

Developments In Business Simulation & Experiential Exercises, Volume 21, 1994

CLUSTER ANALYSES OF AMERICAN UNIVERSITIES' BUSINESS CORE CURRICULA STRUCTURES UTILIZED TO SATISFY FIFTEEN CURRICULUM AREAS

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ABSTRACT

This research reports findings from cluster analysis of data from a national survey of schools and universities offering a four-year business major curricula. Responses from 107 American higher-education institutions composed of the largest American schools to the smallest were studied to gain insights as to how course fields were utilized, i.e., percentage of curriculum area coverage provided by a particular course field, to satisfy fifteen suggested curricula areas.

Finding of the study include: seven of the fifteen areas cluster pedagogy structures explained 40 percent or more of the variation within the cluster structure, with another area almost 40 percent (39.99%); seven area pedagogy structures have a few directly related course fields explaining a large percentage of the cluster variation. Thus, it appears that approximately half of the curriculum area pedagogy structures are to a major extent covered by a single course field, one specific to that curriculum area, with minor amounts of the topic covered in various secondary courses. Therefore, curriculum design appears to be influenced by additional factors of a non-pedagogical nature curriculum design decisions. e.g., faculty resources, size of institution, historical emphasis of the school among the arts and sciences, etc. Also evidence is provided indicating that curriculum design may be affected by the ambiguity level of the curriculum area.

INTRODUCTION

Course design and development within the School of Business at the University of Tennessee at Martin is usually accomplished at the grassroots level -- i.e., by individual professors proposing, developing and modifying courses. These changes may or may not be reviewed by peers within the discipline. However, before they are adopted approval is required from two undergraduate curriculum committees, and from university administration through the level of the Chancellor.

Conceptually, the material content of a course should be conjoined with that of other courses in such a manner that a logical and progressive education experience is provided. Each course should be built upon the base provided by previous courses, and should, in turn, enhance that base for successive courses. It should have an assigned "role" in developing - or contributing to the development of -- a particular body of knowledge in the intellectual growth of the individual.

In the experience of the authors, who have served on various curriculum committees over the years, course reviews sometimes fail to take a holistic view of the curriculum, and of the role a particular course will play in that curriculum. If this condition exists in other universities as well, one might argue that a new emphasis should be placed on the importance of curriculum design, and that a more deliberative process be employed.

To this end, a starting point - and probably the best one -- for inferences regarding curriculum design philosophies in American colleges and universities is a determination of the roles that various courses are assigned in traditional business curriculum areas. The research reported here is an initial investigation in this direction.

REVIEW OF THE LITERATURES

There is not a great deal of literature regarding collegiate business curriculum design/development in general, although there is literature reflecting design considerations or issues in specific courses or course areas. A computer search was conducted utilizing ERIC 1982-June 1993, the ABI/INFORM 1987-July 1993, and ABI/INFORM GLOBAL January 1990 to July 1993 utilizing various combinations of the following identifiers: curriculum, development, design, higher, education, business, required, courses, and AACSB. One search yielded 39 "hits," of which six appeared relevant and were reviewed; another search yielded seven "hits," of which one was reviewed. None of the seven focused on "core" curriculum, or how the "core" was being met by schools of business administration; five were course-specific reports having various emphases. The third database provided no additional citations.

The benchmark report on college business curriculum is that of Porter and McKibbin (Porter, 1988). They argued that more attention needed to be paid curricula used to educate students, and that strategic planning was essential. Evangelauf reports that, "the report says too many business schools have a 'cookie-cutter mentality' and are too homogeneous" (Evangelauf, 1988).

The remaining articles focused on specific curricula areas such as accounting (Nix, 1986), communications (Johnson, 1983), international (Smuckler, 1989) or discussed new areas of curricula needs like environmental concerns (Ahna, 1992) and computer usage (Shufeldt, 1992).

OBJECTIVES OF THE RESEARCH

The purpose of the research described here was to develop an understanding of how the "core" courses required in the programs of four-year colleges and universities offering a business major were used to cover fifteen traditional business curriculum areas. Specifically, we wished to know what courses fields were used to cover each area. To this end, profiles were constructed through determination of commonalities within required course curricula of the respondents.

STUDY POPULATION AND SURVEY METHOD

From a sampling frame of 1 329 schools having four-year baccalaureate programs in business and/or economics listed in *Peterson's Guide to Four-Year Colleges, 1997*, (Peterson's Guide, 1991) a random sample of 556 subjects was drawn. The deans or division heads of the business units were contacted by mail and requested to complete and return an enclosed questionnaire, or to forward the questionnaire to an appropriate individual for completion.

A total of 1 27 questionnaires were returned -- 73 from AACSB member schools (38 accredited institutions and 35 non-accredited) and 54 from nonmember schools, giving a return rate of 22.8 (127/556) percent. Table 1 presents a profile of respondents by majors offered, tabulated by size of university.

