



1401253961

**SWP 10/92 "INFORMATION TECHNOLOGY FOR MANAGEMENT
EDUCATION: THE BENEFITS AND BARRIERS"**



MICHAEL T SWEENEY
Operations Management Group

and

IAN ORAM
Information Systems Group
Cranfield School of Management
Cranfield Institute of Technology
Cranfield
Bedford MK43 OAL
United Kingdom

(Tel: 0234-751122)

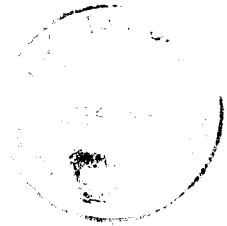
(Fax: 0234-751806)

Copyright: Sweeney and Oram 1992

Information Technology for Management Education:
The Benefits and Barriers

by

Michael T. Sweeney
and Ian Oram
School of Management
Cranfield Institute of Technology
Cranfield
Bedford MK43 0AL



Abstract

Research suggests that information technology (IT) can be a very effective distance learning medium. Its use for postgraduate management development is both untested and insufficiently researched. This study was designed to evaluate the application of IT for this purpose. The paper is a report on the educational benefits that ensued the issue of an IT package designed specifically for use on a part-time MBA programme. The IT package consisted of wordprocessing, spreadsheet and communications software (via Telecom Gold) and a personal computer. Questionnaires were used to research the effect that the ownership of this IT system made to the final IT competence of the students and to the educational quality of the programme. The study results show that the students' expertise with the use of IT was significantly increased. The study also found that the development of the students' abilities to use IT for communication purposes perfectly fitted the IT competency needed by the general manager of the 1990s; this was also researched by questionnaire. These research findings show that the required breadth of expertise in IT, needed by the general manager of the 1990s, can only be partially developed by teaching methods limited to talk, chalk and computer studio training.

One of the most important elements of management education at Cranfield is learning by the case study method. The study findings show that learning by this method was enhanced by the creation of a communications network because the part-time students were able to use it for off-campus study group communications. The research also discovered that little use was made of the PCs by faculty to communicate with their students or as a tool to complement current teaching practices; more time, money and academic commitment will be required before such uses of this technology are practised.

Information Technology for Management Education:

The Benefits and Barriers

Introduction

Information technology (IT) has significantly but not entirely overcome the barrier of distance. Previous research in using IT for distance learning purposes has shown that it can be a very effective learning medium¹. Maxey and Maxey found that students using computer technology in distant learning activities rated both the technique and the instructor higher than students in the same course with the same instructor using the traditional face-to-face approach. Subsequent similar research² supports these initial findings. What, therefore, has inhibited a greater use of IT in part-time management education since the efficacy of IT to improve distance learning appears to have been proven?

One reason may be a paucity of good quality educational material for use with computers. Another reason may be a lack of incentive or a resistance to change. The explanation is probably a combination of all these reasons. What is clear is that further research is needed.

There is also an economic reason. Until very recently the use of IT as an instrument for individual learning has been prohibitively expensive. However, the reduced purchase price of the microcomputer has helped lower that barrier. It is therefore opportune to research the potential benefits of using microcomputers for individual learning purposes. If this technology can be used as an aid to distance learning, a designer of a management development programme would need to know the costs and the benefits that result from the use of IT for this purpose; the programme designer also needs to know whether such a use of IT will enforce a change to the

traditional course design and the effect that using a computer for distant learning activities has on the perceived quality of the programme?

This paper presents the results of a study designed to examine these issues. Its aim was to research the benefits of using microcomputers to facilitate distant learning activities. An important behavioural issue also of interest was whether any different methods of learning were practised by students linked by electronic mail to those practised by students without such a communications capability.

The findings detailed in this paper result from a two year study which focused on the 1989 Cranfield Executive MBA Programme. A total of 59 students attended this part-time Master in Business Administration programme.

The paper consists of four parts. In the first part, a theoretical model of the process of learning by the case study method is presented with a more detailed explanation of the study's research objectives and methodology. The theoretical model of learning by the case study method is presented to illustrate the types of communication that are so critical to learning by this method. The model has been used to help identify where an IT capability could improve the quality of communications between separated study group members. The second and third parts of the paper consist of the presentation of the study results and an explanation of the conclusions drawn from these findings. The final part of the paper is a description of the barriers to technological change that have been overcome and those that remain.

Background

Lord Franks, in his 1963 report³ on management education in the UK, recommended that the most critical educational need of that time was to increase the competence of managers to cope with a rapidly changing business environment, the accelerating pace of technological innovation and the growing international competition facing British firms. Since that time business problems seem to have changed little in type but significantly in intensity.

Lord Franks emphasized a need for increased managerial competence rather than the achievement of academic prowess, because he believed business management to be "an intelligent form of human activity; not intellectual, nor academic, but practical in nature".⁴

To balance the theoretical and the practical, most business schools use a variety of methods to simulate "real world" problems. These include case studies, the use of business games and in-company project work on real business problems.

However, business schools continue to be criticized for the disproportionate amount of effort spent on the development of some practical skills. A commonly quoted criticism of the products of MBA programmes is that they are excellent analysts and team-workers⁵ but gain little from the MBA programme on managing and using technology⁶ and managerial leadership⁷. The search for new methods to develop a better understanding of the management and use of Information Technology was stimulated by this criticism of MBA programmes.

The solution proposed was to create an IT network designed to enable the creation, transfer, receipt and storage of educational information. It was assumed that using the network to facilitate education management would increase a student's

understanding of how to use similar technologies for business management. Experience with its use should also increase confidence.

These are not the only benefits to be gained from a higher level of competence with using IT. This technology may also have a part to play in the educational process itself. The combination of its potential to overcome the problems of distance and its effectiveness as a learning medium qualify it to be an educational aid that should be used for part-time management education⁸. However, the benefits that may result from the use of IT for part-time management education are unknown and require investigation.

These were the reasons for researching the use of IT for management education. Each student on the part-time or Executive MBA programme at Cranfield was supplied with an IT package consisting of a microcomputer and printer, software designed for communication and business management uses and a modem.

A Model of the Case Study Learning Method

The limited use, by UK business schools, of information technology as an aid to learning may be explained by an uncertainty about its effectiveness when compared with the time-honoured method of face-to-face instruction. The cause of this conservatism may be a satisfaction with the status quo, or perhaps it is a concern that the use of technology impersonalizes education, rendering it less effective than the traditional method.

Hashway⁹ describes communicating as the "process of moving ideas from one mind to another mind". Such a definition could also define the act of teaching when the ideas transferred are of an educational nature. Such an exchange of views about a business problem is an accepted form of action learning. For such an exchange to be

educationally beneficial, the discussion must be focused and founded upon a clear understanding of the problem. This is one reason for using case studies for management development¹⁰.

Figure 1 shows how action learning using the case study method should be practised to obtain the maximum educational benefit. Also shown is the sequence of the action learning tasks and how they are carried out by the full-time MBA students at Cranfield. Figure 1 also shows the learning objectives of each stage of the case study method of action learning.

