

A PROFILE OF COLLEGES AND UNIVERSITIES THAT HAVE ADOPTED THE DATA PROCESSING MANAGEMENT ASSOCIATION'S MODEL CURRICULUM

by **Kenneth T. Fougere, Ph.D.**
Bryant College
Smithfield, RI 02917

ABSTRACT: The Data Processing Management Association (DPMA) developed a model curriculum for the education of business computer students in 1981. One element of this curriculum was directed toward four-year colleges and universities. Since that time, hundreds of colleges and universities have adopted this model for use in their computer program. Because the DPMA will be issuing updates to this curriculum as an on-going process, some knowledge about the types of institutions that have adopted the model curriculum may be helpful in insuring that new changes are accepted. Research in the adopting of innovations, such as a curriculum, for example, has shown that the more you know about a potential adopter, the better able you are to develop strategies for adoption of your product. A survey of adopting institutions was used to form a profile of adopting institutions. The results are presented in this study.

KEYWORDS: Model Curriculum, Data Processing Management Association (DPMA), Computer Information Systems (CIS), American Assembly of Collegiate Schools of Business (AACSB).

INTRODUCTION

A recent survey of educational institutions that have adopted the Data Processing Management Association's Model Curriculum has been completed. [1] There were two main reasons for the study. The first reason was that no studies to date have attempted to characterize the adopting institutions and their Computer Information Systems Departments. The second reason was that no studies to date have attempted to relate institutional and department data to the concerns that CIS faculty members have about the model curriculum in order to better understand what factors influence these concerns.

Two questionnaires were used in the study. The first, sent to CIS faculty members in institutions reported to have adopted the model curriculum, measured their degree

of concern on the seven hypothesized Stages of Concern that individuals move through as they become more familiar and adept in the use of an innovation. [4] This survey instrument was developed by Gene Hall and others at the University of Texas at Austin. The second survey instrument, developed by the researcher and sent to CIS department chairs, was designed to collect department and institutional data that were thought to relate to faculty concerns about their use of the model curriculum.

It was determined that a total of 328 four-year colleges and universities in the United States were reported to have adopted the model curriculum since its release in 1981. [3] Six faculty questionnaires and one department chair questionnaire were sent to each adopting institution. Of the institutions surveyed, 86 provided

complete responses representing 26.2% of the total. Each CIS department chair and an average of 3.1 CIS faculty responded per institution.

This article will present the findings obtained from the department and institutional data collected. A series of charts and crosstabulation tables will present data that will help to characterize the adopting institutions and their CIS departments.

PROFILE ONE

The first section of the findings profiles the adopting institutions and their CIS departments. Charts 1 through 4 show curriculum adoption and implementation information. In Charts 5 through 7, institutional and CIS faculty size information is presented. Charts 8 and 9

show membership data regarding the American Assembly of Collegiate Schools of Business (AACSB) and the Data Processing Management Association (DPMA). Lastly, in Charts 10 and 11, the average years of college teaching and average semesters of experience using the model curriculum is shown.

The information presented in chart 1 reveals that the printed word (Journals/Newspapers) and business gatherings (Conference/Meetings) were the major sources of information about the model curriculum. Other sources of information were from college staff, from CIS personnel who participated in the development of the model curriculum, and from miscellaneous sources such as computer vendors. These results should be of interest to the DPMA for developing strategies for effective communications about the model curriculum's existence to potential adopters, as well as informing existing adopters about curriculum updates to the model.

As illustrated in chart 2, almost half of the institutions responding to the survey adopted the model in its first year of release, a possible indication that this innovation had been eagerly awaited by the educational CIS community. In more recent years, it is observed that there has been a significant decline in the number of adopting institutions. There are still hundreds of potential adopters in the educational community that should be made aware of the existence and benefits of the model curriculum.

Chart 3 illustrates that the method of adoption was heavily influenced by faculty with the department faculty being the most influential in the adoption decision in 57% of all adopting institutions responding to the survey. Other than this category and the category of department chairs' influence, there is very little influence from the remaining sources.

