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**FEATURE**

**The Relationship Between Research Knowledge  
and Research Output for College Faculty:  
An Asian Case Study**

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***Abstract:** Faculty participation in research is of increasing importance in institutions of higher education worldwide. A growing literature is springing up that explores faculty research output and ways of increasing it. This small (n = 71) study done at an international college in Asia explores and categorizes faculty members' understanding of their own competence, confidence, and experience in doing research. It also explores the relationships between knowledge of research skills and actual output.*

This paper is the second in a series focusing on barriers to faculty research productivity. The first study (Vyhmeister & Vyhmeister, 2007) found significant differences in perceived barriers between local and international faculty, with local faculty, particularly those not speaking English, perceiving greater barriers. Women perceived different barriers from men, focusing more on mentoring and statistics and lack of confidence, whereas men had more instrumental needs, such as funding and technical assistance, although both groups felt there was insufficient time for doing research. Faculty with doctoral degrees perceived significantly fewer barriers than those with only a master's or a bachelor's degree, with the less educated ones citing their lack of experience as their most important barrier, whereas those with a doctoral degree cited their lack of statistical knowledge as being what held them back the most.

Many faculty members come from professional fields where research is a secondary or tertiary goal compared to knowledge or ability in the content area. Many students do not have to write a thesis in order to complete their master's degree, and research is not necessarily integrated into the coursework of the degree program. Faculty from developing countries may have greater needs in these areas, and receive even less support (see for example Kramberg-Walker, 1993). This is the uniqueness of the current study—it focuses on the actual

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knowledge and experience of international college faculty in the area of research, to understand their needs in order to develop better support for faculty research development at a private international college in Southeast Asia.

### **Related Studies**

Many studies have been conducted to try to understand faculty research production and the barriers to it (see for example Fauber & Legg, 2004; Fox, 1992; Goodwin, et al., 2006; Sax, et al., 2002). Understanding the reasons why faculty do or do not publish is one way of attempting to discover and meet faculty needs for support in research. Fauber and Legg's (2004) study of barriers suggests that faculty believe that research negatively affects their teaching, and that they have low levels of support for research, as well as limited time. Goodwin et al. (2006) studied faculty recommendations for improving research publication at a teaching university in Denver.

In a large ( $n > 11,000$ ) international study including 10 countries, Teodorescu (2000) tried to develop a model of research production. He discovered that he was able to more accurately predict research production in countries with more developed research traditions. Teodorescu divided the reasons behind research production into four types: cumulative advantage, psychological-personal characteristics, disciplinary norms, and reinforcement. He concluded that in general, personal characteristics seem to play a much larger role than the other three areas in producing measurable results. Institutional focus on research did not actually enter into the predictive model in most of the countries studied. In a small study aimed at understanding why prolific writers produce as much as they do, Mayrath (2008) found similarly that they attributed their publication success to such things as collaboration, passion/curiosity, research skills, and time management.

Other results of studies on faculty research production are the following: 1) Between 40% (males) and 50% (females) of faculty have not published anything in the last 2 years (Green & Baskind, 2007; Sax, et al., 2002). 2) Faculty are publishing more than they used to (Sax, et al., 2002). 3) Faculty perceive research and writing as "add-ons" to their real work of teaching and service (see Green & Baskind, 2007; Seaberg, 1998). 4) Faculty say they allocate insufficient time to research, and wish for more blocks of time to spend on scholarship (Seipel, 2003; Seaberg, 1998). 5) Some studies have found that female faculty tend to publish less than males (Pfirman, n.d.; Sax, et al., 2002; Sheehan & Welch, 1996). Sax et al. demonstrate that this gap is narrowing rapidly; Teodorescu (2000) does not confirm that the gap exists. Gender differences may often be explained by other variables such as degree held, experience, rank, and grants received. Pfirman (n. d) suggests ways that women can reduce this deficit, such as collaborating with the same colleague on more

than one related study, freeing the most productive times of the day for research work, seeing who cites your research and collaborating with them, and taking advantage of meetings to network with people with similar research interests. 6) Some countries have included research production either as part of the contract for many higher education professors or part of a benefit package (Teodorescu, 2000).

