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A qualitative review of doctoral dissertations on management in Taiwan

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Abstract. The doctoral dissertation is viewed as the capstone to the doctoral program. This study reviews the research topics and methodologies of management doctoral dissertations from 1988 to 1994 in Taiwan. The results of the qualitative analysis of the 120 dissertations are reported as follows: (1) financial management attracted the greatest share of the attention of the doctoral students, followed by information management; (2) over half of the dissertations were discipline based with mathematics, psychology, economics, and computer science being the most common disciplines; (3) over half of the dissertations were predominantly causal; (4) in the case of empirical dissertations, survey methods were mostly used, while mathematical modeling was frequently applied in the case of the non-empirical studies; and (5) most of the empirical studies involved the information industry. In addition, future directions for management doctoral research are also provided.

Introduction

When national economies falter, or when market share is lost, management education can easily become a scapegoat for the failures of a system (Willmott 1994), not to mention the disturbances that result in the world economy. A case study by Linder and Smith (1992) has turned management education into a burning issue. Due to the fact that most of the teaching faculty in Taiwan received their professional education in the United States, it is not surprising to find that the issues discussed and commented on are of considerable interest to management education in Taiwan, even though the case studies relate to the US.

This paper reviews the current status of doctoral management education in Taiwan and suggests directions for its future development. Two general methods are used in this study, namely historical and statistical. We first present a brief profile of management doctoral programs in Taiwan in order to provide a better understanding of the current status of doctoral education in this country. Then, published dissertations resulting from these programs are analyzed statistically to provide a baseline for a qualitative evaluation

Table 1. Doctoral programs in management offered in Taiwan

	Year established	No. of graduates*	Present enrollment
Tamkang University	1975	47	26
National Chengchi University	1976	76	40
National Chiao Tung University	1981	28	49
National Taiwan University	1987	20	86
National Sun Yat-sen University	1988	6	48
Chinese Culture University	1992	0	13
National Chung Hsing University	1993	0	15
National Cheng Kung University	1993	0	8
Total		177	285

*Till the end of 1994.

of the state of management doctoral education. Some recommendations and concluding remarks follow.

Background

During the past four decades, the Taiwan economy has rapidly developed. The increasingly expanding economy has generated an urgent and acute need for management skills, which in turn has stimulated the rapid development of management education. The first graduate school of management in the Republic of China to offer a program leading to a Ph.D. degree was the Graduate Institute of Management Science at Tamkang University which initiated its program in 1975. The next year, another Ph.D. program was offered by the Graduate Institute of Business Administration at National Chengchi University. A third management program at the Ph.D. level was added in 1981 at National Chiao Tung University. Since 1990, Ph.D. programs in management have expanded rapidly. As of today, there are eight Ph.D. programs in management that have been inaugurated in the Republic of China on Taiwan (see Table 1). The educational purpose of these programs is to cultivate and produce outstanding academic professionals in teaching and research to meet the needs of the nation in terms of its industrial and business development.

The doctoral program in management in Taiwan has now been in existence for nearly two decades. As of the end of the year 1994, there were more than 280 students enrolled in doctoral programs in management, accounting for 4% of the total number of doctoral students in Taiwan, which is not a large share by anyone's standards. In terms of output, since the time when the first

doctoral student of management graduated from Tamkang University in 1978, nearly 180 management Ph.D.s has so far been awarded in Taiwan. Since the doctoral programs offered by three of the universities were established after 1992, namely Chinese Culture University, National Chung Hsing University and National Cheng Kung University, there have not yet been any graduates from these three universities. The number of Ph.D. graduates in management will thus increase rapidly in the near future.

In Taiwan, students wishing to enter a doctoral degree program must pass an entrance examination conducted by the university. Since 1990, a special program has also been available through which students in master's degree programs, who have earned a grade-point average of 85 or higher for their first year of study, are ranked in the top one-third of their class, and have shown a strong capacity for independent research, may apply for direct admission to the doctoral program in their respective institute. In addition to the regular full-time students, some qualified students from government and industry are enrolled in Ph.D. programs through on-the-job training programs sponsored by their respective organizations. Most of them are part-time students. Like the regular full-time students, they must pass the entrance examination to become eligible for enrollment in the graduate programs, and must also successfully complete the graduate program requirements to earn the degree.