The CIS professionals (both chair and faculty) in the adopting institutions were instrumental in the adoption of the model curriculum in 87% of the cases. This high

Chart 1. Source of Adoption Information

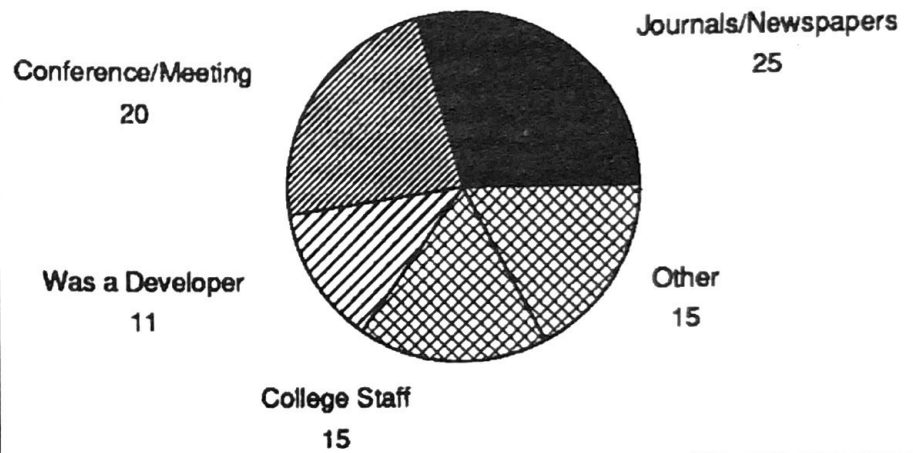


Chart 2. Year of Curriculum Adoption

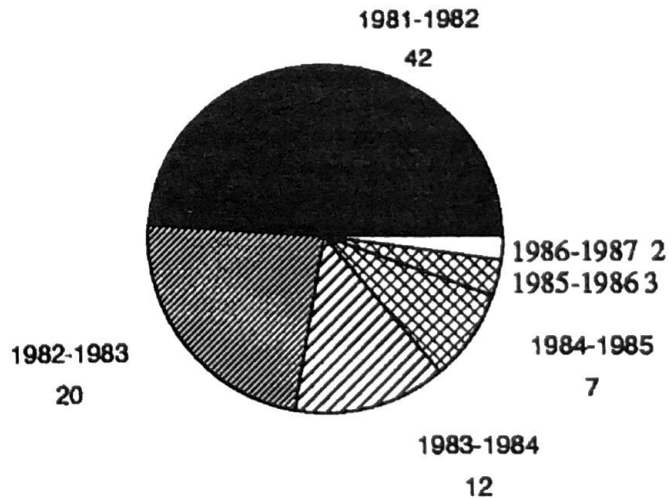


Chart 3. Most Influential in Adoption Decision

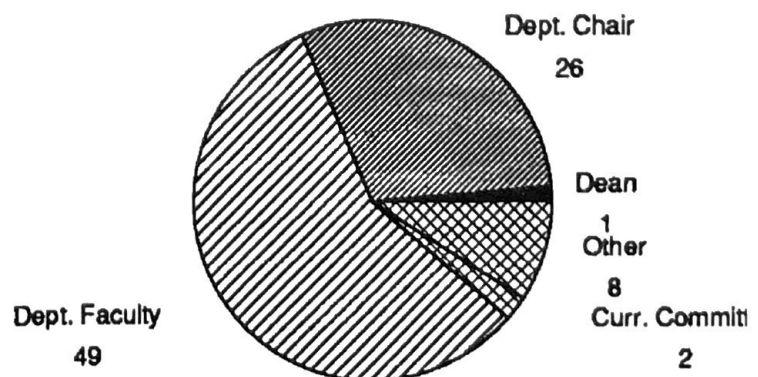
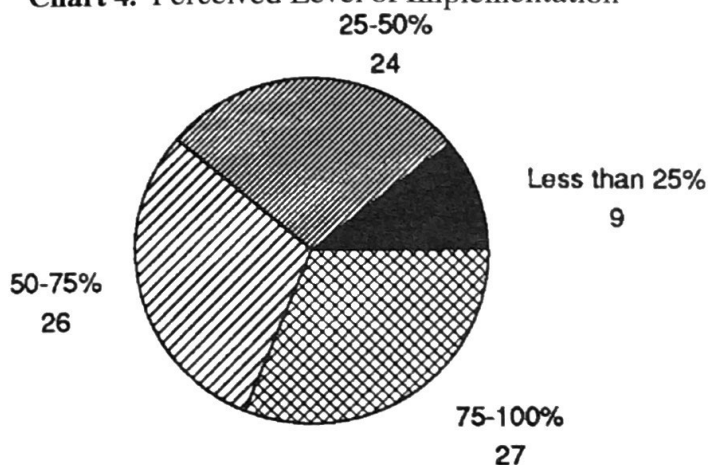