The foundation for the whole learning process is the student's initial examination of the case study problem. This analysis must therefore be thorough. To help the student with the case analysis, readings are also provided on a management theory or practice pertinent to the problem described in the case. On occasion, it may also be helpful to obtain clarification about some information given in the case. This may be sought from fellow students or from the faculty. It is also sometimes useful to seek guidance on the method of problem analysis to use. All of these forms of assistance are conveniently available to the full-time student. Unfortunately, the opportunity to obtain any help or support of this type is very limited for the part-time student, which is one of the disadvantages of part-time education.

A survey was carried out in 1987¹¹ to investigate the potential benefit that electronic mail could provide to participants on the Executive MBA programme. The students reported that they thought that a communications link would establish a capability for a better exchange of ideas on a case problem which should improve their preparation of case studies. In the Cranfield School of Management, the case study method of learning remains central to the MBA teaching philosophy. It is clear from figure 1 that the case study method of management development may require a

variety of communications to take place in order to maximise learning. These could be some or all of the following:

1. Student to Student
2. Student to Study group
3. Student to Study group supervisor (Academic assigned to support the group)
4. Student to faculty
5. Student to Administration

The survey was therefore designed to determine which of these five forms of communication were the students' greater needs, the reasons why these contacts were important and their assessment of the value of electronic mail to meet their communication needs.

The results of this initial survey¹² showed that the greatest communication need was between the individual student and his/her study group colleagues. This need is greatest when "preparing work for class discussion and work that will be submitted for marking"¹³. The students also thought that the communication link could provide the highway for giving and receiving the personal and emotional support that many of them need to overcome the feeling of isolation created by distance from the campus and each other.

The survey results, using the 1-7 Likert Scale, were as follows¹⁴:

<u>Communication Line</u>	<u>Mean Source (1-7 Scale)</u>
Student to Student	4.00
Student to Student's Study Group	5.44

Student to Study group supervisor	3.91
Student to faculty	4.71
Student to Administration	4.42

This survey has therefore, provided some initial data on how a communications network could facilitate action learning for participants on an Executive MBA programme. To be able to communicate with fellow students about case analysis problems is a very important element of the action learning process. However, distance tends to isolate the part-time student and consequently, it can inhibit communication of the types previously described or other similar forms of support. Technology could help overcome this barrier to communication. An electronic mail facility to enable the transfer of documents and messages between the students, the faculty and the course administrators would enable the convenient exchange of ideas to take place. Such a communication capability could increase the students' opportunities to learn because messages sent via the electronic mail facility could substitute for the informal face-to-face exchanges that take place during the residential periods at Cranfield.

However, the decision to insist that students should possess the technology required to enable such communications to take place would depend upon a study of the actual extent that students did communicate in the ways described and the perceived educational value of these exchanges.

The Study Objectives

The main objective of this study was to discover what educational benefits were realized by using a microcomputer for both communication and distance learning purposes. Within this broad objective there were three main issues to be examined:

1. Whether the ownership and the use of the issued IT package increased a part-time MBA student's understanding and use of IT. The evidence sought was that of additionality, i.e. the skills and knowledge gained were additional to those learnt by purely practical exercises performed in a computer studio. Any additional skills or knowledge gained must also be considered to match those that are forecast to be needed by a business manager of the 1990s.
2. If the communications network was used to exchange knowledge and to facilitate study group working. If evidence of the transfer of electronic communications was found, whether the students found that such communications enhanced their learning.
3. Whether supplying PCs to the students will stimulate an increased use of computer based learning methods and the adoption of innovative pedagogical methods.

The main research issue was a study of the extent that individual distant learning activities were supplemented "by a little help from your friends". The full-time MBA programme is designed to promote learning through the sharing of experience but the opportunity for study groups to learn by this method on a part-time MBA programme is very limited. It was therefore hoped that IT would become the means for part-time MBAs to continue their exchange of experiences when they were off-campus. Such exchanges are fundamental to learning by the case study method.

Study Method

Four questionnaires were used for this study. The first was completed by the students during the first residential week of the Executive MBA programme, i.e.

during the last week of January 1989. This was approximately four weeks before the portable personal computers, peripherals and software were distributed to them.

The first student questionnaire was designed to answer the following questions:

1. The extent of the personal computing experience that each student had gained prior to joining the part-time MBA programme and their experience with the use of the more common forms of the business applications software, i.e. wordprocessing, electronic mail and spreadsheet packages.
2. What specific business education and management development objectives they thought they could personally achieve through the use of a PC and its applications software, if any?
3. What general business education and management development benefits they thought could be gained from using the PC and the software supplied whilst attending the MBA programme, if any?

The purpose of this questionnaire was therefore to establish a bench mark on the personal computing experience of the group. It was also to ascertain the students' expectations about any additional benefits that they thought could result from the opportunities created by ownership of a PC and its applications software. The objective for seeking the latter information was to try to measure any change to the perceived quality of the MBA programme. If the students, at the end of the programme, reported that their expectations for IT management development had actually been exceeded then such a finding would substantiate an improvement to programme quality. The validity of this conclusion would obviously be dependent upon proof that some of the benefits gained were additional to those obtainable from previous programmes.

The second questionnaire was designed to be completed by the faculty and to obtain answers to the following questions:

- 1. Their level of computing experience**
- 2. Their knowledge of computer aided learning packages, both in terms of the existence of software appropriate for use on a MBA programme and their experience with the development or use of such software.**
- 3. Their assessment of the educational or the developmental benefits to be gained by supplying a PC and business application software to each student.**
- 4. Whether the ownership of this IT package would induce any change to the way that they currently teach on the MBA programme and their assessment of the potential benefits to be gained by using the computer as a learning medium.**

This questionnaire was therefore designed to assess the resources of the School of Management to design, develop or use computer based training or computer based learning methods. In addition, the attitude of the faculty to the value of using computers for management education was researched because the rate of change to using alternative methods of teaching is primarily determined by them. The rate of change to the use of such methods will also be determined by the resources that are available to seek, test or develop computer aided learning software. For this reason, faculty was asked to assess the timescale for any future changes to teaching methods that they would make if all Executive MBAs were required to own a PC.

The third questionnaire was designed to be completed by a senior manager of each company sponsoring a student on the programme. The questionnaire was sent to the manager who authorized the sponsorship. The objective was to survey senior managers from all functions of a business in order to obtain a general management view. Thirty eight completed questionnaires were returned and only two were completed by IT departmental managers.

The results obtained from this questionnaire are of special interest because they represent the views of practising managers who have the responsibility for the development of their company's future senior management. Of particular interest is the expertise they consider will be needed by the senior general managers of the 1990s.

The questionnaire was designed to obtain answers to the following questions:

1. The nature and size of the company and the extent of its use of IT.
2. The types of IT applications that are already available for use by management in the company and those planned or expected to be available for general use in the future.
3. The information technology expertise needed by the company's middle management now and in the future.
4. The relevance of supplying the PC and the selected applications software to the development of the current and future management development needs of the business.

If this study confirms that the supply of a PC, with the applications software selected, has helped the development of the skills and knowledge that are needed by the sponsoring firms now and in the future, then the case will have been made for each Executive MBA student to possess this IT capability on future programmes.