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Table 1
PROFILE OF RESPONDENTS
 (Number of Respondents Reporting Majors, by Size of University)

Size of University (Total Enrollment)	(N) n	Acct. (n)	Ad Serv. (n)	Econ. (n)	Fin. (n)	Gen'l Mgmt. (n)	Funct'l Mgmt. * (n)	Mark't. (n)	MIC (n)	Quant./Mgt. Sci. (n)	Gen'l bus. (n)	Int'l Bus. (n)	All Other* * (n)
0 - 4999	(357) 74	67	10	27	32	62	7	43	30	5	19	6	29
5000 - 9999	(82) 21	21	6	14	19	19	4	19	10		8	3	12
10000 - 14999	(45) 8	8	3	6	8	8	2	8	5		2		6
15000 - 15999	(29) 9	9	2	3	8	8	2	8	5		2		
20000 - 24999	(18) 7	7		4	5	7	1	6	2	4	2	1	3
25000 - 29999	(12) 5	5		4	5	5		5	4	1	2	1	2
30000 - 34999	(7) 1	1			1	1		1	1	1		1	1
35000 - 39000	(2) 2	2		2	1	2		1	1		1		1
Over 40000	(4) 0												
Pct. Of respondents with majors	100.0 %	94.5%	16.5%	48.2%	62.2%	88.2%	10.2%	71.7%	46.5%	10.2%	27.6%	9.6%	43.3%
Average school enrollment by Major		238	98	53	186	237	49	196	119	72	340	137	312

Notes:

- * Functional Management includes such majors as Production, personnel/Human Resources, etc.
- * All Other includes graduate program as well as such majors as Health Care Administration and Motel Management.

Sixty-four of the 127 respondents were private schools (N = 336; return rate = 19.0 percent) and 63 were from public (N=220; return rate = 28.6 percent). Seven of the private schools were AACSB accredited, 14 were AACSB members, and 43 were non-members; 31 of the public schools were AACSB accredited, 21 were AACSB members, and 11 were nonmember. The number of majors offered by the 127 institutions varied from one to eleven. During a careful review of the 127 questionnaires, twenty of the responses were dropped from the study population, leaving 107 responses.

DEFINITIONS

For the purpose of coding the data for analyses, the following set of definitions were developed:

course field: a group of courses possessing a commonality of pedagogy content within a given curriculum field or discipline.

curriculum area structure: a set of course fields used to provide coverage of a specific curriculum area.

cluster structure: a group of course fields structured into a statistical cluster.

METHOD OF ANALYSIS

Respondents provided various items of bio-data, and listed their required core courses in the left column of a table which had fifteen traditional

business curriculum course areas across the top. The curriculum areas are: production, marketing, finance, economics legal environment, ethics, social/political, accounting, quantitative methods. MIS, organizational theory, organizational behavior, interpersonal communications, administrative processes, and international. They then completed the table by allocating the percentage contribution that each course made to the total coverage of each curriculum area. Thus there was established a relationship between their respective "core business curriculum" courses and curriculum areas.

Our purpose was to find similarities within the absolute percentage contribution value of utilization of a particular course field relative to a specific curriculum area pedagogy structure (Sheeley. 1984). This resulted in the creation of each curriculum area's pedagogy for each respondent. Cluster analysis was chosen as the method to group pedagogy structures according to similarity of utilization in providing coverage for each of the 15 curriculum pedagogy areas because of its ability to maximize likenesses within groups and also maximize differences among groups (Zikmund. 1984).

Using researcher designed criterion for the percentage variation explained by each cluster. Statistical Analysis System (SAS) procedure VARCLUS was used to search for the best fit (Ray. 1984). The design criterion used required that each cluster component must provide at least a 30 percent variation explanation for a new cluster to be formed. The model also was designed to allow the second eigenvalue a maximum value of zero for each cluster.

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FINDINGS OF THE STUDY

Cluster analysis of 15 suggested curriculum areas were conducted independently for each area. Following is an analysis of the course fields utilized to provide coverage of the curriculum areas. Three cluster orders were found within the fifteen curriculum areas. These cluster orders indicate that curriculum diversity is probably related to the ambiguity of the curriculum area. This based on the observation that within six more traditional curriculum areas, little curriculum diversity is found with only two clusters being formed. Additionally, five moderately ambiguous curriculum areas formed greater curriculum diversity with three clusters being formed. The four-curriculum area with the greatest ambiguities formed the largest curriculum diversity with the formation of four cluster structures.

The group of six curriculum areas with little diversity is composed of Production (37.35), Economics (49.93), Legal Environment (35.13), Finance (34.83), Accounting (45.52), and Communications (30.50).