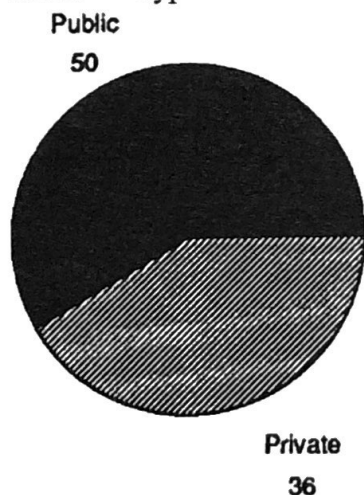
Chart 4. Perceived Level of Implementation



percentage is encouraging in that these individuals are in the best position to understand and determine appropriate CIS courses for their students.

Chart 4 shows that the perceived level of implementation as viewed by CIS department chairs was high with only 10% of all chairs surveyed stating that their institutions had implemented less than 25% of the model curriculum. The percentages of institutions in the three higher categories of 25-50%, 50-75%, and 75-100% were fairly evenly distributed. However, about 62% of adopting institutions were perceived as having implemented 50%-100% of the model curriculum.

Chart 5. Type of Institution



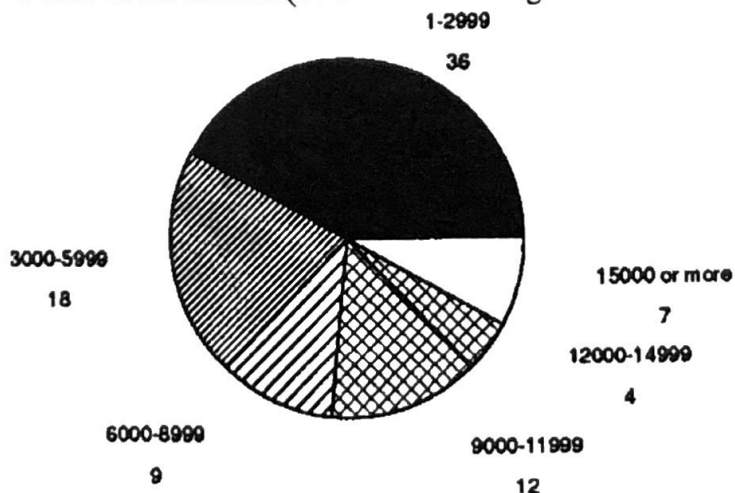
These percentages suggest that once the model curriculum has been adopted, the implementation of the individual courses in the curriculum moves along at a satisfactory pace given the relatively short period of time since the model's release.

In Charts 5 through 7 institutional and faculty information is presented.

As illustrated in chart 5, more public than private institutions responded to the survey. The percentages indicate that roughly three out of every five institutions are public. A number of questions can be raised about this unequal balance. Is there a more "computer science" orientation to the computer curriculum in private, as opposed to public, colleges and universities? Have many private institutions adopted the Association for Computing Machinery's (ACM) business computer curriculum instead of the DPMA's? Do many private institutions prefer their own "in-house" computer curriculum to the DPMA's? These questions and many others can be uncovered by further research in this area.