To become formal candidates for the doctoral degree, graduate students must pass a qualifying examination. In most schools, students who do not pass the qualifying examination within two or three years of entering a doctoral program (excluding leaves of absence) will be dismissed from the university. Graduate students, in addition to their course work, are also involved in research projects that are sponsored by the National Science Council, government and industry and which are under the supervision of advisors. These projects usually serve as an exploratory or feasibility study, and sometimes as a potential framework for the students' doctoral dissertations. The maximum period of time allowed for completing the requirements for the doctoral degree is determined by the regulations of the respective graduate institute concerned.

Since education is strongly emphasized in Taiwan, public universities have relied mostly on national governments for financial support during the last four decades. Over 60% of the operating expenditure and capital investment of a typical university is subsidized by the Ministry of Education, the remainder depending mainly on fund-raising and partly on students' fees. For each doctoral enrollment, the Ministry of Education subsidizes NT$4,000 (about US$150) for operating expenditure and NT$32,550 (about US$1,200) for expenditure on books, equipment and facilities. Thus each graduate students only pays part of the overall educational cost by meeting the tuition

and miscellaneous fees, which amount to about NT$15,000 (about US$550) per semester. Furthermore, all full-time doctoral students receive a monthly stipend of NT$8,000 (about US$300) and the top 10% are awarded a scholarship of NT$15,000 (about US$550) for the first three years, which is provided by the Ministry of Education. After completing their doctoral education, most recipients of doctoral degrees devote themselves to academia and teach in colleges or universities in Taiwan, while some take up managerial or research positions in government, business or non-profit research organizations.

If we take National Chiao Tung University as an example, the doctoral programs in Management Science prepare students with strong backgrounds in the mathematical or systems sciences for careers in research and/or teaching in management science and related fields. The programs cover a broad area and are interdisciplinary, the students coming from various universities with diverse backgrounds. Approximately twelve students enter the program each fall. Applicants are judged on the basis of scholastic record, letters of recommendation, and Entrance Test scores (including written and oral tests). Current enrollment is 49 Ph.D. students, of which 33 are full-time students and 16 are on-the-job-training students. The majors of these students' master's degrees include accounting, business administration, chemistry, computer science, economics, education, industrial engineering, information management, library science, management science, nuclear engineering, statistics, transportation engineering and management. All students entering the program are expected to take courses that provide an adequate analytical foundation for research in the following fields: decision sciences, financial economics, marketing, operations and technology management, and organization theory. Since workshops are known to greatly improve research quality, a series of three workshops (a workshop on Management Science, a workshop on discussing journal papers, and a workshop on dissertation topics) is carefully designed for students. All students are required to attend at least one of the three workshops each semester, and to participate in many lively research discussions, in order to make it easier for the students to formulate their research topics. Students should complete a minimum of 18 credits of coursework and pass a qualifying examination in order to gain admission to Ph.D. candidacy. To qualify, students must pass examinations in the following eight subject areas: Production Management, Financial Management, Marketing Management, Management Information Systems, Human Resource Management, Operations Research, Econometrics, and Statistical Methods and Data Analysis. In addition, Ph.D. students are required to complete 12 credits by means of their dissertation in order to receive the degree.

Although the field of management has grown very rapidly over the past two decades, there has been little systematic assessment of the characteristics of

research studies in the field. One thing particularly lacking is an appraisal of doctoral dissertations, which constitute a significant proportion of research in this field. The Ph.D. awarded by universities in Taiwan is a research degree certifying that the recipient has the capability and training needed to engage in independent scholarly work. As Porter and Wolfle (1975) point out, "the doctoral dissertation is the major distinguishing feature of education for the Ph.D., which traditionally has a dual role: (1) to make a positive, original, and significant contribution to knowledge; and (2) to provide training in research and scholarly techniques." Consequently, the dissertation may be viewed as reflecting much of academic and intellectual culture. Most obviously, the dissertation reflects the capabilities of the candidate – the training received, the technical skills and the analytical and writing abilities developed (Isaac, Quinlan & Walker 1992). Perhaps even more important is to identify the student as a potential future contributor to the field, since the research problem initiated in a dissertation usually constitutes the foundation of research projects subsequently conducted by the student/author after his graduation. The dissertation is an end and a beginning – it ends an academic training process and begins an academic career of research, publication, and teaching (Carr, Cheney and Mann, 1986). However, few studies on graduate education in management have paid much attention to the evaluation of the dissertation. The authors have thus reviewed management dissertations in Taiwan to determine the orientation of the research content and the nature of the research design. The results we obtain should be of value to future doctoral candidates, practitioners in the field, and faculty responsible for directing management curricula.

