



The Development of IS Faculty: Toward a Maturing MIS Field

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Abstract

This article considers the place of doctoral dissertations as they pertain to research methodology in the MIS area. The paper compares research methodologies utilized in doctoral dissertations with previous findings related to dissertations, published articles and researcher views. It further subdivides the dissertations by research area and by the size of the doctoral program. The study finds that MIS dissertations cover a wide variety of areas, and that empirical research, particularly experimental research and field studies are the most common form of dissertation research methodology.

Keywords: MIS research methodology, MIS research, management information systems, MIS doctoral research.

ACM Categories: K.3.2

Toward a Maturing MIS Field

The MIS field is young and still evolving from its interdisciplinary roots. Reference disciplines include, among others: behavioral and computer science, information and organizational theory, economics and psychology. Two measures of maturity of a field are the breadth of research methods and the degree of empirical research used by its researchers. Orlikowski and Baroudi (1991) suggest a lack of diversity in MIS research methodology. While Cheon, et al., (1993) find that IS research has made little progress in increasing empirical research since 1980, Alavi and Carlson (1992), using a larger database of journals, have found an increase in laboratory experimentation and field studies over the last 20 years.

It is the purpose of this study to examine research methodologies utilized in MIS doctoral dissertations written during the period 1987-90, with the intention of addressing the measures of maturity mentioned above. In particular, we seek to discern if there are any preferred research strategies in the discipline and if there has been any movement toward more empirical work. In the process this study considers whether current dissertation research methodologies differ by area of interest and size of doctoral program.

An early discussion of research methodologies dealing with "computer based management information systems" (Van Horn, 1973) derived classifications of empirical research: case studies, field studies, field tests and laboratory studies. Ives, et al., (1980) modified the Van Horn schematic by adding a nondata conceptual or methodological study category and utilized that classification system to analyze MIS doctoral dissertations during the period 1973-79. Vogel and Wetherbe (1984) analyzed leading journals and universities during the period 1977-83, and in the process modified the listing again, this time breaking the nondata categories into three parts: theorem proof, engineering and subjective argumentative. Teng and Galletta (1990) utilized the Vogel and Wetherbe categorization, with the exception that field, study was replaced with survey, to sample academic views on research methodology.

Methodology

MIS dissertations were identified from various issues of the *MIS Quarterly* (—, 1988; Hamilton, et al., 1989, 1990, 1991) and the areas of interest and research methodologies were derived from Dissertation Abstracts International (Section A, 1987-1991; Section B, 1987-1991). Areas of interest were divided between business/information science and other. Areas were determined by dissertation authors themselves, who self-selected the area of interest. Business and information science were categorized together since these two categories comprise 60% of the degrees from the upper half of doctoral programs (as defined below) and because review of abstract information suggests that many of the information science dissertations emanate from management information systems programs.

Research methodology was defined by the Vogel and Wetherbe taxonomy with two exceptions. First, the term field study is used instead of survey to reflect the broader general interpretation of that term. Second, while theorem proof, engineering and subjective/argumentative were evaluated as separate categories, they are presented in a single nondata group in the presentation that follows. This simplifies the tables and does not materially effect the results. The particular research methodology for each dissertation was specified via three independent reviews of each dissertation abstract. A dissertation was classified by the methodology that was found on at least two of the

reviews. In 3% of the cases each review specified a different classification. These were deemed unknown methodologies.

Results

During the period from 1987-90 there were 402 dissertations designated as MIS dissertations. Table 1 classifies dissertations by area of interest and research methodology. It shows MIS research to be interdisciplinary in nature, only half of all dissertations being in the area of business and information science. Of the rest, 25% are in computer science or engineering, 14% in either education or psychology, and 10% in categories ranging from agriculture and biostatistics to speech communication and urban/regional planning. It also shows that 68% of dissertations

Table 1: Methodology and Self Selected Area

	Business/ Info Science		Other Areas		Total	
	No.	%	No.	%	No.	%
Case	13	6.7	16	8.2	29	7.4
Field Study	86	44.3	51	26.0	137	35.1
Field Test	13	6.7	8	4.1	21	5.4
Experimental	62	32.8	65	33.2	127	32.6
<u>Non data</u>	<u>20</u>	<u>10.3</u>	<u>56</u>	<u>28.5</u>	<u>76</u>	<u>19.5</u>
Total	194	100	196	100	390	100

Twelve dissertations' methodologies were unidentifiable
Chi Square = 30.529
p value < .0001

are either field studies or experimental, while nondata studies make up 20%.