Goodwin et al. (2006) suggest that a change in focus is needed from studies on why faculty do not publish to studies with an “explicit focus on activities specifically dedicated to increasing faculty members’ research skills and productivity” (p. 252). In an effort to assist faculty in improving their publication record, a Research Center was established, with a goal “to help each . . . faculty member establish a strong research record in disciplined, sustained, and focused inquiry that can impact practice and professional thought nationally” (p. 254). This center provided services such as consultation with experienced researchers, as well as the assistance of graduate students with data transcription, entry, literature review searches, group and individual training in the usage of specific research tools, and even editing. Goodwin et al. report on preliminary results of the work of this Research Center. These suggest an upward trend in publications and give helpful recommendations and lessons learned about assisting faculty with research.

Unfortunately, the area of research ability and success is one where faculty often seem particularly reticent to share with others their success or lack of it. The secrecy surrounding research and publication (whether ability or production), however, cannot continue as before, given today’s information society. As one academician put it:

Before the Internet, it was not so easy to find out who was productive, who was moribund, and who had a secret identity: . . . If a humanities scholar proclaimed that his work was ‘extraordinarily influential,’ there were few reliable citation indexes to prove him wrong. (Mentor, 2007, para. 7)

More and more, academic departments are recommending that publication, grants, teaching innovations, and service activities be recorded and compiled annually (see for example Chu, 2004), rather than being part of the ‘academic freedom’ rules that have in essence led to secrecy, and often a lack of development.

This new openness makes some uncomfortable, but it calls for a study like this one. The study of Goodwin et al. (2006) suggests that if we know more clearly what faculty know and what they do not know, and what they can do alone and what they feel they need help with, we can better design a support system that will meet their needs and help them achieve their research goals.

Given the typical reticence of adults to try something new, especially something they might not be well able to do, a supportive environment must be a part of the package if faculty are going to be willing to risk trying something they have never done before. This case study looks at the entire teaching faculty at one small international teaching college, to see what sort of help they need and want, what they really know, and what they have actually done in the area of research. This sort of information is typically kept very private, but when shared in this anonymous way, it can provide helpful information for the development of a research tradition in this college, and perhaps in other places, as well.

### **Method**

This case study analyzes a second part of the data set reported on earlier. The sample was all of the teachers ( $n = 71$ ) at a college in Asia, hereafter known as Asian College, who were present at a required in-service training for the faculty. The focus of this analysis is specifically related to Research Knowledge (both qualitative and quantitative), comfort and competence in performing specific research skills (or understanding of terminology), and the recency of use of each of the same concepts. Competence is measured on a 4-point scale, ranging from “Competent and comfortable to work with it alone,” through “Can do it with minimal help,” “would need quite a bit of help,” to “Am unfamiliar with this concept.” The Recency scale has 5 categories, ranging from “I have done this in the last 6 months” to “I have never done this.” It includes the option that the person did this as a student, but not since. Subscales for Research Knowledge include Quantitative Research, Qualitative Research, Referencing Techniques and Resources, Internet Sources, and Research and Publication Experience.

Knowing that actual research experience will develop confidence, correlations were expected to be seen between research knowledge and research participation. The data can also tell us just what knowledge base the college faculty have, and where the administration might do well to invest effort in in-service training and support.

When interpreting the recency of experience or usage of a particular technique, it should be noted that the scores for Experience are not a true scale. The first three categories are strict time scales, but “as a student,” though it represents a commonly understood time frame, is actually a categorical variable. As such, an average that rounds to a score near 4 may not actually indicate that the faculty performed the task as a student (which is the interpretation for 4), but may more rightly represent an average between those who have never done that particular activity, and those who did it a long time ago.

### Data

Each of the Research Knowledge subscales was tested for reliability and the resultant Cronbach's alpha scores ranged between .85 and .96. The overall averages for each subscale for both Research Knowledge and Research Experience are found in Table 1.