Research method

Doctoral dissertations published by five graduate schools of management from 1988 to 1994 form the population for this analysis. Included are 120 dissertations. Each dissertation has been content-analyzed and coded according to 10 variables, about half of them reflecting purely descriptive information and the others requiring some interpretation of the content of the dissertation. These variables are discussed briefly below and the Appendix presents the complete coding scheme.

For identification purposes, primarily descriptive information is provided by four variables: year of graduation, name of the university graduated from, name of the graduate student, and the title of the dissertation. Six other categories are used to record information about the topic and the methodology adopted.

Research topic

The research topic refers to the substantive focus of the research questions addressed by the dissertation. The topic was categorized into nine categories in terms of the business functions and the issues of the most concern to the academics and practitioners, namely general management, production and operations management, marketing management, human resources management, financial management, information management, strategic management, technology management, and quantitative methods. These categories also conformed to the Ph.D. programs designed by the graduate schools of management in Taiwan.

Discipline base

The discipline base of the dissertation refers to whether the theoretical perspectives adopted are anchored in one of the disciplines of the most concern to the academics in management. This concept was inspired by Shrivastava and Lim (1989) who examine the disciplinary orientation of doctoral dissertations in strategic management according to social science disciplines. While taking into consideration the multi-disciplinary and interdisciplinary character of management research, the discipline base in our analysis has been expanded to cover a relatively broad range of disciplines and has not been restricted to the social science disciplines. After consulting the intellectual background and interests of faculty members in the graduate schools of management in Taiwan, the discipline base of doctoral research in our study includes accounting, computer science, economics, education, engineering, law, linguistics, mathematics, psychology and sociology.

Research design

The research design constitutes the blueprint for the collection, measurement, and analysis of data (Phillips 1971). Although research designs may be classified in accordance with many criteria, the most useful one concerns the major purpose of the investigation. On this basis we may identify the broad classes of research designs as exploratory, descriptive, and causal (Green, Tull and Albaum 1988; Emory and Cooper 1991; Zikmund 1991). Exploratory research is conducted during the early stages when the researcher is uncertain about the nature of the problem. Through exploration, the researcher develops the concept more clearly, establishes priorities, and in many other ways improves the final research design. When the researcher is aware of the problem but not completely knowledgeable about the situation, descriptive research is usually conducted. In contrast to the flexibility afforded by the exploratory study, the descriptive study should be planned carefully with respect to the sources of information to be consulted and the procedures to be used in collecting information (Green, Tull, and Albaum 1988). Causal

Table 2. Classes of research design

	Exploratory research	Descriptive research	Causal research
Context	1. To be appropriate for the total study in a subject area where the developed data are limited. 2. To be the first stage of a research and to be used to orient the research and enhance the direction of the research.	1. To be used in studies with substantial structures and where specific hypotheses are to be tested or research questions answered.	1. To be conducted to identify cause-and-effect relationships among variables where the research problem has already been narrowly defined.
Objectives	1. To diagnose the situation in order to clarify the nature of the research, to crystallize the dimensions of the problems, and to establish priorities for research. 2. To screen alternatives using concept testing. 3. To generate new ideas.	1. To describe phenomena and characteristics associated with a subject population, such as who, what, when, where and how. 2. To estimate proportions of the population that have certain characteristics. 3. To discover associations among different variables.	1. To determine and measure the effect that a variable(s) has on another (or others). 2. To explain why certain outcomes are obtained.
Means	1. Secondary Data Analysis. 2. Experience Surveys. 3. Pilot Studies: such as focus group interviews, case studies, projective techniques, and in-depth interviews.	1. Survey 2. Observation 3. Secondary research. 4. Case study.	1. Experimental design. 2. Ex post facto design.

research designs require sharply-defined problems. While the essential difference between descriptive and causal studies lies in their objectives. If the research is concerned with finding out who, what, where, when, or how much, then the study is descriptive. If it is concerned with learning why, that is, how one variable affects another, it is causal (Emory and Cooper 1991).

Table 2 summarizes the context, objectives and means of the various classes of research design. Since research design is a complex concept, the distinction between exploration, description and causality can be quite ambiguous. Furthermore, the techniques used depend on both the nature of the research

and the methodology of the researcher. Thus the same research method can be conducted in the case of each different research design. A case study, for example, may serve descriptive, illustrative, experimental, exploratory or explanatory uses (Scapens 1990). In the final analysis, it is the intention of the authors to determine the appropriate classifications which are listed in Table 2.

Research methodology
The research methodology was adapted from the taxonomy by Perry and Kraemer (1986). The categories of this taxonomic variable reflect general methods of inquiry used in the social sciences, which include logical argument, mathematical modeling, simulation, literature review, and empirical analysis. Methods involving empirical analysis are further analyzed as below.