The final questionnaire used was one again designed for the students but this time distributed at the end of the two year programme. The objective for the use of this questionnaire was to obtain answers to these questions:

1. The actual use made of the PC and the selected applications software during the two year programme.
2. The extent that computer based learning methods had been used with them and their evaluation of this approach to management education.
3. Their assessment of their level of expertise at the end of the programme with the use of the applications software provided.
4. What personal management development benefit they had gained from ownership of the IT system, if any, and whether they consider this to be relevant to the management development needs of the future.

Study Results

Each student was supplied with a Hewlett Packard LS/12 portable computer with a 20MB hard disc and MS-DOS 3.3 operating system. In addition, a modem and a printer were provided.

The portfolio of applications software supplied consisted of Word, Twin (a spreadsheet software package similar to Lotus) and Chitchat (the communications software). Telecom Gold was used for the management of electronic mail. The communications network linked students, faculty and the administration in the School of Management. It should be noted that eight study group supervisors, i.e. those member of faculty assigned to each study group to provide support to its membership, were also supplied with the capability to connect into this communications network. All these members of faculty taught on the part-time MBA programme.

A. Communication Network Use

The use of the communications network was monitored not only to assess the frequency of use but also to discover the type of communications that were made, i.e. student to study group, student to all students on the course etc. An analysis of these findings is shown in figure 2. In order to gauge the students' assessment of the significance of this communications capability to them, they were asked to indicate on the questionnaire how frequently they checked their electronic mailbox. Their answers to this questionnaire are shown in figure 3.

Figure 2 shows clearly that considerable use has been made of the communications network. The research findings also show that the most frequent forms of communication were between student and study group (see figure 2) and the Administration to the Students (see figure 4). An analysis of the transfers of information made between study group members, which were monitored over a four week period, showed that their purpose was both educational and organizational. The types of exchanges that were observed were as follows:

- (a) Individually prepared precis of lengthy recommended readings as a brief for other study group members and for retention to use for revision.
- (b) The exchange of case analysis material for comment and individual use in the preparation of a written analysis of a case.
- (c) The transfer of information pertinent to study group preparation of a joint project report.
- (d) Communications concerning problems both academic and organizational.
- (e) Communications on the sharing of case preparation activities in readiness for group discussion during the residential periods in Cranfield.

The data shown in Figure 3 indicates that not all students were working together as closely as those who were communicating in all the ways detailed previously. In fact, only 58% of the students who completed the questionnaire (N=48) exchanged WORD documents via the network and 48% file transferred spreadsheets. However none of these exchanges of educational information could have been as easily made by students on previous Executive MBA Programmes.

B. Expertise in the Use of IT for Business Management Activities

A course design problem, common to many business schools, is the planning of a training programme on the use of personal computers for a group of students who possess a wide range of previous computing experience. Previously the approach adopted by the Cranfield School of Management was to include in the MBA programme a training course of approximately fifteen hours on personal computing in the school's computer studio. For those with previous computing experience these

training sessions were of no value because the training was designed to give a novice a basic understanding of a range of applications software. For the novice it was of limited value because further practice was always needed but, in many cases, could not be attained because a PC was unavailable at work or at home.

The group of students who joined the Executive MBA in 1989 were typical of those who had attended previous programmes. 42% were supplied with their own PC at work, 20% did not have access to one and the remainder shared a PC at work. The previous experience of this group with the use of wordprocessor and spreadsheet software was also mixed (see figure 5). As a consequence a menu of tutorials for training on different software package was organized and each student could then select the tutorials that he/she needed to attend¹⁵. The advantage that this group of students had over previous courses was the unlimited opportunity to practise in the risk free environment of the home. Previous research¹⁶ has shown that an individual's attitude to IT, for example, a fear of the technology or the loss of status when faced with a PC, can be the barrier to learning to become an efficient user of this technology. Therefore, home use with support from the School of Management or the study group is a low risk means of overcoming this barrier to personal development.

Figure 5 shows how the ownership of the microcomputer, with the stimulus that all assessed course work must be prepared using the wordprocessor, has produced an almost universal gain in expertise with the use of the information technology supplied.

The significance of these improvements can only be assessed objectively by investigating whether the students placed any value on the development of this particular expertise. Another measure must be whether their sponsors consider this

form of education and training to be appropriate to their employees' current or future needs as managers in their businesses.

The sponsoring companies were requested to report their views on this issue in mid 1989, i.e. about six months after the programme had started and a short while after the students had been supplied with their PCs and software. Their responses to an enquiry about the relative importance of the range of IT expertise needed by a general manager now and in the future are shown on figure 6. Their replies confirm the views of Drucker¹⁷ and Coulson-Thomas¹⁸. Drucker's view of the future is one where there is an increased onus on the individual to take 'information responsibility'. The managers surveyed seem to confirm this view by an almost unanimous agreement that the manager of the future must be able to access and manipulate data obtained from a remote source. Coulson-Thomas adds an additional dimension to this view of the future. "As work is increasingly being undertaken by multi-disciplinary, multi-national and multi-organisational teams there is an increasing requirement for information technology that can facilitate multi-location group working"¹⁹. Therefore, individual responsibility for information may not be limited to only the use of information generated inside the firm.

The creation of the communications network and its use for educational purposes has prepared the MBA students for working in an environment where an individual manager must take 'information responsibility'. The use of the communications network to prepare a written analysis of a case or to produce text for a study group project report is a simulation of a manager working in Drucker's new organisation. It is however, not a comprehensive simulation because the capability to access remote databases was not available to the students.

The students' view of the developmental benefits gained from their ownership of the PC and the use of the communication network are as follows:

- (1) 90% of those who completed the questionnaire reported that they benefitted from the use of the IT system. The benefits consisted of either improved skill in using the technology or enhanced learning through the assistance of others. The research results also show that 56% of the students obtained a greater educational benefit than a skill development and that almost all students improved their ability to use the PC (see figure 5). These findings are shown on figure 7.

- (2) Of that fifty six percent, for 38% or 18 students the greatest benefit was the assisted learning gained from the exchange of ideas and experiences communicated through the electronic mail facilities. An analysis of these message exchanges (shown in figure 2) shows that a significant number of students sent electronic messages of an educational kind, i.e. 58% of the course membership sent word documents to others in their study group and 48% sent spreadsheet analyses. These statistical results are however misleading because they probably underestimate the extent of the educational benefit gained from improved study group communications. The statistics quoted do not provide data on the total quantity of the educational messages sent. It is therefore difficult to measure the total educational benefit of these exchanges and it can only be estimated by canvassing the students' evaluation of their worth.

Conclusion

The study data show that the electronic linking of MBA students to each other and the Cranfield School of Management has provided the opportunity for the students to improve their expertise with the use of the supplied software and to improve inter-

group communications. It has also been frequently used by the course administration to facilitate the management of the programme.

Figure 1 shows the three action learning activities performed when practising the case study learning method. It also details the learning objective of each stage and how learning occurs. The survey data, shown in figure 3 and in figure 7, demonstrates that the desired transfer of information by electronic mail did actually take place and that those exchanges which were carried out for academic reasons were claimed subsequently to be educationally beneficial. Therefore, the process of learning appears to have been assisted by using the network for the exchange of ideas and further information. This has enabled a more thorough case analysis to be made off-campus.

