Executive Level Masters Programs in Technology Management (TM), Management of Technology (MoT) and Engineering Management (EM)

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Abstract

This paper concentrates on executive level Masters programs (MS) in MoT, TM and EM. Executive level MBA programs were excluded. Programs were selected based on an extensive literature search, searching published directories and a survey of program directors. These searches did not uncover any “official” definition that clearly defined executive as compared to advanced or basic level Masters programs.

An initial screening classified a program as executive if the program required at least five years of business experience and/or the students enrolled had an average age of at least thirty. This resulted in 11 programs. A survey was then sent to the program administrators asking them to rank the criteria that they thought constituted executive or advanced level.

The survey confirmed that an Executive Level Masters program in TM and MoT could be defined by the admission requirement of at least five years of work experience and advanced course work. As a consequence of a 5-yr. minimum work experience requirement, the student body average age would be at least 30 years old. Another criteria is the self-designation of the program as executive, particularly in schools or universities with other “basic” programs.

While all programs required some combination of GRE / GMAT and / or undergraduate GPA, the surveys indicated that this factor did not distinguish basic from advance programs, but was rather a general requirement for all programs. Neither company sponsorship nor engineering or science undergraduate degrees were factors that distinguished advanced or executive level from basic programs. While it is common for EM programs to have engineering and / or science undergraduates, no Engineering Management program made the executive level list.

I. Introduction

Masters programs in the Management of Technology (MoT), Technology Management (TM) and Engineering Management (EM) have been developed over the last decade to bridge the gap between business and technology and to train future technology leaders. These management programs were developed without specific accreditation guidelines and were in response to national studies on competitiveness and industry demands.

II. Literature search

A comprehensive literature search resulted in a wide variety of lists. Articles by D. Kocaoglu (Kocaoglu, 1983, 1984, 1986, 1992), M. Badawy (Badawy 1995, 1998), H. Nystrom (Nystrom, 1999) and P. Hicks (Hicks 1998) provided lists of EM, TM, and MoT programs and schools.

D. Kocaoglu authored a series of papers which list undergraduate and graduate Engineering Management and related programs. M. Badawy authored two papers that provided insight into graduate level Engineering Management and Technology Management programs. H. Nystrom, in his paper, attempts to identify the current programs and courses that are offered by engineering masters level programs. P. Hicks (Hicks, 1998) used the Koontz model to classify various Engineering Management and Technology Management Programs.

The focus of this paper is TM/MoT/EM and not MBA programs although some MBA programs have designated themselves as executive level. These programs are usually in Schools of Business Administration while this paper concentrates on programs in engineering schools. Lists with MBA programs, such as the Techno MBA, were in papers authored by A. Earls (Earls, 1997), J. Maglitta (Maglitta 1995) and R. Weinstein (Weinstein, 1994). Techno-MBAs were concentrated primarily in Information Technology graduate programs.

There were some exceptions to the above. MIT's MS/MoT and NJIT's MS/Mgt. programs have been accredited by the Accrediting Association of Collegiate Schools of Business (AACSB). They were included because these programs are located within schools of management (e.g. Sloan and NJIT) that are affiliated with engineering schools.

In addition, commonly used directories were searched. These included ASEE's Directory of Engineering Graduate Studies and Research; Business Week's Best Executive Education Programs; Peterson's Guide for Graduate Education and the Princeton Review of Graduate Programs in Engineering. (See list of directories at the end of the bibliography.)

III. Need to Define Advanced or Executive Level TM/MoT Programs

These efforts to catalogue engineering and technology management programs did not include a definition or criteria that classified basic and advanced or executive level programs. Thus, there is a need to establish criteria that distinguish between these types of programs.

IV. First Set of Criteria for Executive Level TM/MoT Programs

The lists described in the literature search contained over 50 schools without any designation as to which are basic or advanced. To winnow this list, programs that met two criteria were selected. The first was the entrance requirement of a minimum 5 years work experience and the second was an average student age of at least 30 years. This resulted in eleven programs as summarized in Table 1.

Table 1: List of Executive Level TM/MoT Programs: Schools and Degree Titles

1	Georgia Inst. of Technology	MS/MoT	7	Stevens Inst. of Technology	MTM
2	Lehigh University	MS/MoT	8	University of Denver	MS/M&E
3	Mass. Inst. of Tech.	MS/MoT	9	University of Minnesota	MS/MoT
4	New Jersey Inst. of Tech.	MS/Mgt.	10	University of Pennsylvania	EMTM
5	Pepperdine University	MS/TM	11	Univ. of Washington, Bothell	MMgt
6	Polytechnic University	MS/MoT			

V. Survey Description

The next step was to survey the program directors of the schools identified in Table 1. In addition surveys were sent to three authors of previous studies. The purpose of the survey was to try to establish a consensus among those most knowledgeable of the criteria that distinguish executive level programs.

Table 2 shows the questions asked and the responses. A five point Likert scale was used with 1 = strongly disagree and 5 = strongly agree.

Eight responses out of 14 were received or a 57% response rate was achieved.