Chart 6 shows that most responding institutions were small in size with 42% under 3000 students and 63% under 6000 students. Only 8% of the institutions had 15000 or more students. Again, the question is raised about possible inherent differences in the type of computer

Chart 6. Size of Institution (Full-Time Undergraduate Students)



curriculum by different classifications of colleges and universities, this time as regards the size of the institution.

As chart 7 illustrates, institutions with a small number of full-time undergraduate CIS faculty were in the majority with 36% of these institutions containing fewer than 7 CIS faculty members and 67% of the institutions containing fewer than 13 CIS faculty members. Only 15% of the institutions had more than 18 CIS faculty members.

Other than possible inherent differences in computer curricula in institutions with different size CIS faculty, there is also the possibility that the adoption process of innovations moves more quickly when a smaller number of individuals are affected, as would be the case with a smaller number of CIS faculty. An analogy would be that of trying to obtain a consensus on an issue with a small committee as opposed to a large one.

Chart 8 illustrates that a number of adopting institutions (27%) are fully accredited by the American Association of Collegiate Schools of Business (AACSB). Some adopting institutions (30%) are only members, either in the process of becoming accredited or merely on the AACSB mailing list. The majority of the institutions (43%) were not associated with the AACSB in any way.

The AACSB is the sole accrediting agency for baccalaureate and masters degree programs in business administration. Developers of the model curriculum feel that their model offers a strong academic program along with the necessary computer courses for entry-level job requirements. It is encouraging to note that a number of AACSB accredited and potentially accredited institutions feel that the DPMA Model Curriculum has a satisfactory business component, in addition to their CIS component.

Chart 9 also depicts information about membership in an organization, specifically DPMA. Department chairs were members of the DPMA in slightly

Chart 7. Size of Faculty (Full-Time CIS Department Faculty)

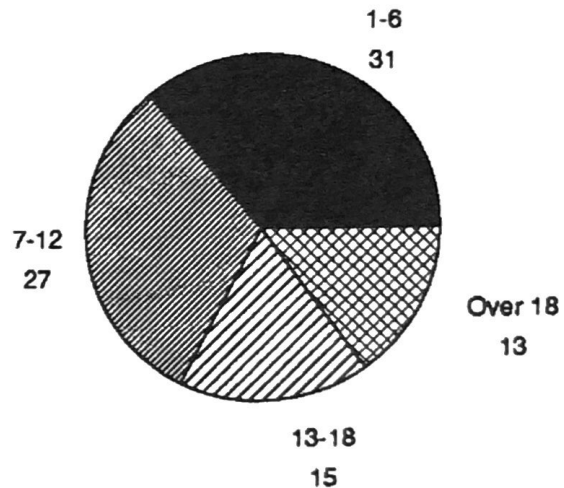


Chart 8. AACSB Affiliation

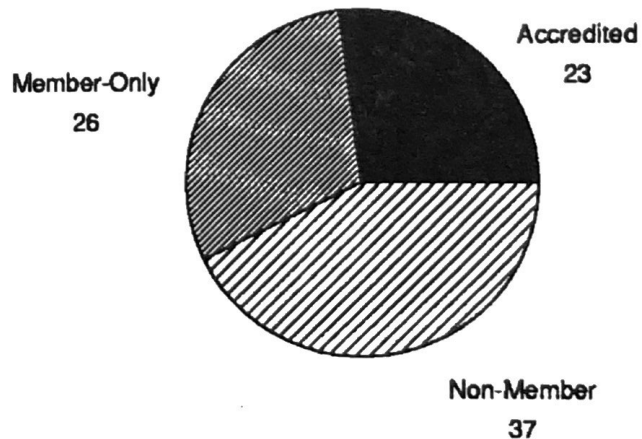
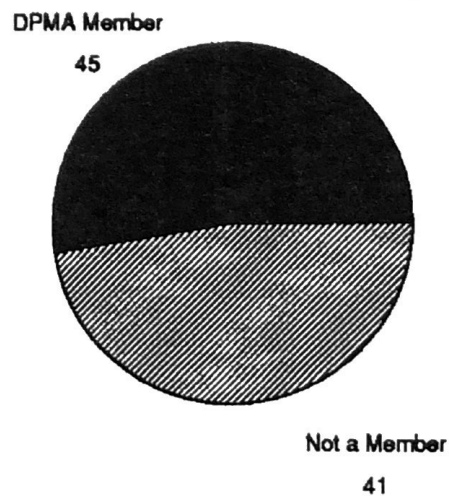