This summary table shows that of all the areas surveyed, faculty felt most comfortable with using the internet to find data, and with referencing the data found. These activities they felt they could do with minimal help. Even these, however, were not considered something the faculty could do without any assistance. Qualitative procedures were slightly less threatening than quantitative techniques, but actual knowledge about the publication process was the most lacking. The comparative column for experience shows that it parallels knowledge consistently.

*Table 1*  
Mean Scores for Research Knowledge and Research Experience

	<b>Knowledge</b>	<b>Experience</b>
Internet Sources	2.32 (can do it with minimal help)	2.88
Referencing Resources and Techniques	2.44	3.18 (more than 2 years ago)
Qualitative Procedures	2.81	3.81 (as a student)
Quantitative Procedures	2.92 (would need quite a bit of help)	3.81
Research Publication Experience	2.93	3.94
Knowledge:	1 = Competent and comfortable to work with it alone 4 = Am unfamiliar with this concept	
Experience:	1 = I have done this in the last 6 months 5 = I have never done this	

***Research Publication Experience***

The subscale on Research Publication Experience yielded an average Research Knowledge score of 2.93 on the 4 point scale, corresponding to “Would need quite a bit of help.” This confirms that in general, the faculty of Asian College are uncomfortable with publishing on their own. The Recency subscale had an average of 3.94, corresponding to the probability that faculty had published as a student, but not more recently. This may more likely be interpreted as an average between those who have never published and those who have published, but not recently, with only a few of the cases being those who only published while a student.

Publication data was divided into three categories. Since Asian College is run by a Christian church, publications oriented to church member readership were considered as one category of publications, followed by un-refereed journals, and then refereed journals. The number of individuals publishing was nearly identical across the three types of journals (see Table 2). Those faculty who have published in any category of journal, were a total of 25 individuals, with 10 of those having published in all three types of journal. (Note that numbers in this entire section do not add up: they represent individuals, and some individuals have published in more than one category). This means that 35% of the faculty have published something during their career, but only 25% have published while they were not students. Those who have published, however, appear to have broken through the barrier—that is to say, publication in any category is associated with publication in the other categories. In other words, those who publish, publish in multiple categories.

*Table 2*  
Types and Times of Publication

	Faculty who Published as a Student	Faculty who Published not as a Student	Total Faculty who have published
Church Journals	4	13	17
Un-refereed Journals	6	13	19
Refereed Journals	6	11	17
Total Individuals who published	8	18	25

Of the 18 who have published since their student days, however, only one published as a student. Seven published as students and not since then. This suggests that the oft-cited recommendation that developing publishing habits before students leave school is a good way to increase faculty publication later in their career may not be the solution to this problem.

The number of faculty who have never published anywhere was 36 (n = 71) however, with 10 missing cases, this number could be significantly higher (see Table 3). Of the 13 individuals who have published within the last 2 years, less than half (5/13) were PhD degree holders, of which there are 9 on the faculty. However, all four of the publications in refereed journals within the last 6 months belonged to this group. Total numbers of individuals who published within each time frame are listed in Table 3.

Overall, these numbers are not high. Faculty in this teaching college are, in general, not publishing much at all. The PhDs on the faculty have helped the average slightly, but even within that group, only about half of them have published within the last two years. As many as 75% of all faculty have not published anything since they were students, if they ever published at all.

### ***Quantitative Research***

Faculty of Asian College represent diverse disciplines. Theology professors, for example, frequently do not do empirical research. Because of this, the numbers of statistical usage or comprehension may be lower than what might normally be expected in other settings. In general, knowledge of quantitative techniques was low, and experience was even lower.

*Table 3*  
Recency of Faculty Publication by Category

	In the last 6 months	6 months to 2 years	More than 2 years	As a student	Total
Individuals who published	5	10	6	8	25
Individuals who have never published					36
Missing data					10
Total					71

On the average, those who felt comfortable with both statistical concepts and techniques, sufficiently to use them with little or no help, were a distinct minority. Across a selection of questions including bias, instrument design, validation, use of statistical software, variance, ANOVA, and factor analysis. Those who felt competent to work by themselves with these concepts were only 3 individuals out of 71. An additional 13 felt they could manage with minimal help, but a total of 55 individuals either had no idea what the concept meant, or felt they would need considerable help to accomplish it (see Table 4). For instance, only 16 have used statistical software since they were students, with 24 not having done it even as students (8 missing). The most common statistical techniques (mean, median, mode, standard deviation, correlation), however, have been used by close to half of the respondents, even though many of them did not use statistical software to calculate them. The question remains as to what statistical tools they used for these analyses.