Method of empirical analysis
The method of empirical analysis is summarized from research methods applied to empirical observations only. The categories of this variable include case study, field study (involving site visits and personal interviews with subjects), secondary research, survey (including interviews, self-administered and mailed questionnaires), and experimental design (including field experiments, laboratory experiments, and quasi-experiments). Each category within the taxonomy represents increasing internal validity.

Industry of empirical analysis
Finally, the industry of empirical analysis is also assessed to examine and categorize the industries in our empirical studies. Our primary concern is to trace the tendency of concentration.

Results

The yearwise distribution of these 120 dissertations is shown in Table 3, as evidence of the rapid growth of the field.

Research topic
The distribution of dissertations according to research topic, as shown in Table 3, demonstrates the broad distribution of doctoral research in the field. Financial management is the dominant category (18%). No topical area accounts for more than 20% of research, but five topics represent more than 10% each, namely, financial management, information management, human resources management, general management, and quantitative methods. Marketing management and technology management attract the least attention of

Table 3. Distribution of management dissertations by research topic

	1988	1989	1990	1991	1992	1993	1994	Total	Percentage
Financial management	1	0	3	1	4	7	6	22	18.33%
Information management	3	2	1	1	3	1	7	18	15.00%
General management	0	2	1	1	4	1	5	14	11.67%
Human resources management	3	2	1	1	3	3	1	14	11.67%
Quantitative methods	1	1	1	3	3	0	5	14	11.67%
Production management	0	0	1	1	1	4	4	11	9.17%
Strategic management	0	2	3	1	2	1	2	11	9.17%
Marketing management	0	0	0	0	1	5	2	8	6.67%
Technology management	0	2	1	0	2	1	2	8	6.67%
Total	8	11	12	9	23	23	34	120	100.00%

the doctoral candidates. Other topics include production management, and strategic management.

Though the data are not shown in Table 3, each topic was further analyzed to summarize the core issues studied. About 68% of doctoral research in financial management focused on the stock market. This signifies a high concentration of dissertations in financial management and properly reflects the prosperity of the stock market in this country. Studies related to the environment in which organizations find themselves are subjects of concern for doctoral students in information management. The major issues discussed in general management are decision-making, corporate culture, public risk, etc. Dissertations dealing with employment account for the highest percentage (46%) in human resources management. Quantitative studies can be divided into two main categories, namely, statistics and operations research. Manufacturing strategy, and flexible manufacturing systems are the major issues studied in production management which has attracted much attention by doctoral students since 1993. Using the taxonomy of Shrivastava and Lim (1989), strategy formulation, environmental analysis, and strategy implementation/evaluation are the focal area in strategic management among the dissertations reviewed,

Table 4. Distribution of management dissertations by discipline base

	Single discipline	Multi-discipline	Discipline base	No discipline	Total
Financial management	7	1	8	14	22
Information management	7	5	12	6	18
General management	8	3	11	3	14
Human resources management	8	1	9	5	14
Quantitative methods	14	0	14	0	14
Production management	8	0	8	3	11
Strategic management	2	1	3	8	11
Marketing management	4	0	4	4	8
Technology management	0	0	0	8	8
Total (percentage)	58 (48.33%)	11 (9.17%)	69 (57.50%)	51 (42.50%)	120 (100.00%)

while no dissertation is devoted to goal formulation. Marketing management has been an emerging area since 1993 in terms of dissertations. Following the classification of Zaltman & Burger (1975), products/services, markets, and policy are the focal areas of doctoral degrees in marketing management. The dissertations in technology management are devoted to R & D strategy and technology capabilities.

In addition, there is some important information not shown in Table 3, but worth noting. Among the 120 management dissertations reviewed, only four dissertations contributed to non-profit organization management. The organizations explored were hospitals and libraries. Furthermore, three of the dissertations analyzed were involved with the study of public utilities management. The research subjects were public risk and power utilities. There were still two dissertations that focused on international business management and one dissertation dealt with comparative management. Another thing worth mentioning is that the research in each of the above four areas was conducted after 1992, reflecting the emerging nature of these areas of study.

Discipline base

As shown in Table 4, a large number of studies (48%) were based on single disciplines. Another equally large number of dissertations (43%) were not anchored to any other disciplines in nature. The most common discipline base was mathematics, with 28 dissertations (23%). Next came psychology, with 17 dissertations (14%). Economics (13 dissertations, 11%) and computer science (12 dissertations, 10%) also played an important part in management doctoral research, while other disciplines were used infrequently. The most striking finding is that the multi-disciplinary based categories accounted for only 9% of all dissertations. This is surprising for a field of study that claims to be multi-disciplinary and interdisciplinary (Burgoyne 1994).