In addition, the data shown in figure 7 and in figure 5, provides evidence of the participants' belief that their expertise in the use of the supplied business applications software has markedly improved. The sponsoring companies' views on the IT expertise required by their management now and in the future is illustrated in figure 6. It is clear from figure 5 that the most of the students on the part-time MBA programme have the desired expertise. The communications network has been instrumental with the development of the skills needed by the manager with information responsibility.

Figure 4 shows that there was very little communication between the study group supervisors and their students. It is still unclear whether this low level of communication is because little contact is necessary or whether an unfamiliarity with the technology or inertia is the explanation. The role is more a supportive and social one and therefore, it is peripheral to the mainstream objective of learning. Similarly, the data shown in figure 2 indicates the students' lack of need to send messages to

the study group supervisors and suggests that this communications link is not an essential requirement for the students.

Figure 4 also shows that the communications network appears to be an important communications channel for the administrators of the Executive MBA programme. Its major value is the increased degree of confidence that everyone receives a copy of messages sent.

For academic purposes, electronic tutorials are an obvious extension to the learning methods observed to date. The first trials have recently taken place. Two tutorials were given and consisted of a tutor request for the student body to electronically mail a discursive essay on a chosen academic topic. Once received, the tutor's own analysis of the issue was mailed to the students. Subsequent points of clarification were communicated by both telephone and electronic mail. The tutorials were considered to be a worthwhile extension to the range of teaching methods used on the programme. This is an ideal use of this technology for academic purposes and it is planned to organise more electronic tutorials in the future.

The Barriers

This study of the use of information technology in management education has demonstrated how the students have creatively used the technology supplied to them to their advantage. The study did not provide much evidence of the use by academics of computer aided learning methods. There are two reasons for the very limited benefit that students gained from computer based learning (see figure 7), i.e. the quantity of material available and the attitude of faculty.

A section of the faculty questionnaire was designed to research what computer based learning packages were known to faculty and their attitude to their use. The survey

results seem to show that the supply of appropriate material is very limited, a total of fourteen software packages were described and four of these had not been used previously by them. These were the findings from 42 questionnaires completed by the School of Management faculty.

This shortage of computer based learning material for management education is not unique to UK business schools. The findings of a similar survey in America²⁰ identified that "faculty incentives for developing courseware" headed the list of issues that are challenging business schools in America. Their aim is to achieve a greater application of computer technology for instruction and an increased level of education on its management in the curriculum. This would also seem to be an appropriate objective for UK business schools.

To increase the use of computer based learning methods will require academics to either develop their own applications software or they must find and learn how to use others that are commercially available. Whatever approach is taken, IT for management education is not about saving money²¹. Developing computer aided learning software will require time and scarce business school resources. To achieve any form of technological change, it is necessary to have the backing of senior management, the appointment of a champion to lead a team committed to the change and the financial resources needed to accomplish the change within the targeted time. However, the creation of computer based learning packages for management education cannot be achieved without an acceptance of their academic value to business schools in the UK and this is a real constraint on the rate of change.

Figure 1

**Action Learning Using the Case Study Method
in Management Education**

Degree of
Structure to the
learning process

Individual
Reading of Case
Study and Related
Academic
Readings

Group
Discussion about
the Case Study
and the case
assignments

More Formal
Face-to-Face
Plenary Session
for Discussion or
other forms of
action learning
e.g. by role
playing or
business game
playing etc.

TIME

t = -2 days
(EVENING)

t = -1 day
(AFTERNOON)

t = 0 or today
(MORNING)

Activity
Descriptions and
Learning
Objectives

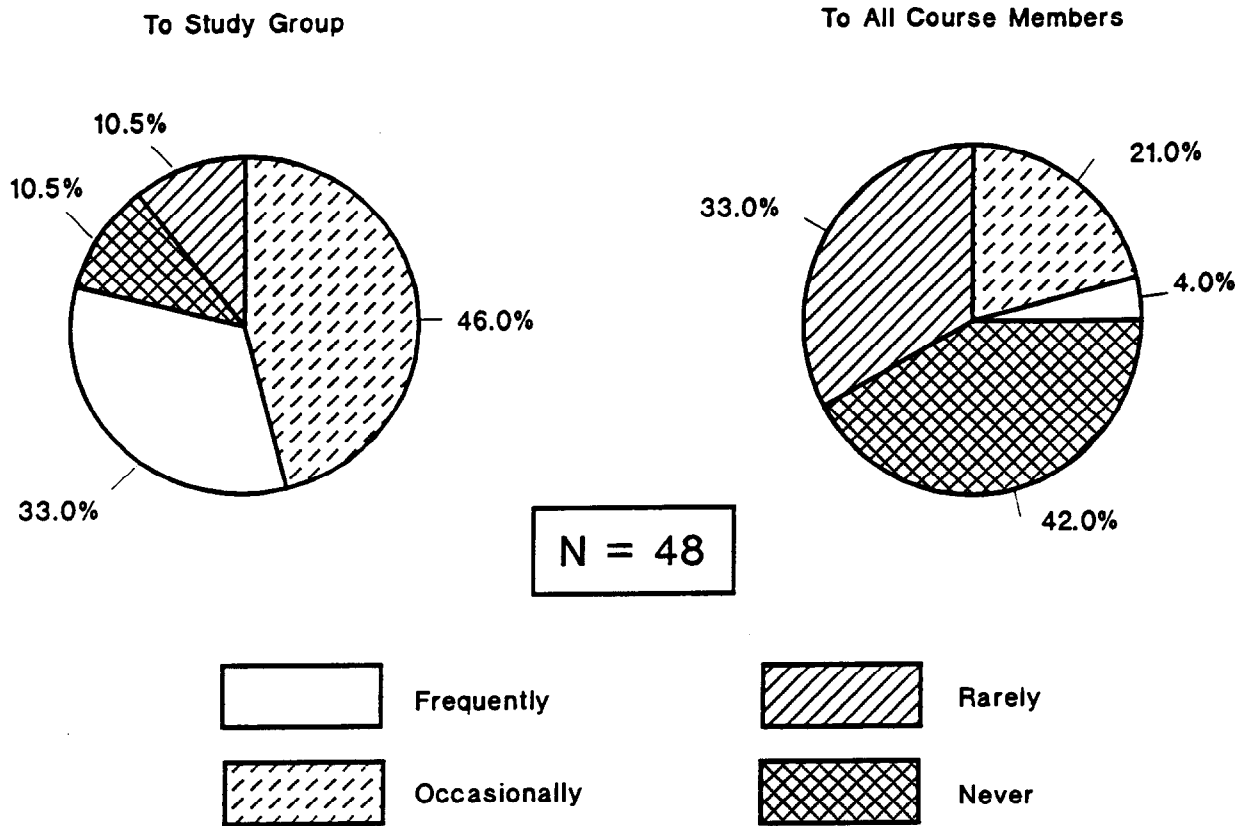
1. Critical Examination of the case study problem and analysis
2. To apply information contained in the text book or readings and attempt to resolve the assignments set on the case study by
3. Applying the ideas and concepts formulated from the readings to the problem described in the case study

1. One group member presents a detailed analysis of the case and solutions to the assignments set.
2. Individual learning by each member of the study group is enhanced by the group discussion of the presented solutions to the case assignments set.