Chart 9. DPMA Membership



more institutions than were not. Department chairs were DPMA members in 52.3% of institutions that adopted the DPMA Model Curriculum and were not DPMA members in 47.7% of adopting institutions. These figures suggest the possibility of a recruitment program to bring more CIS chairs into the DPMA organization. CIS chairs as members of the DPMA would certainly be in a more knowledgeable position, by virtue of their attendance at meetings and conferences as well as a more ready access to DPMA publications, to bring forth to their institution the latest information concerning CIS curriculum developments.

One suggested strategy would be to work through local DPMA chapters as a way to attract CIS department chairs to DPMA meetings as an initial step in involving them in the organization. This could be done simply by inviting them to a meeting and picking up the tab for their dinner, or asking them to consider being a guest speaker on a particular topic.

Two variables obtained from faculty questionnaires were Years Teaching at the College Level and Semesters of Experience with the Model. These variables were averaged for each institution and categorized as shown in Charts 10 and 11.

The vast majority of CIS departments averaged fewer than 16 years of college teaching (85%) indicating that the CIS computer education field is a relatively young discipline. Only 15% of CIS department faculty averaged more than 15 years of college teaching and just 2% averaged over 20 years. Realizing that the model curriculum was first released in 1981, there were a number of years that CIS faculty operated without a comprehensive educational plan for the education of their CIS students. It is obvious, as judged by its initial acceptance by educational institutions, that the development of such a curriculum was needed.

The average semesters of experience with the model curriculum of CIS faculty in

Chart 10. Institutional Average of Years of College Teaching

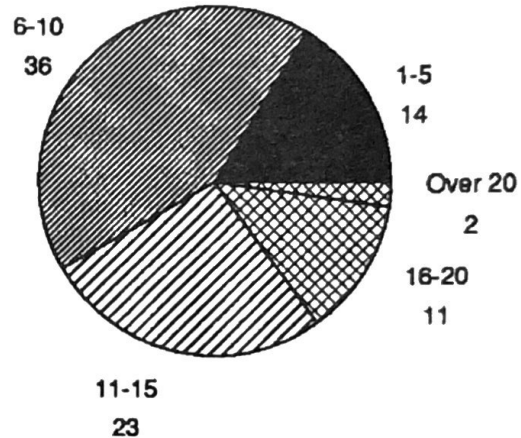
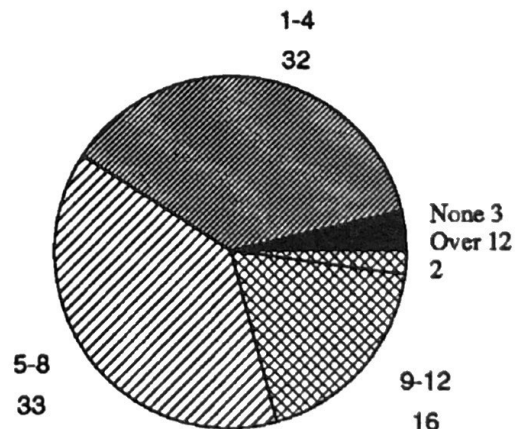


Chart 11. Institutional Average of Semesters of Experience



these institutions reflected the newness of the DPMA Model Curriculum. About 79% of the institutions reported their average semesters of experience with the model at less than 9 semesters.

As educators become more familiar with the full range of courses in the model curriculum there will be more suggestions forthcoming for enhancements to the model. These changes can be brought about by critical

evaluations of content material or result directly from changing technology and the way we do business.

