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Does Experience With IT Vendors/Consultants Influence Small Business Computer Education Requirements ?

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Introduction

Despite the advocacy of the involvement of employer groups in the development of tertiary Information Systems (IS) courses (Wattenberger & Scaggs [1979], Rislov [1979], Hansen [1985], El-Khawas [1985], Dawkins [1988], Beeson et al [1992]), studies have suggested that the rapid advances of information technology (IT) have widened the gap between what an individual knows about technology and what they are expected to know to fully exploit it in their organization (Nelson [1991], Trauth et al [1993]).

If rapid technological change has produced an 'information gap' between actual and expected knowledge of that technology, then the resultant decision processes must invariably impact an organisation's ability to successfully implement and diffuse information technology for maximum benefit. Indeed, Klempa [1994] highlights the fact that new insights, new knowledge and new structures (properties of organisational learning) are linked to the diffusion process. Meeting ongoing education requirements is one aspect of enhancing organisational learning, but the emphasis that is placed on this area of IT management by organisations is often too little, too late (Earl [1989]). No more apparent is this than in the area of small business. Indeed, while many studies have examined the needs of larger organizations in narrowing the 'information gap' in the development of knowledge about IT via information curricula (Lo [1991], Ang & Lo [1991], Ang [1992], Trauth et al [1993]), few studies have focused on the technological information needs of their small business counterparts to enhance the chance of IT implementation and diffusion success.

Coupled with this trend it is also apparent, that over the past decade, with the cost of computer technology decreasing, there has been a readiness for small businesses to incorporate computer technology into their business processes. MacGregor & Cocks [1994] report in the Australian Veterinary Industry an annual growth rate in the use of computers of 11% over the past 5 years. Similar figures have been reported in small businesses in Denmark, Greece and Ireland (Neergaard [1992]). While the desire for small business to adopt information technology has increased, the formal skill and knowledge required by most small business managers to plan, implement and maintain that technology has, up until recently remained minimal. Thus most small businesses have tended to rely on vendors for the necessary background knowledge to purchase and use computers.

Recent studies, however, have suggested that there is a move by some small business managers to acquire the requisite knowledge independently, to design their own systems (Neergaard [1992], MacGregor & Cocks [1995]).

When considering curriculum design, Nelson [1991]) suggests that a curriculum which merely addresses the technical issues only provides half of the requisite knowledge and skills necessary to adequately adopt and maintain information technology in an organization. This is supported in the literature by the many studies which point to the problems incurred when organizational issues are not adequately considered at inception of technology (Turner & Karasek [1984], MacGregor & Clarke [1988], Raymond [1988], Sharp & Lewis [1992], Kahn & Robertson [1992], Williams [1992], Bergeron et al [1992], Hedberg & Harper [1992], Bunker & MacGregor[1995]).

Given the advocacy for the involvement of employer groups in the development of curricula, few studies have considered the requirements of the small business community. Added to this is the failure of most studies to address the organizational factors which impinge upon choices for curriculum design. This paper begins by examining the Information Systems curricular needs of the small business responding to this study. It then considers the effect of organizational changes caused by the introduction of computer technology upon those curricula choices (vendor 'pre-purchase' - information, delivery, the IT equipment and 'post-purchase' - training, modifications, manuals).

Computer Curriculum Requirements

A number of studies have been carried out, both in Australia and South East Asia, requiring professional groups to rate curricula inclusions for a potential tertiary information technology course (Ang [1991], Ang & Lo [1991], Ang [1992]). Respondents were provided with 51 commonly taught subtopics (Lo [1991]) and asked to rate these across a five point scale. Lo's 51 topics were a mixture of DPMA and ACM subjects. While he removed the obvious duplications many were left that overlapped one another. Included in Lo's 51 subjects were a considerable group of computer science subjects. Rifkin [1987] indicates that there is considerable disappointment among employer groups with computer science training, particularly when it is considered in terms of the needs of the business. This is supported by Bruce [1991], Gries et al. [1991], Seeborg & Ma [1989], Trauth et al. [1993] and Ang [1992].

More recently Shaw [1991] has suggested that if we are developing a curriculum for use with individuals typical of those in the small business profession, that we need to focus on simple programming, information systems analysis and design, database and spreadsheets as the core to the teaching effort. As such, this current study has condensed Lo's 51 subtopics into 15 distinct groups (see table 1).