Production The first cluster (40.5) indicated that curriculums tend to relate production to accounting (78.38) and marketing (74.42). The second cluster (33.58) indicates that Production / Operations Management (95.03) is a primary course utilized to cover the production field of knowledge.

Economics Cluster one (45.21) shows that Principles of Economics (95.48) is the primary course used to cover the field. Cluster two (49.93) indicates that Economics is frequently related to Strategy / Policy (83.31) or Other Business Concepts (84.59).

Legal Environment The first cluster (33.38) is a mixture of management (71.40), marketing (65.88) and Strategy / Policy (56.85) to cover the field of knowledge. Cluster two (35.13) shows that Law (60.17) and that Legal Environment (37.70) are utilized to cover the field.

Finance The first cluster (36.79) indicates that Corporate Finance (92.83) and Other Finance Concepts (86.75) are the two primary course used to cover Finance. Cluster two (34.83) clearly shows that Accounting courses (78.61) and MIS (80.01) are used to cover the field of Finance.

Accounting The first cluster (33.66) indicates that closely related fields: Finance (38.03), MIS (71.36), Law (76.37) are frequently used to cover the total field of Accounting and its relevance to organizational operations. Cluster two (65.24) shows that Accounting Principles (94.67) and Other Accounting courses (87.88) are the primary courses used to cover the knowledge of the field.

Interpersonal Communications This curriculum area shows prima facie evidence a totally nonsensical curriculum area structure is present in this area of knowledge. In cluster one (30.95) is explained primarily by Accounting (82.29) and MIS (86.79). Cluster two (30.50) is mainly explained by Economics (69.84) and Legal/Law (79.31)

The group of six curriculum areas with moderate curriculum diversity is composed of Marketing (48.70), Organizational Theory (43.91), Organizational Behavior (46.96) and International (36.45).

Marketing Cluster one (46.31) shows that either Marketing Principles (84.26) or Other Marketing courses (85.47) are one means used to cover Marketing. Cluster two (75.31) indicates that Marketing is related to organizational management and behavior (75.31) as well as Strategy/Policy (75.31). The third cluster (48.70) shows that marketing is covered out of the department (76.01) or is not covered in the core (42.83).

Management Information Systems Cluster one (34.32) shows that a Computer Programming course (70.24) is still considered by some to be a relevant course within the field of knowledge. Cluster two (40.10) indicates that MIS (70.44) and Other Computer Concept courses (70.44) are critical to MIS curriculum coverage of the field. Cluster three (51.17) indicates that some courses are utilized to cover related utilization of MIS with organizational operations through Accounting (74.24) and Strategy / Policy (74.92).

Organizational Theory Within cluster one (40.88), Management (80.62) Organizational Concepts (77.22) carry considerable coverage of the field. Cluster two (25.47) indicate that Business Principles (35.13) and Law (35.20) do not provide much coverage of the field. Cluster three (57.23) indicates a potential curriculum concern in that the knowledge is offered late in the curriculum with Strategy / Policy and equally not required in the core (57.23).

Organizational Behavior Cluster one- (54.81) shows that Behavior (81.07) and Management (82.77) courses perform a focal role in covering the O.B. field of knowledge. Cluster two (33.62) and three- (61.86) indicate that a cadre of courses are utilized to explain the field of OB. within an organizational context.

International Cluster one (30.38) indicates that there is an integrated set of business function courses used to cover the field of knowledge. Cluster two (36.42) shows a broader perspective of the international field through Business Principles (54.74) and Social/Legal Environment (57.68) courses. Cluster three (60.79) is a nonsensical cluster composed equally of Communications and Other Business (60.79) courses.

The group of four curriculum areas with considerable curriculum diversity is composed of Ethics (39.28), Social and Political (40.65), Quantitative Methods (41.40), and Administrative Processes (42.12).

Ethics The first cluster (40.03) indicated that ethics is frequently covered in elementary courses: Finance (61.54), Business Principles (59.99). The second cluster (30.28) is similar to cluster one in that Accounting (50.90) and Economics (58.31) and MIS (48.44) are frequently used to cover the field. Cluster three- (67.38) show that Legal / Law (67.38) and out of department courses (67.38) are equally used to cover the field. The fourth cluster (37.28) indicates that Ethics is frequently not required in the core (49.30).

Social and Political The first cluster (33.21) indicates that the field of social and political environments is frequently not required in the core (57.74) and is seldom covered by a social environment course (1.59). Cluster two (91.47) shows that Other Business courses and Communications equally (97.47) are frequently used to cover the field of knowledge. The third cluster (31.82) indicates that the common courses of Economics (21.06), Accounting (40.70), and out of department courses (40.67) which were suspected to be Economics taught by the social science department, were expected to include coverage of the field. Cluster four (33.83) indicate that Business Principles (62.95) and Marketing (56.42) are taught, then the courses are expected to provide a relevant coverage of the field.