The vast majority of CIS departments averaged fewer than 16 years of college teaching (85%) indicating that the CIS computer education field is a relatively young discipline.

PROFILE TWO

The second section of the findings paired each of the individual variables presented in profile one with each other in order to further characterize the adopting institutions and their CIS departments.

Crosstabulations as well as Chi-Square analysis of the significance of these

relationships were performed on the data. Chi-Square analyses was used to test the null hypothesis at the 5% level of significance that there is no relationship between these independent variables when compared one to the other.

There were a total of 55 Crosstabulation and Chi-Square tests initially run on the categorical data collected from the survey responses. The null hypothesis was accepted in all but three cases. In other words, only three crosstabulation results showed significant differences between actual and expected counts in their individual cells. However, nine other crosstabulation results showed significant differences as well but the results were nullified by too few counts in many of their cells. As a result of these nine results having expected counts of less than five in more than 20% of their cells, the levels of these variables were collapsed to form fewer cells and additional Crosstabulations and Chi-Square tests were run. Cochran (cited in Conover) [2] states that this cell count problem could invalidate the results of Chi-Square tests. From this second run there were five additional significant findings. Four of the nine tests still showed a cell count problem.

The first part of this section presents the findings from the analysis of the uncollapsed data. These findings are presented in Tables 1-3. The second part of this section presents the findings from the analysis of the collapsed data. These findings are presented in Tables 4-8

Please refer to table 1 which depicts the source of adoption information by DPMA membership. When the institution first learned of the existence of the model curriculum from those who had attended a conference or meeting, or from those who were involved in some aspect of the model's development, most CIS department chairs in those institutions were DPMA members. The department chair, when a member of the DPMA, could have been functioning as an opinion leader in many of those instances where the model curriculum was adopted. An

Table 1. Source of Adoption Information by DPMA Membership

Category	DPMA Member	Not a Member	Total
Journ/Newspapers	12	13	25
Conf/Meeting	15	5	20
Was a Developer	9	2	11
College Staff	2	13	15
Other	7	8	15
Total	45	41	86

Chi-Square = 17.480 DF = 4 P < 0.002

Table 2. Type of Institution by CIS Faculty Size

Category	1-6	7-12	13-18	Over 18	Total
Public	13	21	8	8	50
Private	18	6	7	5	36
Total	31	27	15	13	86

Chi-Square = 7.827 DF = 3 P < 0.050

opinion leader is one who earns respect because of technical competence, social accessibility, or conformity to the norms of the system. The adoption of an innovation is positively related to the efforts of opinion leaders. [5] As members of the DPMA, department chairs are in a position to have detailed knowledge about the model curriculum and can evaluate the appropriateness of it for their institution. Thus, if department chairs felt the model curriculum was appropriate for their institution, they would be in a powerful position to influence its adoption.

When the source of adoption information was from journals or newspapers, the department chairs were evenly split between DPMA membership and non-DPMA membership. This finding is an indication that this method of

communication about an innovation reaches a wide variety of readers and not just the leadership in a particular group. This result could mean that there are many types of printed materials available that could bring news of the development of an innovation to potential users.

When the source of information about the existence of the model curriculum came from the informal "other" category, the DPMA membership of the department chair was also evenly split between member and non-member. Mostly, this method of communication was by word-of-mouth from various sources indicating the likelihood of this method of communication having an equal chance of reaching all interested parties including CIS department chairs.

However, when the source of adoption information came from the college staff, a significantly greater number of department chairs were not DPMA members as opposed to those who were. This result may indicate one or more members among the college faculty functioned in the role of an opinion leader, being instrumental in the adoption of the model curriculum by their institution.

The second group of results dealt with whether the institution was public or private and its relationship to the size of the CIS faculty in those institutions. Please refer to table 2 for the detailed data. The important result involved institutions with 1-6 faculty members and institutions with 7-12 faculty members. There exists a greater number of small-sized faculty (1-6) in private institutions than in public ones as well as a greater number of institutions with 7-12 CIS faculty members in public institutions than in private ones. While no important conclusions were drawn from these figures, they provide additional information in characterizing adopting institutions.

