference in the level of research self-efficacy across the four research subscales. That is, those holding doctoral qualifications compared with those holding masters degrees or lower were more efficacious. Interestingly, no significant differences appeared between these two groups in relation to particular teaching and service subscales.

It is important to recognise several limitations of the present study. First, there may have been a bias in the study, as about two-thirds of the surveys distributed were not returned. However, subsequent testing did not show any substantial differences, with regard to

gender and rank, between the two sub-samples and their respective populations. Second, the study is potentially limited by the overall sample size. Still, it needs to be pointed out that the participants from the two institutions sampled represent approximately 5 percent of the staff members working in the public and private universities in Australia.

A final word

The results of this study complement existing research and fill a void with respect to the Australian higher education context and potentially other settings. Additionally, these results have implications both theoretically and practically. Such an assertion can be made since the research is grounded in self-efficacy theorising and interventions can be derived for lecturers. For example, university managers could implement structured and developmental interventions that influence research self-efficacy beliefs and lead to positive performance outcomes for academics. These same managers could also place restrictions on the requirements of newly appointed staff with respect to academic qualifications. Given the findings of this study, as well as claims from researchers such as Bazeley (2003), Hemmings and Hill (2009), and Major and Dolly (2003) about the merits of doctoral training and its strong link to research confidence, it would be judicious if managers limited, if possible, applications for continuing teaching and research positions to those holding doctorates. Apart from being, on average, more efficacious in terms of research, compared to those less qualified, these applicants are arguably more likely to produce greater research output and have more successful publication careers. In fact, in order to address the “continual ratcheting up of the productivity culture” that has developed throughout the Western higher education context, managers will need to consider this proposal for culling applicants (Finnegan & Hyle, 2009, p. 475). This is a radical proposal that unfortunately has a serious implication, that is, if implemented it would adversely restrict the pool of available applicants needed to meet a forecasted demand in the Australian higher education sector (Hugo, 2005).

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