In terms of research topics, quantitative methods accounted for the largest number of discipline bases with 14 dissertations (12%) which were predominantly based on mathematics, followed by information management (12 dissertations, 10%) which was chiefly linked to computer science, and general management (11 dissertations, 9%) which mainly imported the theory of psychology. Technology management exhibited no explicit coherence to any discipline. In terms of disciplines which formed the bases of the dissertations, mathematics was primarily imported by the dissertations on quantitative methods and production management, respectively. Furthermore, psychology was mainly adopted by the dissertations on human resources management and general management, respectively.

Research design

Causal research was engaged in the most frequently (47%) in management doctoral studies, followed by descriptive research (31%), and last of all by exploratory studies (23%), as reflected in Table 5. In terms of the research topics, about 77% of the dissertations in financial management were predominantly causal as were 79% of the quantitative methods of management dissertations. This finding testifies to the well-grounded theory in these two fields. By contrast, researchers in general management (57%) and information management (56%) usually elaborated their theories by conducting exploratory research, reflecting the emerging nature of these two fields.

Research methodology and empirical analysis

Table 6 shows that the research methodology used in management dissertations varies in roughly equal proportions between empirical (52%) and non-empirical studies (48%). To our surprise, the questionnaire/survey accounts for a relatively large share (68%) of empirical analysis which was primarily the result of studies in human resources management, strategic management, and technology management. Only two dissertations adopted case studies dealing with information management and technology management respec-

Table 5. Distribution of management dissertations by research design

	Exploratory research	Descriptive research	Causal research	Total
Financial management	1	4	17	22
Information management	10	4	4	18
General management	8	5	1	14
Human resources management	2	7	5	14
Quantitative methods	0	3	11	14
Production management	0	4	7	11
Strategic management	2	3	6	11
Marketing management	3	1	4	8
Technology management	1	6	1	8
Total (percentage)	27 (22.50%)	37 (30.83%)	56 (46.67%)	120 (100.00%)

tively, while there were four dissertations that used experimental design to explore issues related to general management and marketing management.

As for non-empirical studies, mathematical modeling was used the most frequently (60%), followed by logical argument (31%). Only one dissertation in general management engaged in a literature review. However, mathematical modeling was predominantly used by researchers in quantitative methods (36%) and financial management (21%), while in general management and human resources management, logical argument was most commonly applied. Though the data are not shown in Table 6, 90% of the dissertations reviewed were cross-sectional rather than longitudinal studies.

Industry of empirical analysis

As indicated in Table 7, a large number of empirical studies were subjected to a single industry (41%). The electronics and information industries have played a pivotal role in the empirical studies of management dissertations. Since the information industry in Taiwan is flourishing and well-developed, its marketing management, strategic management, and technology manage-

Table 6. Distribution of management dissertations by research method

	Non-empirical					Empirical					
	Mathematical modeling	Logical argument	Simulation	Literature review	Total	Case study	Field study	Secondary research	Survey	Experimental design	Total
Financial management	8	1	3	0	12	0	0	7	4	0	11
Information management	4	5	0	0	9	1	4	0	4	0	8
General management	1	8	0	1	10	0	1	0	2	3	6
Human resources management	1	1	0	0	2	0	0	0	12	0	12
Quantitative methods	14	0	0	0	14	0	0	0	0	0	0
Production management	6	0	2	0	8	0	0	0	3	0	3
Strategic management	3	2	0	0	5	0	0	0	6	0	6
Marketing management	2	2	0	0	4	0	0	0	3	1	4
Technology management	0	1	0	0	1	1	1	0	6	0	7
Total (percentage)	39 (31.45%)	20 (16.13%)	5 (4.03%)	1 (0.81%)	65 (52.42%)	2 (1.61%)	6 (4.84%)	7 (5.65%)	40 (32.26%)	4 (3.23%)	59 (47.58%)

Table 7. Distribution of management dissertations by industry of empirical analysis

	Single industry	Multi-industry	No industry	Non-empirical	Total
Financial management	0	0	11	11	22
Information management	1	5	3	9	18
General management	1	0	3	10	14
Human resources management	6	5	1	2	14
Quantitative methods	0	0	0	14	14
Production management	2	1	0	8	11
Strategic management	5	1	0	5	11
Marketing management	3	0	1	4	8
Technology management	5	2	0	1	8
Total (percentage)	23 (19.17%)	14 (11.67%)	19 (15.83%)	64 (53.33%)	120 (100.00%)

ment are all worth learning and exploring from the perspective of management research. In our analysis, technology management (50%), and human resources management (43%) are most frequently studied in the information industry. This finding is further evidence that supports the economic progress that has characterized this country. There were a number of dissertations (25%) that focused on more than one industry in order to generalize their implications. In terms of research topics, human resources management, technology management, information management, and strategic management were primarily industry-oriented.