These findings are not entirely out of line with results of other research (Goodwin et al., 2006). Faculty admitted to feeling rusty at research techniques, felt bad about the disconnect between teaching and research, and had the feeling that research often got crowded out. This data provides ample evidence that if the administration of Asian College desires empirical research output, they will need to invest in training, as most have never done quantitative research or have not done it in such a long time that they have forgotten how.

Further examination of recency of use data (see Table 5 for some examples) suggests a group of 15 or 16 individuals that have been doing statistical procedures since they finished school, a larger group of 20-24 who had some level of training in statistics as students but have not done it since, and 20-40, depending on the topic, who have never worked much with statistical techniques. Comparing this data to the 18 faculty members who have published outside their student days, half of them (9 individuals) have not used statistical software, or at least not since their student days.

*Table 4*  
Comprehension of Statistical Terms and Procedures

	Competent to do this alone	Can do it with minimal help	Would need quite a bit of help	Am unfamiliar with this concept
Faculty	3	13	39	16



***Qualitative Research***

In the qualitative research section, faculty generally felt they understood the differences between qualitative and quantitative research (2.18—can do it with minimal help), and understood the advantages of qualitative research (2.44), but when it came to the actual design and application, they felt they would need a great deal of help (2.93). This higher comfort level with qualitative research is not surprising, given that qualitative is more intuitive than quantitative, and easier for a novice to understand. When it comes to actually doing qualitative research, however, the numbers are smaller. That is, those who are comfortable with qualitative research do not necessarily all do it. This variation is normal, and is seen in the entire data set.

*Table 5*  
Recency of Use of Statistical Procedures

	While not a student	As a student	Never/ Missing
I design and create survey instruments.	27	24	20
I validate any new instrument before use.	18	25	28
I can operationalize a variable to represent a construct.	15	24	32
I use statistical software.	16	23	32
I implement experimental research	15	18	38
Mean, mode, median	33	23	15
Correlation coefficient	25	21	25
ANOVA	15	13	43
T-test	16	19	36
Multiple regression	11	20	40
Structural equation modeling	7	8	56

Table 6 shows some of the results for recency of qualitative research experience. It shows that more than half of the faculty have had some experience with qualitative research, and a smaller group of 17-20 have continued to work in this area even while not in school. The lower number of individuals who claim to use triangulation, which is a more complex technique which some may not know about, is typical. This repeats the pattern of quantitative research, where the common techniques were used by many, but the more complex ones were not well known. Interestingly, in all, 11 respondents said they have actually used qualitative data analysis software. Given how few people have used statistical software, this result needs further investigation, as it could simply mean they have used generic computer software to analyze their data.

### **Referencing Resources and Techniques**

In general, the faculty of Asian College were comfortable with their knowledge of referencing techniques in their professional field, with an average score of 2.44, meaning they can do this with minimal help. Of all the related questions, only the use of bibliographic software for referencing (3.18), spreadsheets or databases for referencing (3.15), and the use of reference librarians to support their literature review (2.79) averaged out to higher scores, with all other reference-related questions being between 2.07 and 2.30. This suggests an even higher comfort level with referencing techniques, though only 16 individuals said that they could do referencing alone, without assistance, and a total of 5 said that they knew nothing about referencing techniques.

*Table 6*

Recency of Application of Qualitative Techniques

	Not as a student	As a student	Never/ Missing
I can design qualitative data collection instruments.	20	20	31
I use triangulation as a part of any qualitative design.	10	15	46
I can analyze qualitative data.	19	17	35

Following the typical pattern, however, recency of use trailed knowledge by a notable margin, and in this case, separated the faculty into two disparate groups. While 25 had used referencing techniques in the last 6 months, 29 said they had never used referencing techniques, or had used them only as a student. This very quickly becomes suggestive of those who do and those who do not do research. A surprisingly high total of 15 say they have used bibliographical software since their days as a student, with 14 who have created a spreadsheet or database to keep track of references for their research. This contrasts with 35 (more than half of the respondents) who have never used software to assist in this task, even as students.