1. Examination of study groups' answers to the case assignments and their reasons for their answers.
2. Reinforcement of learning points that were the learning objectives for the use of the case study.
3. Explanation of any issues not understood.

Figure 2
Analysis of Communication Types

1. Student use of Telecom Gold to send messages to other students



2. Student use of Telecom Gold to send messages to the School of Management

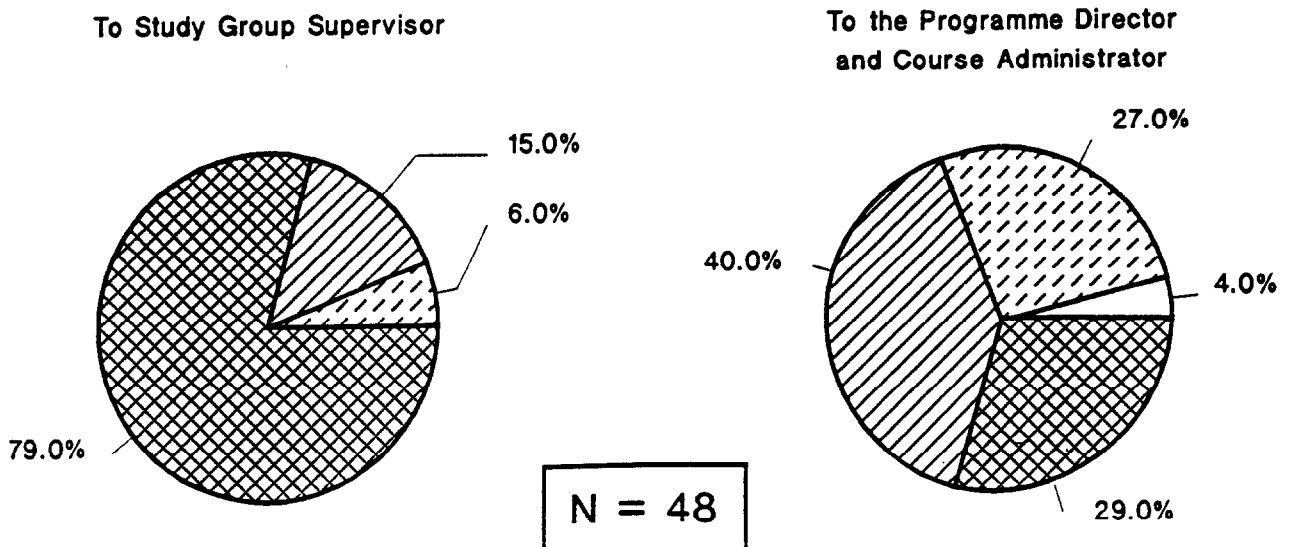
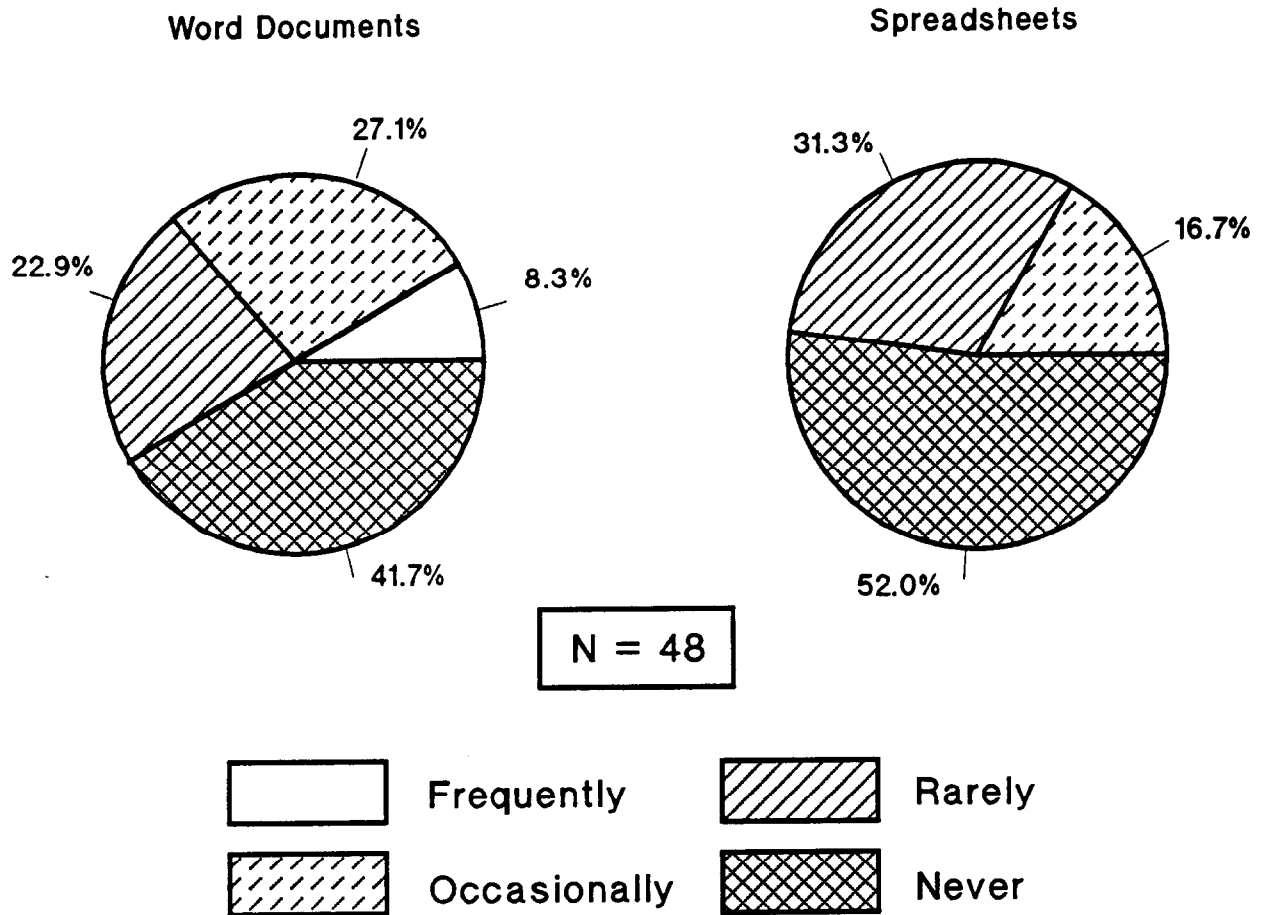