The third and last group of results in the original data, presented in table 3, involved the relationship between public and private institutions and the AACSB membership status of these institutions. It was observed that public institutions have a fairly even distribution of institutions in the three AACSB categories but over 86% of private institutions are not associated with the AACSB. There may be a relationship between the size of the institution (many private institutions have a relatively small student population) and AACSB membership. In order to gain membership in the AACSB, large expenses could be incurred. There are requirements for membership that, among others, could result in significant changes to the institutions' curriculum and credential requirements of their faculty. Small institutions may not be able to afford the costs associated with AACSB membership.

The first result of the collapsed categories is presented in table 4. It involved public and private institutions and their

relationship to student body size. Public institutions tend to have a larger student body than private institutions. While the study did not measure the size of the CIS student body, one might surmise that there is a direct relationship. That being so, a greater number of students would be receiving a CIS education in public institutions than private ones. As can be observed, about three out of every five

institutions that have adopted the model curriculum are public institutions.

The second result dealt with the student body size and the size of the CIS department. Please refer to table 5. In essence, the findings indicate that larger institutions tend to have a larger CIS faculty. This finding would support the contention stated previously that a larger

Table 3. Type of Institution by AACSB Affiliation

Category	Accred	Member Only	Non Member	Total
Public	18	17	15	50
Private	5	9	22	36
Total	23	26	37	86

Chi-Square = 9.096 DF = 2 P < 0.011

Table 4. Type of Institution by Size of Institution

Category	1 to 4999	5000 to 9999	10000 or More	Total
Public	19	18	13	50
Private	31	1	4	36
Total	50	19	17	86

Chi-Square = 21.136 DF = 2 P < 0.000

Table 5. Size of Institution by Size of CIS Faculty

Category	1-6	7-12	Over 12	Total
1 to 4999	26	12	12	50
5000 to 9999	5	8	6	19
10000 or More	0	7	10	17
Total	31	27	28	86

Chi-Square = 16.973 DF = 4 P < 0.002

CIS student body would also exist in larger institutions. If one assumes a direct relationship between number of CIS faculty and number of CIS students, then a way to reach the most students with a new curriculum would be to first target those institutions with a larger CIS faculty with your curriculum adoption strategies.

The third result paired the size of the student body with the AACSB affiliation of the institution. Please see table 6. From this analysis it appears that size of the institution is directly related to the AACSB affiliation of the institution. As the institutions' size increases, the percentage of institutions accredited by

the AACSB increases, and the percentage of non-accredited institutions decreases.

As stated previously, there may be a cost factor associated with AACSB membership that is too great for smaller institutions to bear.

The fourth result suggests some of the same types of results found in the third finding. For the fourth analysis, the CIS department faculty size is paired with the AACSB affiliation of the institution. This result again point up the size relationship with AACSB affiliation. For institutions with a small CIS faculty, more than 50% are not affiliated with the AACSB. For institutions with 7-12 faculty members, there is a more even distribution across all AACSB categories. However, when the faculty size is greater than 12 faculty members per CIS department, a large percentage of institutions in this category (46%) are not associated with the AACSB. It would appear that the size of the CIS faculty variable is not as good a predictor of AACSB affiliation as is the student body size.

The fifth and final collapsed category dealt with CIS department faculties' average years of college teaching and their average semesters of experience with the DPMA Model Curriculum. It appears that there is some relationship between average years of college teaching and average semesters of experience with the model curriculum for faculty in CIS departments. In those institutions where the college faculty averaged 1-5 years of teaching, the majority of these faculty averaged 0-4 semesters of experience. In those institutions where the college faculty averaged 6-10 years of teaching, the majority of these faculty averaged 5-8 semesters of experience. However, because of the short time since the model curriculums' release, this relationship between average years of teaching and semesters of experience does not hold for those institutions where the CIS department faculty averaged over 10 years of teaching experience.