Table 1
Curriculum Subtopic Groups

Subtopics	Brief Description
Structure and function of computer hardware	Study of the major components of the microcomputer
Programming	Problem solving and program development
Database/Spreadsheets	The use of database and spreadsheets in common business problems
Business Analysis	Analysis of the major functions and data within the business
Information Analysis	Data modeling techniques
Office Automation	Integration of the microcomputer into the office situation
Business Accounting Systems	The design and use of accounting software
Computer Evaluation Techniques	Techniques for testing and comparing potential hardware and software purchases
Accountancy	Introductory principles of accounting
Finance	Introduction to corporate valuations and financial markets
Marketing	Market segments, buyer behaviour etc.

Business Law Partnerships, liabilities, contracts etc.

Statistics Descriptive and inferential statistics

Management Principles Goal determination, implementation etc.

Interpersonal Skills Verbal written, formal and informal communication

Method

A questionnaire was developed and sent to small businesses in the Illawarra Region (south of Sydney in NSW Australia) which sought information as to the type of small business and the number of employees. This questionnaire was mailed to the manager of each small business, who was then asked to rate each of the subtopics (1, not important - 5, very important) in terms of their requirements for a new member of staff who has recently graduated.

Additionally, respondents were asked to rate their dealings with vendors (satisfactory/not satisfactory) under the following classifications:

- delivery and installation of computing equipment
- availability of information concerning possible systems

- satisfaction with hardware and software
- after sales changes (where applicable)
- vendor training
- vendor manuals and documentation

A total of 600 questionnaires were distributed. Responses were obtained from 131 small businesses, representing a 21.8% response rate. Table 2 indicates the responses in terms of category of small business.

Table 2
Small Business Responses by Category

Financial	45
Industrial	37
Professional	18
Customer Service	31

Discussion

If the overall responses are considered, the results suggest that there is a perception by the small business managers who responded to the survey, of the advantages of some form of training for IS professionals at the tertiary level. This appears to be consistent with the findings of Ang [1991,1992] at a general business level. This would seem to have implications for a tertiary education sector that tends to gear its course structures towards the needs of large organisations. Not only does there appear to be a positive response towards computer courses by small business, but an examination of results would suggest that there is a strong consensus amongst the various small business types, about the type of subtopic that should be included in a small business computer course. These are: Database/Spreadsheets, Business Analysis, Information Analysis, Business Accounting Systems, Accountancy, Office Automation, Evaluation Techniques and Management Principles.

There is a diversity of opinion, however, about each subtopic's relative importance within such a course. The results show that the type of small business together with experience associated with vendor groups, significantly affects the rating of certain subtopic inclusions.

Yap et al [1992] suggest that small businesses are forced to seek help externally due to their size. They add that very often the external agent fails to understand the nature of the business, resulting in a lowering of satisfaction with the newly acquired computer technology. This study would seem to indicate that those businesses that had positive experiences with their IT vendors seemed to have a much more enthusiastic outlook in regards to the training of their IS staff member/s in general and within specific subtopic areas.

Of particular interest, however, is the type of subtopics which appear to be affected by the various measures of satisfaction. Broadly, it would appear that dissatisfaction with those criteria which might be termed 'pre-purchase' - vendor information, vendor delivery, the equipment itself, tend to affect those subtopics which have been deemed essential. Dissatisfaction with those factors which might be termed 'post purchase' - training, modifications and manuals tend to affect those subtopics not deemed essential.

The study also highlights a number of trends. Firstly 87.7% of respondent organizations required changes to be made by the vendor after the initial installation. Secondly, 32% of those organizations indicated that they were not satisfied with the changes that were made by the vendor. The current survey has also found that 46% of the respondents were not satisfied with the level of training, while 42% expressed dissatisfaction with vendor supplied documentation and manuals.

Conclusion

This study has presented a number of factors which appear to have affected the rating of inclusions into an undergraduate computing course. Although the results may have important implications, as to the appropriate inclusions and format of a small business computing course, additional research is required in a number of areas. Firstly, the reasons why specific factors only affect certain subtopics require that these factors need to be refined and followed up with extensive interviewing. Refining these measures would improve the reliability and validity of the measurement instrument, especially if it were to be reused in a broader selection of small businesses, as well as in understanding the underlying result of this study. Secondly, a wider study needs to be undertaken to determine if these factors affect small businesses in other countries or other locales. Finally, a more intensive examination as to how small businesses communicate with vendors, needs to be undertaken to determine why various levels of satisfaction affect only certain curricular inclusions and whether or not this is of any real significance.

References and supplementary tables are available upon request from Deborah Bunker.