Figure 3

1. Student use of Telecom Gold for File Transfer



2. Frequency of access to Telecom Gold mailbox

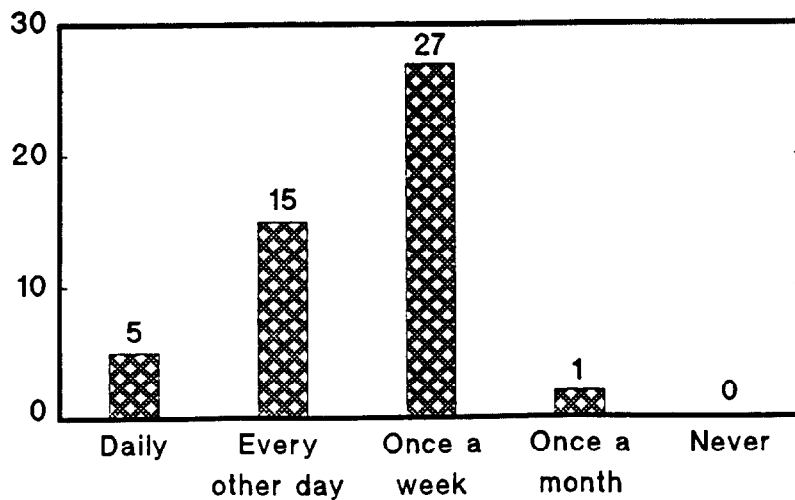
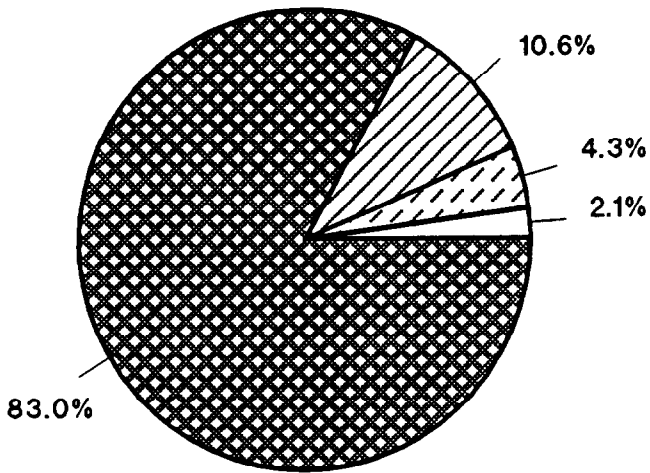


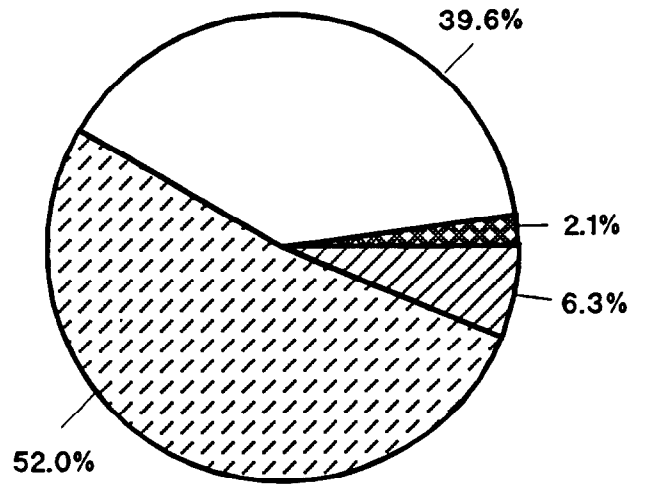
Figure 4
Analysis of Communications made by
School of Management

Messages sent by
Study Group Supervisor



N = 47

Messages sent by
Course Administrator



N = 48

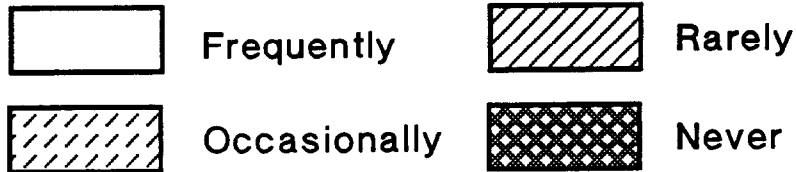
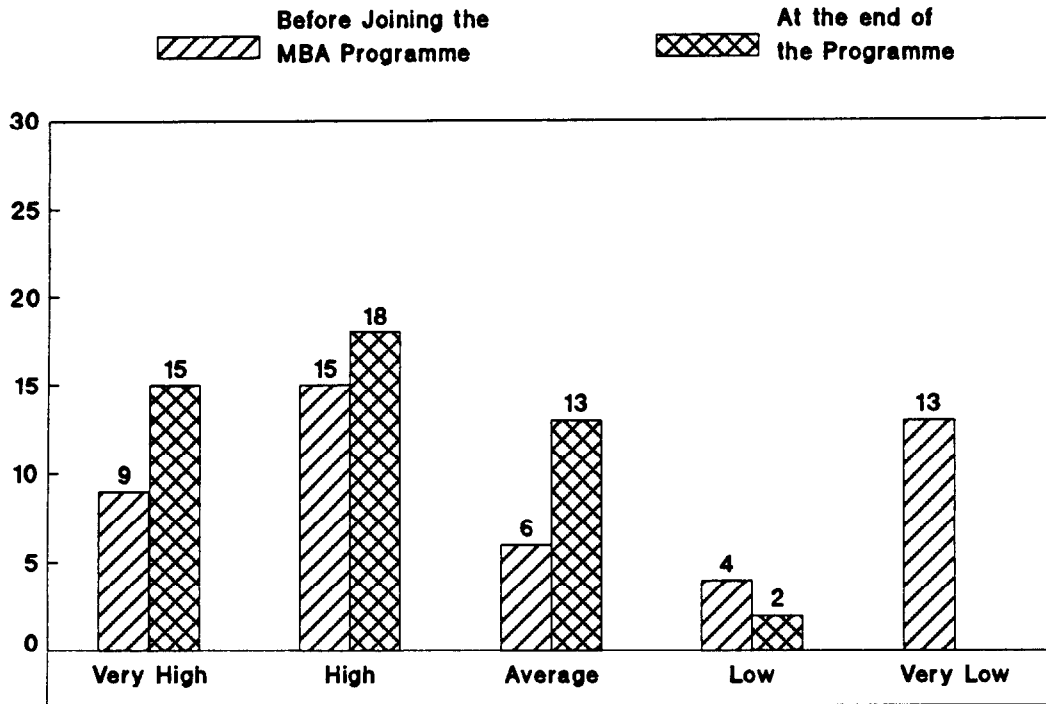
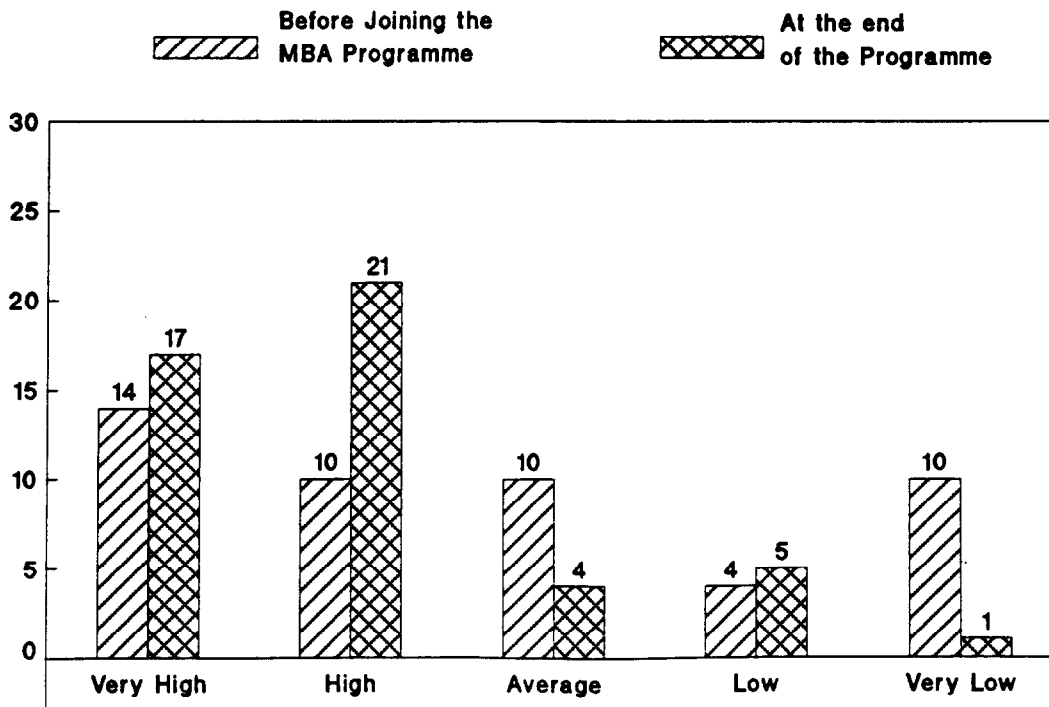