A surprisingly high group of faculty (24 individuals) said they were unfamiliar with the concept of using a reference librarian to assist in the literature review. This contrasts with 40 who have used a reference librarian's services at some point. Only 20 have used one after they were in school. Again, this may well indicate that the ones publishing are the ones using the reference librarians to support their research.

### *Internet Sources*

Using the internet for research was the area where faculty felt the most competent of all the areas of research, with a mean knowledge score of 2.32, which corresponds to being able to do it with minimal help. This comfort, however, varied significantly across different aspects of internet usage (see Table 7). The areas of least familiarity were in using more technical sources such as library journal databases, and Dissertation Abstracts. Significantly fewer of the faculty members were familiar with these resources.

*Table 7*  
Aspects of Internet usage

Question	Mean
I can search the internet readily to find references for research in my field.	2.03
I use the library database search resources.	2.48*
I use Dissertation Abstracts.	2.50*

\* Statistically significantly different from the first response at  $p < .001$ .

Following the typical pattern, mean experience for Internet usage for research was 2.88, which corresponds to an average of more than 2 years since the faculty have actually done this type of work (see Table 8). This data set is shown in its entirety, as it points out some areas of concern. Nearly half of the faculty have never used the more technical library resources to access quality journals or other research in their field. Of those who have used these resources, there is a large group who only did so as students, or at least have not done so within the last 6 months. Of the 18 faculty members who published since being students, only one has never used the library databases (2 missing cases). A total of 11 of the 18 say they have accessed current journals in their field online, and 7 of them have used Dissertation Abstracts. This supports the notion of a group who does and a group who does not publish, but does not solve the chicken or the egg question of which skill drives the other skills.

*Table 8*  
Recency of Use of Internet Techniques

	In the last 6 months	Not as a student but more than 6 months	As a student	Never/missing
I can search the internet readily to find references for research in my field.	24	11	17	19
I have a working mental list of how to identify trustworthy internet sites.	23	13	15	20
I use library database search resources to find references	15	13	8	35
I can access current journals in my field online.	20	14	7	30
I use Dissertation Abstracts to check current research in my field.	15	10	15	31

### **Discussion**

This study shows similarities with previous studies, but adds some interesting questions and answers. It is clear that in an international teaching college, faculty do not have a lot of experience with doing research. The data show that around half the faculty have never published anything, and similar proportions are not familiar with the tools of research, including statistical tools and software, library databases, and elements of research design. For Internet and referencing skills, the faculty feel they would need minimal help to accomplish it to their satisfaction. With the more technical aspects of research, however, such as qualitative and quantitative techniques and the actual publication process, most felt that they would need a great deal of support in order to accomplish it.

This study clearly points to a small group that is involved in research and some level of publication, but it is only about 25% of the total faculty of the school. Even among this group, knowledge is often limited to the more basic research skills, with room for growth in more complex techniques. The results of this study suggest what other researchers (e.g., Goodwin et al., 2006) have already concluded: it doesn't perhaps matter exactly what faculty know or do not know—if they are going to do research, they need to have support in the areas where they are weak.

This study details specific areas of weakness and relative strengths, and that detail might be put to good local use in planning research seminars. Overall, however, this level of detail may be quite unnecessary. While it is helpful to know what percent of faculty know or do not know certain things, in the end, the only solution is to provide ways of building up the skills that are lacking. There is a correlation between research knowledge and research production, but it is not altogether clear which one comes first. We know that adults tend to learn mainly skills that they have immediate use for, rather than something they might not need right away. This suggests that a better approach to increasing research production might be to involve faculty in asking questions that matter to them, and then to support them in learning the skills they need to answer those questions, rather than providing generic technical assistance and hoping for their curiosity to grow.

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