Quantitative Methods Cluster one (41.58) indicates that semantics may be a problem within some curriculums. Accounting (69.31) and Finance (62.92) are the focal courses of this cluster. Cluster two (35.61) indicates that Statistics (77.56) and Quantitative Methods (51.47) are frequently utilized to cover knowledge of the field. Within cluster three (57.95) Business Principles and Business Math (57.95) are equally infrequently used to cover the knowledge of the field. Cluster four (41.40) shows that MIS (34.42), Management (55.95) and Marketing (23.40) are also infrequently used to cover the knowledge of the field.

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by Economics (64.37), and Other Business Concepts (62.97). Cluster two (34.24) is explained mostly by Management (68.92) or is not-required-in-the-core (60.75). Cluster three is based on Business Principles (45.92), and Legal/Law (45.24). Cluster four (100.00) is composed only of Communications (100.00).

SUMMARY OF THE FINDINGS

For the fifteen area pedagogy structures studied, none of the cluster pedagogy structures explained 50 percent or more of the variation within a curriculum area. However, in seven of the fifteen areas (Marketing, Economics, Social and Political Environments, Accounting, Quantitative Methods, MIS, Organizational Behavior, and Administrative Processes), the cluster pedagogy structures explained large percentages (40 percent or more) of the total variation within the cluster structure, with another area almost 40 percent (39.99%). Therefore, curriculum design appears to be influenced by additional factors of a non-pedagogical nature (e.g., faculty resources, size of institution, historical emphasis of the school among the arts and sciences, etc.) curriculum design decisions.

Also, seven area pedagogy structures -- production, marketing, finance, economics, accounting, management information systems organization theory, and organizational behavior -- have a few directly related course fields explaining a large percentage of the cluster variation. Thus, it appears that approximately half of the curriculum area pedagogy structures are to a major extent covered by a single course field, one specific to that curriculum area, with minor amounts of the topic covered in various secondary courses.

In the opposite direction, it also appears that some curriculum areas (notably Ethics, Social and Political Influences, and Quantitative Methods) are handled in a number of different ways -- either by a mosaic of courses that collectively meet the coverage needs for the area, or by out-of-department service courses. This may either be because these areas have a less clearly defined pedagogy and course/area content, schools do not have adequate resources to treat them with individual courses, or there are inadequate program hours available for another required course. In any event, it would seem critical to monitor the content of the courses used to cover these areas to assure that each of the contributors continue to meet its expected role even as texts, instructors, etc. change over time.

Two additional points are noteworthy. The first of these is the patterns of instruction for serving the MIS curriculum area -- specifically, the prominence of "computer programming" and "computer concepts" in explaining the in-cluster variance of their respective pedagogy area clusters. The use of "Computer concepts" courses (e.g., Introduction to Data Processing, Computer Systems, etc.) explained almost as much variance in cluster two as did dedicated MIS courses. It is particularly essential in these instances that the content/role of the course(s) serving the mission of providing MIS instruction be monitored to assure that they actually accomplish their intended role.

The second point is the relatively weak showing of the Strategy/Policy course in meeting instructional needs in the area of Administrative Processes. In comparison to the showing of Principles of Economics courses in meeting the needs for economics instruction (95.48% variation explained, Cluster 1), or Corporate Finance for finance instruction (92.83% variation explained, Cluster 1), or Production/Operations Management for POM instruction (95.03% variation explained, Cluster 2), the Strategy/Policy course explained only 28.70 percent of the variation among the instructional methods of Cluster 3. On an anecdotal level, however, this is consistent with comments noted on returned questionnaires, in which respondents

NEED FOR FURTHER RESEARCH

Further research needs to be conducted to determine the effect that bio-data might play in the way that the course fields are structured. These include: school size, AACSB accreditation level, number of majors offered within the school, source of funding, number of students enrolled in each major field, and the existence of graduate programs. These variables would be expected to impact course offerings as well as the need for the school to rely on out-of-department service courses. For example, smaller schools might well have to rely on out-of-department service courses in such areas as communications, computer science, ethics, or social and political influences, while larger schools, having more resources, could offer these courses within their own school.

Another area for further research is a continuing effort to determine the role that course fields are intended to play in providing a comprehensive baccalaureate level business education. Based on the study reported here, it appears that certain curriculum areas are critical instructional areas, at least as might be indicated by the frequency with which they are served by a single course -- e.g., Principles of Accounting, Principles of Marketing; Production/Operations Management; Corporate Finance. If this is true, these courses appear to have a particular role to play in curriculum design. Care should be taken to assure the integrity of the course and its mission, regardless of the textbook chosen for the course; the role of the course should not be affected by the particular emphasis of textbook(s) chosen for the course. Therefore, research should be conducted to examine the appropriateness of various textbooks to the roles assigned critical courses within the school's curriculum design.

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