Figure 5
Analysis of the Improvements in
Expertise with IT

1. Expertise with the use of a Wordprocessor



2. Expertise with the use of Spreadsheet software



3. Expertise with the use of a PC for telecommunications

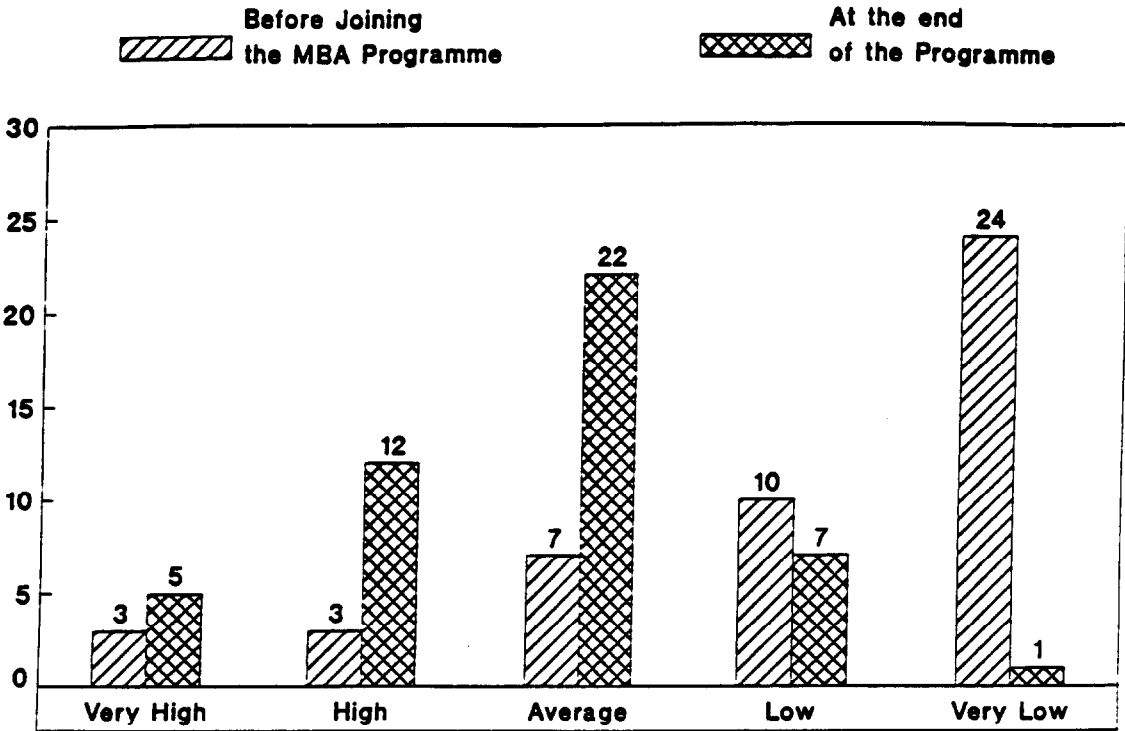


Figure 6

Question: In your opinion, which of the following defines the information technology expertise needed by the company's management now and in the future? Your answer should be limited to the skills and knowledge needed by middle management (i.e up to and including the first level of general management), for the effective performance of his/her role in the company