Historical trends

As a means of identifying changes in doctoral research topics, the dissertations were categorized into two periods, 1988–1991 and 1992–1994.

The broad distribution of dissertations by topic during these two periods reveals some significant changes. Figure 1 indicates that technology management, strategic management, quantitative methods, human resources

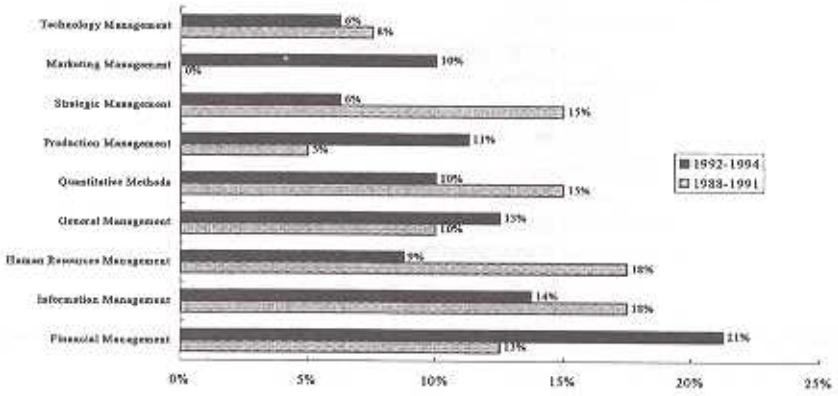

Figure 1. Comparison between 1988–1991 and 1992–1994 distribution of dissertations by research topic.

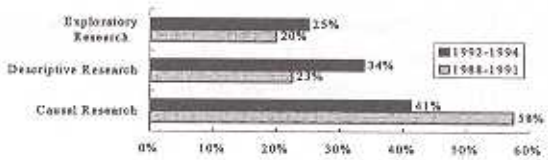

Figure 2. Comparison between 1988–1991 and 1992–1994 distribution of dissertations by research design.

management and information management all decreased in terms of their significance as a relative proportion of the total number of dissertations over the two periods. Of these, dissertations on strategic management and human resources management declined by more than half during these two periods. By contrast, marketing management, production management, general management, and financial management all increased significantly as major areas for research, especially marketing management and financial management, which increased by about 10% over these two periods. Last but not least, marketing issues have rapidly been gaining a place of central importance in management doctoral research since 1992.

As demonstrated in Figure 2, the design of research through the use of dissertations also reveals notable differences between these two periods. Causal research declined sharply (17%) as a relative proportion of total dissertations, while both descriptive research and exploratory research showed a corresponding gain in the second period.

As shown in Figure 3, research methodology changed significantly, from one period to the next, with greater emphasis being placed on non-empirical

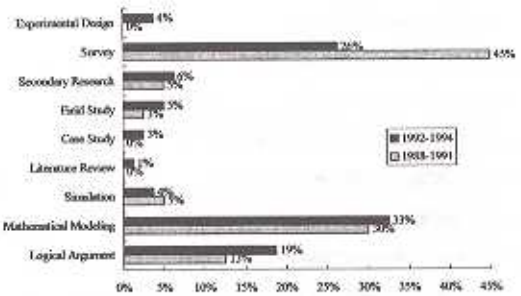

Figure 3. Comparison between 1988–1991 and 1992–1994 distribution of dissertations by research methodology.

analysis. The research methodology employed in dissertations exhibits a decline in terms of the number that relied on the use of surveys and simulation, and a gain in terms of the number of dissertations that focused on the use of logical argument, experimental design, mathematical modeling, and case studies. Experimental design, case study, and literature review were new additions in the second period. Less reliance was placed on surveys, as evidenced by their dramatic decline from 45 to 26%.

Future directions

Having reviewed management doctoral dissertations published in the period from 1988 to 1994 in Taiwan, we have been able to paint an overall picture of the management doctoral degree and its evolution as represented in this paper. To the extent that dissertations reflect the evolution of the field, the trends we have observed do raise some questions about future directions.