A Chi Square test on the data in Table 1 indicates that the null hypothesis of statistical independence is to be rejected. Analysis of the table suggests that the business/information science area utilizes more field studies, while other areas use more nondata-type research. In fact 43 of the 56 nondata "other" dissertations are from engineering and computer science, a conclusion consistent with the definition of nondata research.

The diversity of the field is further evidenced by the fact that, while in 1989 there were 61 institutions granting doctorates in business with concentrations in information systems (Jarvenpaa, et al., 1991), 142 schools produced dissertations which could be construed as MIS related. Twenty four programs were responsible for 196 of the dissertations (slightly below half), while 118 programs turned out 206 dissertations (slightly more than half). (Subsequent analysis will refer to these programs as upper half and lower half, respectively.) Upper-half programs utilized more field studies and experimental research, while lower-half programs had more nondata research. Note that while some differences exist, a test for statistical independence at the 5% level is not rejected.

Table 2: Research Methodology and Size of Program

	Upper Half		Lower Half		Total	
	No.	Pct	No.	Pct	No.	Pct
Case	11	5.8	18	9.0	29	7.4
Field Study	72	37.9	65	32.5	137	35.1
Field Test	9	4.7	12	6.0	21	5.4
Experimental	70	36.8	57	28.5	127	32.6
Nondata	<u>28</u>	<u>14.8</u>	<u>48</u>	<u>24.0</u>	<u>76</u>	<u>19.5</u>
	190	100.0	200	100.0	390	100.0
Total						
Chi Square = 8.819						
p value < .0658						

When results are compared with an earlier study of dissertations (Ives, et al., 1980), a greater percentage of experimental studies are being done with less nondata research than the earlier period. These results may reflect a maturing of the discipline: training in empirical research is being emphasized in the discipline.

Table 3: Comparisons of Percentages in Prior Studies

Study	Ives, Hamilton, Davis	Teng, Galletta	Current Study
Subject	Dissertations	Survey	Dissertations
Timeframe	1973-1979	1990*	1987-1990
Case	15.3	22	7.4
Field Study	34.0	23	35.1
Field Test	2.0	12	5.4
Experimental	15.0	14	32.6
Nondata	<u>33.7</u>	<u>28</u>	<u>19.5</u>
Total	100.0	100	100.0

* date of publication

There is a dichotomy between dissertations and current research activity (Teng and Galletta, 1990). Research focused on nondata (28%), field study (23%) and case (22%) research, whereas dissertations tended toward field studies (35%) and experiments (33%). It is interesting to note the higher percentage of experimental dissertations in light of the fact that this methodology (along with field tests) is endorsed to a greater extent than it is used by researchers (Teng and Galletta, 1990 p. 5, 6).

Tables 4 and 5 compare upper-half and lower-half dissertation programs with leading and other publishing institutions. Approximately 75% of the upper-half program dissertations used either field study or experimental, about twice the percentage used in journal articles from leading publishing institutions. In addition, there are fewer nondata dissertations than nondata journal articles. Lower-half programs also produced more field and experimental studies and fewer nondata studies than research published by other institutions.

Table 4: Leading Publishing Institutions and Upper-Half Dissertation Programs: Percentage Comparisons

Study Subject Timeframe	Vogel, Wetherbe Journals 1977-1983	Lending, Wetherbe Journals 1984-1990	Current Study Dissertations 1987-1990
Case	20.3	19.6	5.8
Field Study	36.3	27.4	37.9
Field Test	11.4	3.4	4.7
Experimental	9.0	10.4	36.8
Nondata	<u>23.0</u>	<u>38.2</u>	<u>14.8</u>
Total	100.0	100.0	100.0

Table 5: Other Publishing Institutions and Lower-Half Dissertation Programs: Percentage Comparisons

Study Subject Timeframe	Vogel, Wetherbe Journals 1977-1983	Lending, Wetherbe Journals 1984-1990	Current Study Dissertations 1987-1990
Case	14.3	16.0	9.0
Field Study	27.9	28.9	32.5
Field Test	11.4	4.1	6.0
Experimental	20.7	10.9	28.5
Nondata	<u>25.7</u>	<u>40.1</u>	<u>14.0</u>
Total	100.0	100.0	100.0
* date of publication			

Conclusions

A small number of schools produce a significant number of the dissertations in the areas of business and information science. While field studies remain the preponderant dissertation research strategy, the last decade has seen a shift from nondata to empirical research, through a rise in experimental studies. This may reflect a strong endorsement of experimental techniques by current researchers. There is also a greater utilization of experimental methodologies and a lower usage of nondata techniques in dissertations than found in the research journals. This greater utilization of experimental methodology and training in empirical methods suggests a further maturing of the field. It remains to be seen whether this research strategy at the dissertation level will eventually lead to an increase in experimental studies in the journal literature.

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