VI. Results of Survey of Executive Level Program Directors

Table 2: List of key criteria; Average Response (1= disagree; 5 = agree)

		1	2	3	4	5	Tot	No.	Avg
A	Minimum work experience of at least 5 yrs	-	-	-	2	6	38	8	4.8
B	Average age of at least 30 years	1	2	-	-	5	30	8	3.8
C.	Level of course work (e.g. advanced)	-	-	-	4	4	36	8	4.5
D	Company sponsorship of students	2	-	2	2	-	16	8	2.0
E	Minimum GMAT or GRE scores	-	2	2	4	-	26	8	3.3
F	Undergraduate GPA	-	2	2	4	-	26	8	3.3
G	Engineering or Science undergraduate	3	-	2	2	-	17	7	2.4

The numbers in the table: Cols 1 –5: are respondents who answered that question; Tot: is the total raw score (e.g. $0 \times 1 + 0 \times 2 + 0 \times 3 + 2 \times 4 + 6 \times 5 = 38$), No.: are the number of respondents, Avg.: is the numeral average for that question (e.g. $38 / 8 = 4.8$)

Figure 1 – Average Scores on Survey – In order of Importance

VII. Comments of Survey Respondents

In addition to the above survey results, a number of respondents provided comments. Some noted that the admissions requirement of at least 5 years of business experience produces an average student age of at least thirty. Thus, these two criteria are dependent upon one another and should be considered as one criteria.

A number of respondents noted that many universities and /or the schools designate their programs as executive level. Self-designation usually occurs in universities and schools where there are other programs at basic or undesignated levels. In fact, seven of the eleven programs designated themselves executive level.

A number of respondents also noted that executive programs usually have senior faculty or executives-in-residence, very high participation by the students and employ a practice oriented educational approach.

VIII. Conclusions

The survey results indicate that an Executive Level Masters program in TM and MoT could be defined by the admission requirement of at least five years of work experience and advanced course work. This was based on scores of 4.8/5.0 and 4.5/5.0, respectively.

Based on survey comments it is noted that a 5-yr. minimum work requirement produces a student body average age of at least 30 years old.

The criteria of self-designation came from the respondents' comments. This criteria "fit" most of the programs. In addition, all the schools that self-designate have other programs that are either

VIII. Conclusions – cont.

basic or undesignated. Given the size and scope of these schools and given the size and prominence of the faculty, one would conclude that the self-designation is justified.

While all programs required some combination of GRE / GMAT and / or undergraduate GPA, the survey scores of 3.3/5.0 and 3.3/5.0 indicated that the respondents did not feel that these criteria distinguished basic from advanced programs. Examination of the programs' admissions requirements indicated that GRE/GMAT and GPA are general requirements of all programs.

The survey results of 2.0/5.0 and 2.4/5.0 indicated that neither company sponsorship nor an engineering or science undergraduate degree was used to distinguish advanced or executive level programs. This could explain why no EM program made the executive list. It is common for EM programs to require that a student have an engineering and/or science undergraduate degree for admittance to the program.

IX. Some Observations

Without the discipline imposed by accreditation guidelines and standards it is difficult to assess, with any degree of precision, what are basic and advanced/executive level graduate programs. Despite this lack of “official” standards or criteria, executive level masters programs in TM and MoT have been designated, are well developed and are supported by the industry/customer they serve.

However, a general consensus was achieved on how to designate executive level graduate programs. The major criteria were years of experience and age of students, advanced level courses and self-designation. Other entrance requirements are similar for both executive level and other graduate programs.

X. Future Work

There is also no official standard on what constitutes advanced or executive level courses. A survey of executive level courses compared to other courses in the school, as well as to other programs, would be very helpful to better define this issue.

This is not to say that the programs/schools identified were not qualified to make these judgements. In almost every case the schools and universities involved ran basic as well as advanced courses and were staffed with well qualified faculty that were able to make these distinctions.

Another area of interest would be to explore the role of capstone or integrative courses in executive level programs as well as any other distinguishing educational threads.

Another area would be to determine the degree of student participation and how the degree to which these programs use practice orientated courses compared to general level programs.

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Dr. Donald Merino is a tenured Professor of Technology Management in the Wesley J. Howe School of Technology Management and Professor of Engineering Management in the Charles V. Scheafer, Jr. School of Engineering at Stevens Institute of Technology. He is the founding and current Program Director for the Masters in Technology Management (MTM) Executive level graduate program. He was founder of the undergraduate Bachelor of Engineering in Engineering Management (BEEM) program at Stevens.

He won the Morton Distinguished Teaching Award for full professors at Stevens. Dr. Merino received two Centennial certificates from the ASEE in Engineering Economics and Engineering Management. The American Society of Engineering Management (ASEM) awarded a Fellow and the Bernard Sarchet award. He is past Chair of the Engineering Management Division and Engineering Economy Division of ASEE. He is past President of ASEM and currently serves on the ASEM board as an At Large Director.

Dr. Merino has 25 years of industrial experience in positions of increasing managerial responsibilities. Since joining academe 16 years ago, he published 22 refereed journal articles and conference papers and over 50 technical research reports in Engineering Economics, Design for Cost, Concurrent Engineering and TM/MoT/EM areas.

His book, "The Selection Process for Capital Projects", (engineering economics and decision analysis) is published by John Wiley and Sons in their Engineering and Technology Management series. He teaches undergraduate and graduate in Engineering Economics, Total Quality / Process Management, Strategic Business Management, Decision Analysis and Concurrent Engineering.