Research topics that incorporate practical needs may be urgently required
Research in management focuses on solving complex problems involving organizations in the context of the society of which they form a part. Given this, management research has been considered to be an applied science (Grun 1987; Whitley 1984). According to our study, more dissertations on management are devoted to applied research than to basic or pure research. It seems, however, that there is a tendency to lose sight of the significance of the research topics which are in the interests of practical business. A few examples that require our attention may be mentioned.

During the past two decades, international business operations have become massive in scale and are continuing to expand rapidly. The issues concerned with the operations of multinational corporations and comparisons of managerial phenomena among different countries or regions are critical. However,

in our analysis, only one dissertation dealt with the comparative management that was concerned with cross-cultural similarities and differences in a joint venture.

Consistent with the radical shift in production from upstream industries to capital- and technology-intensive industries in recent years, the government in Taiwan has committed itself to encouraging the private sector to upgrade R&D or technology. The management of research and development, or technology management, has become another function of business.

The government has adopted a policy of reducing the size of the public sector to meet the needs of the Six-year National Development Plan, which it initiated in 1991 to spur the continued development of industry, boost personal income, strengthen the development potential of local industry, balance regional development, and enhance the quality of life in Taiwan. The management of public utilities has attracted a great deal of criticism.

Consequently, in view of their importance, these research topics need to be given greater emphasis. There are less than 10 dissertations in our analysis devoted to these important areas, namely, international business management, comparative management, technology management, and public utility management. These are attributed more to cases than to management orientation. Doctoral candidates may be encouraged to explore further possibilities and flexibly experiment with new topical areas and methodologies. The topics mentioned above remain under-researched and offer special opportunities.

There are grounds for research that is not causal in design

In our analysis, nearly half of the dissertations are causal studies, while less than one-fourth of the dissertations are exploratory studies. In spite of their obvious value, however, researchers and managers alike give the matter of exploration too little attention (Emory and Cooper 1991). Although this finding is in line with that of Zikmund (1991) whereby most basic scientific studies in business ultimately seek to identify cause-and-effect relationships, it still raises some suspicion with regard to the tendency of researchers to be subjectively biased towards substantive approaches, methodologies and research findings (Astley 1984). However, we are not arguing that doctoral researchers adopt approaches which are not rigorous. Our concern is that the methods used are appropriate to answering a research question rather than trivializing the question by imposing inappropriate methodologies. The issue is to combine the pursuit of a significant research question with methods which will give meaningful conclusions.

The causal studies, *per se*, present abstracted and abbreviated specifications of one-way linear relationships between variables in analytical models. As Shrivastava and Mitroff (1984) point out, the search for linear causal rela-

tionships between predefined sets of variables through rigorous operationalization leads to the generation of precise knowledge about a few variables. This emphasis on precision, operationalism, and analysis leads researchers to formulate research questions in such a way that they become amenable to investigation by available research methods. Taking doctoral studies in financial management for example, by using publicly-available data, most of the researchers generate evidence to support the existence of statistically significant relationships between abstracted variables. These studies are elegant and rigorous, but they fail to make explicit the connection between their own results and a host of other environmental or organizational variables that may in practice be closely related. Thus, it might be right in theory, but it is worth little in practice. It seems that a greater appreciation of the substantial differences that exist between research designs can help doctoral researchers select the strategy that is most appropriate to the phenomenon under study and to their own ability and inclination.

The time dimension must be given careful consideration

Cross-sectional studies are carried out once and represent a "snapshot" of one point in time whereas longitudinal studies are repeated over an extended period of time (Emory and Cooper, 1991). In our analysis, about 91% of the dissertations reviewed in this study involve cross-sectional studies, and only 9% involve time-series analysis. It is debatable whether the cross-sectional methodologies that are patterned after research studies in the natural sciences are sufficient for addressing all of the important management issues. Management transpires within a linear time frame as organizations evolve in response to various internal and external forces. In essence, research topics in management are always related to people and the environment, with the most prominent characteristics being dynamism and uncertainty. Longitudinal research differs from cross-sectional research in that multiple data points are observed across time, and thus, the changes that take place over time can be tracked. As Kimberly points out, while problems exist with longitudinal designs (as they do with any design), such techniques provide a richness of empirical findings that would not be possible using a more static design. In Kimberly's own words: "Longitudinal research in and on formal organizations is absolutely essential if we are to develop better theory and models and better strategies for interventions of various kinds" (Kimberly 1976). Indeed, many research questions in management may be answered only after extended observation. Thus, the time dimension is critical to management research settings. Therefore, examples of new approaches, such as action research, phenomenological research, and, future research, are better suited to time dependent phenomena and are highly recommended.