Table 6. Size of Institution by AACSB Affiliation

Category	Accred.	Member Only	Non-Member	Total
1 to 4999	6	15	29	50
5000 to 9999	6	8	5	19
10000 or More	11	3	3	17
Total	23	26	37	86

Chi-Square = 21.552 DF = 4 P < 0.000

Table 7. Size of CIS Faculty by AACSB Affiliation

Category	Accred.	Member Only	Non Member	Total
1-61	2	13	16	31
7-12	12	7	8	27
Over 12	9	6	13	28
Total	23	26	37	86

Chi-Square = 12.262 DF = 4 P < 0.016

Table 8. Years of College Teaching by Semesters of Experience

Category	0-4	5-8	Over 8	Total
1-5	7	2	5	14
6-10	12	20	4	36
Over 10	16	11	9	36
Total	35	33	18	86

Chi-Square = 9.767 DF = 4 P < 0.045

CONCLUSION

The findings obtained from the department and institutional variables collected, have helped to characterize those institutions and their CIS departments that have adopted the DPMA Model Curriculum since its release in 1981 through September 1985, according to the most recent DPMA directory available at the time the study was undertaken. These results have increased the information base about some of the characteristics of adopting institutions and their CIS departments. Some of these results could help the DPMA to develop strategies to insure that updates to the model curriculum will reach the decision makers in adopting institutions and that the content of the model curriculum will potentially reach the decision makers in institutions that have not already adopted the model. The point to be made is this: The more knowledge that developers have about the adopters of an innovation, such as the

DPMA Model Curriculum, the more effective their strategies can become to insure successful adoption of their innovations. The DPMA has answered the call to develop a CIS curriculum in higher education that is responsive to the needs of business by developing a program designed to impart both knowledge and skills to future CIS professionals. The developers of the model have attempted to satisfy the curriculum requirements of those institutions that are currently AACSB accredited or will be AACSB accredited in the future. This important national model curriculum development must continue to evolve and must reach as many more potential adopters as possible.

REFERENCES

1. Adams, D.R. & Athey, T.H. (1981)(Eds.), DPMA Model Curriculum for Undergraduate Computer Systems Education. Prepared by the DPMA Education Foundation Committee on Curriculum Development. Park Ridge, Illinois.
2. Conover, W.J. (1980). Practical Non Parametric Statistics. New York: John Wiley & Sons.
3. Data Processing Management Association. (1985, September). DPMA Model Curriculum Directory for Undergraduate CIS Education. Adopting Colleges and Universities. Funded by DPMA Education Foundation, Park Ridge, IL.
4. Hall, G.E., Wallace, R.C. & Dossett, W.A. (1973). A Developmental Conceptualization of the Adoption Process Within Educational Institutions. Austin: Research and Development Center for Teacher Education, The University of Texas.
5. Rogers, E.M. (1983). Diffusion of Innovations. New York: Free Press.

AUTHOR'S BIOGRAPHY

Kenneth Fougere is an assistant professor in the Computer Information Systems Department at Bryant College in Smithfield, RI. Ken holds a BSBA from Clark University, a M.Ed from Worcester State College, and a Ph.D from Boston College.

He joined the Bryant faculty in 1982 after nine years of teaching in a vocational-technical school setting, and two years as an adjunct assistant professor at Worcester State College. Prior to his entering the field of education, Ken was employed in various capacities in the insurance, medical, and manufacturing fields over a fifteen year period.



STATEMENT OF PEER REVIEW INTEGRITY

All papers published in the Journal of Information Systems Education have undergone rigorous peer review. This includes an initial editor screening and double-blind refereeing by three or more expert referees.

Copyright ©1989 by the Information Systems & Computing Academic Professionals, Inc. (ISCAP). Permission to make digital or hard copies of all or part of this journal for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial use. All copies must bear this notice and full citation. Permission from the Editor is required to post to servers, redistribute to lists, or utilize in a for-profit or commercial use. Permission requests should be sent to the Editor-in-Chief, Journal of Information Systems Education, editor@jise.org.

ISSN 1055-3096