Various arguments can be given as to why management doctoral research in general is characterized by synchronic data and by the diachronic interpretation of such data. The time and budget required along with the other constraints within the doctoral research context mentioned by Smith (1991) do militate against the research methods employed by the doctoral researcher as constituting sound academic research. However, most importantly, the longitudinal strategies hitherto have received little attention from these management graduate schools, despite their potential value to researchers. Forced into a relatively narrow strategy for research, researchers may be less inclined to expend time and effort gaining exposure to, and engaging in, other streams of research.

Interdisciplinary studies should be emphasized

The management dissertations reviewed remain predominantly single discipline based. Only one-tenth of dissertations based their theoretical background on more than one discipline.

The information era has been an era of accelerated change. Apparently, contemporary managers are struggling to address new and diverse challenges – that are cultural social, economic and political, as well as ethical and ecological. Given this, it is highly improbable that attempts to establish a theory of management based on discrete areas of knowledge will succeed. Therefore, business leaders and academics should work toward interdisciplinary integration and cross-area studies in order to increase the range and depth of their knowledge.

As the dissertations in this analysis illustrate, theories imported from a number of disciplines (e.g., economics, psychology, law and mathematics) have been used to underpin research in management. Each perspective does provides a unique set of insights, but there has not been a sufficient degree of success in putting the pieces of the puzzle together. Interdisciplinary research should be one of the primary distinctive features of management as a discipline, and there seems to be sufficient demand for interdisciplinary research within this discipline to make such ventures possible and fruitful. In the same way, students from different disciplines, both multi-disciplinary and interdisciplinary, must be encouraged in doctoral programs to make a synergistic contribution to the state of knowledge.

Conclusion

The doctoral dissertation is the distinguishing feature of Ph.D. training, making substantial demands on both students and faculty; yet we really know relatively little about what it yields. This empirical study offers factual infor-

mation with regard to the dissertation with a view to providing insights into the trends of doctoral research on management in Taiwan. A systematic examination of the topic areas covered by the dissertations has indicated that there is a dearth of information related to the topics of comparative management, international business management, public utilities management, and technology management. Both the doctoral students and faculty advisers are strongly encouraged to look at the innovative possibilities in these topic areas to make the field distinctive.

The distribution of dissertations according to research topics shows more divergence than convergence in the field. The dominant category is financial management which accounts for only 18% of total dissertation researches. The other four topics accounting for a share of more that 10% each are information management, human resources management, general management, and quantitative methods.

Over half of the dissertations (57.5%) were discipline based and 43% were not. Mathematics, psychology, economics, and computer science were the most common disciplines. The coherence of the dissertations with respect to other disciplines is highly correlated with the major of each doctoral candidate's master's degree.

Causal research is the most frequently followed strategy with respect to research design. This finding may be due to the relatively high percentage of dissertations that contribute to the areas of financial management and quantitative methods, and which are characterized by model building and causality testing. As to the research method adopted, surveys and mathematical modeling contribute to the method predominantly used by Ph.D. students, to be followed by logical argument. Secondary research, field study, and other research methods account for the remaining 16%. These findings demonstrate that there may be ways of making the dissertation experience more productive in terms of enhancing research competence.

To the extent that dissertations reflect the evolution of management doctoral education, both educators and doctoral students in management need to direct more efforts to incorporating research topics with urgent practical needs, strengthening research competence, encouraging longitudinal studies, and emphasizing interdisciplinary studies.

Appendix: Framework for analysis of management doctoral dissertations

Variable 1 Year (1988–1994)
Variable 2 Name of University
Variable 3 Author
Variable 4 Title
Variable 5 Topic
1. general management
2. production and operations management
3. marketing management
4. human resources management
5. financial management
6. information management
7. strategic management
8. technology management
9. quantitative methods

Variable 6 Discipline Base
1. single discipline
2. multi-discipline
3. no discipline

Variable 7 Research Design
1. exploratory research
2. descriptive research
3. causal research

Variable 8 Research Methodology
1. logical argument
2. mathematical modeling
3. simulation
4. literature review
5. empirical analysis
6. other

Variable 9 Empirical Analysis Methods
1. case study
2. field study (involving site visits and personal interviews with subjects)
3. secondary research
4. survey (including interviews, self-administered and mailed questionnaires)
5. experimental design (including field experiments, laboratory experiments, and quasi-experiments)

Variable 10 Industry of Empirical Analysis
1. single industry
2. multi-industry
3. no industry
4. non-empirical research

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