N = 33

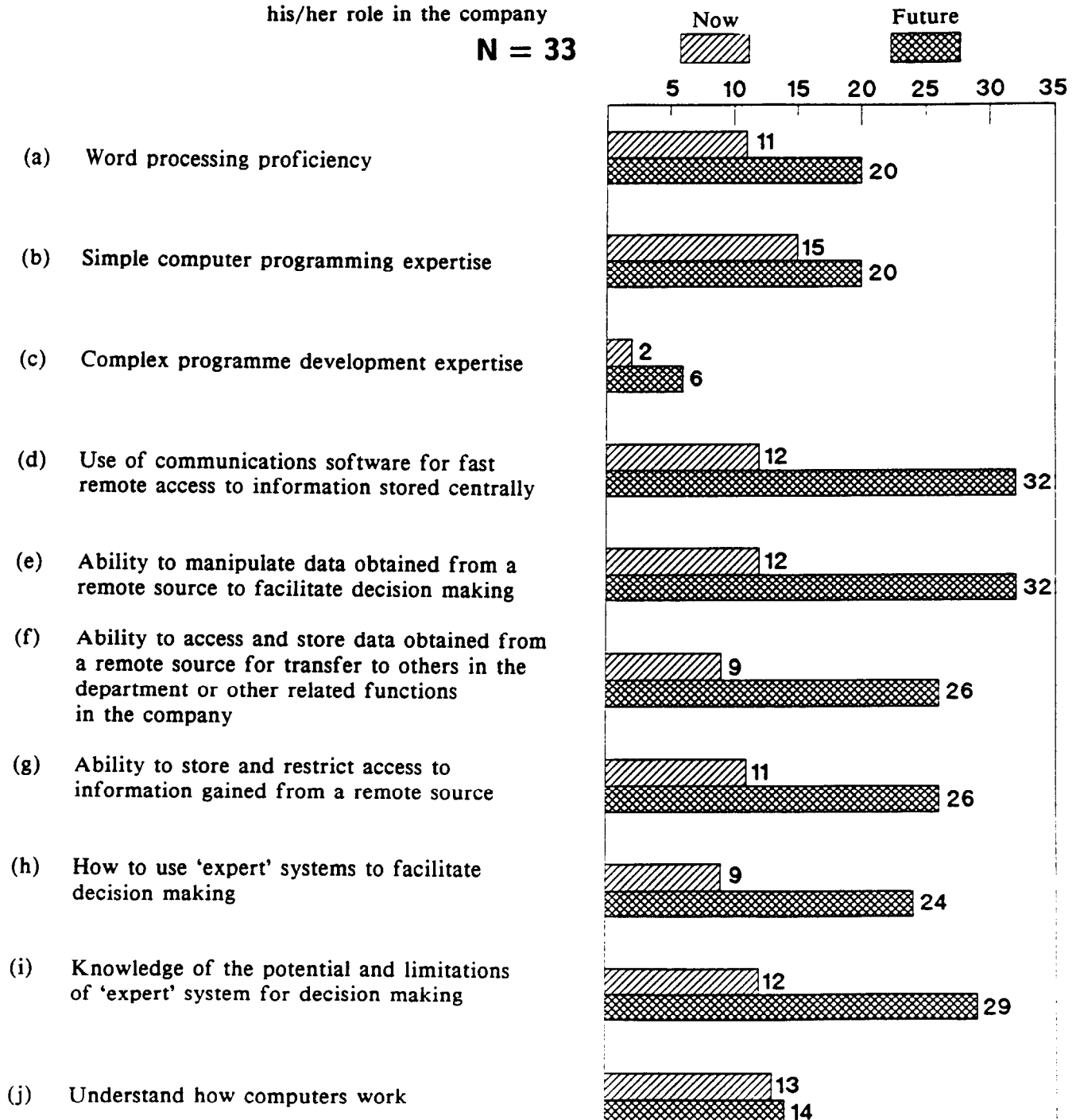
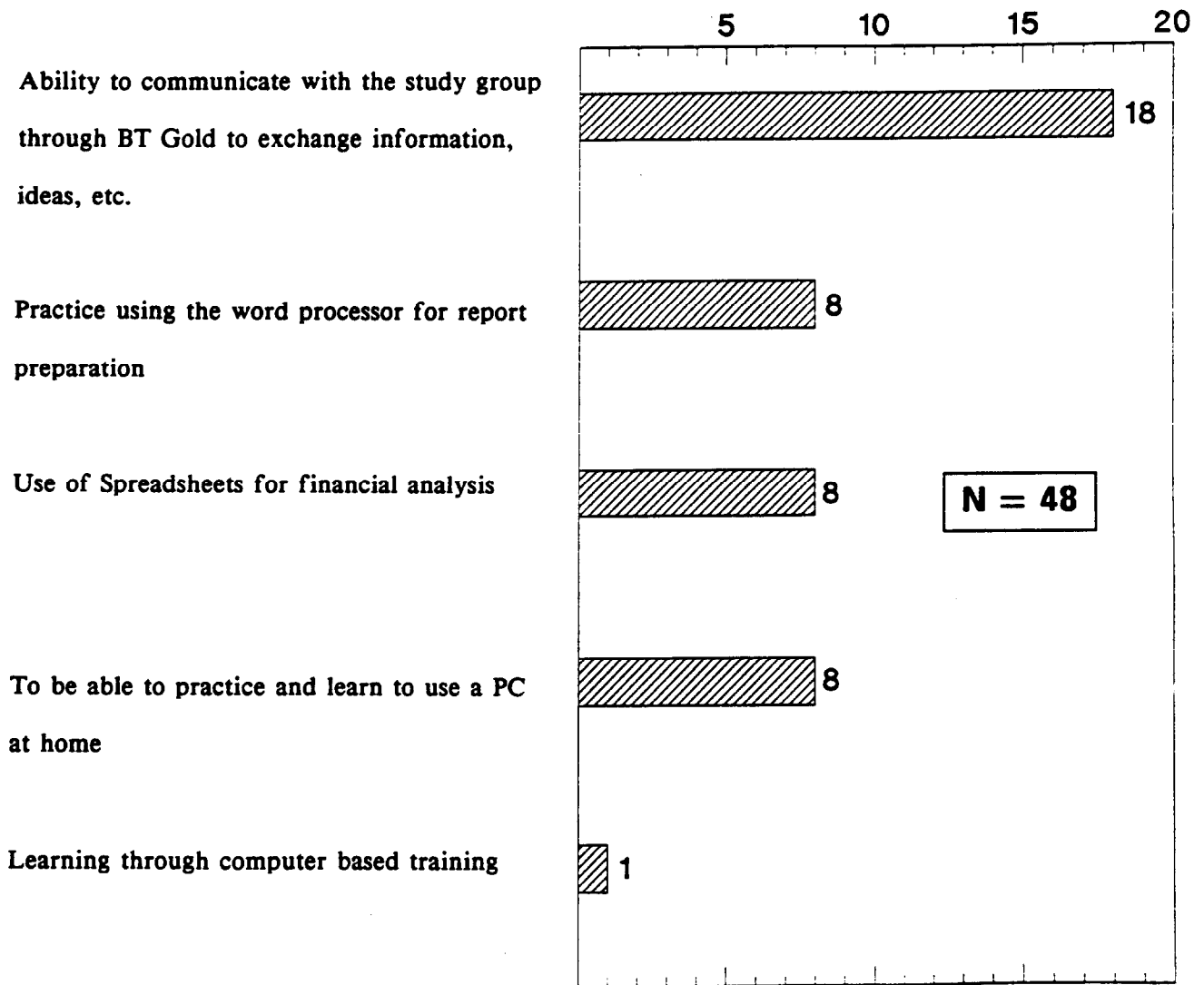


Figure 7

Question: The most beneficial educational or developmental experience that I gained from using the information technology package provided for the Executive MBA Programme was:



References

1. MAXEY, D.O. AND MAXEY, S.J., "*Computer/Telephone Pairing for Long Distance Learning*", Educational Technology Systems, 15 (2), 1986, pp.201-211
2. FOELL, N.A., "*Using Computers To Provide Distance Learning in New Technology*", Paper Presented to the American Vocational Education Research Association at the American Vocational Association Convention, Orlando, Florida, Dec. 1989
3. FRANKS, "*British Business Schools*", British Institute of Management, London, 1963
4. FRANKS, *op.cit*, para 6
5. LEAVITT, H.J., "*Educating Our MBAs: On Teaching What We Haven't Taught*", California Management Review, Spring 1989, pp38-50
6. MAIN, J., "*B-Schools Get a Global Vision*", Fortune, Volume 120, No. 2, July 17, 1989
7. LEAVITT, *op.cit*, pg. 40
8. SIMON JR. J.J., "*A Report Card on America's Business Schools*", Management Review, December 1989, pp.26-29

9. HASHWAY, R.M., *"From Text Processing to Communications, The Evolution of Computer Training"*, Technological Horizons in Education Journal, 14 (3), pp.88-89
10. YG, CHIMEZIE A.B. OSIGWEH, *"Casing the Case Approach in Management Development"*, Journal of Management Development (UK), 8,2,1989, pp.41-49
11. KAKABADSE, A. AND EDWARDS, C., *"Managing Education at a Distance"*, paper presented to the United Nations Symposium on Management Training Programme and Methods, Implications of New Technologies, Geneva, 17-19 October 1987
12. KAKABADSE, A. AND EDWARDS, C., *op.cit*, pg 8
13. KAKABADSE, A. AND EDWARDS, C., *op.cit*, pg.7
14. KAKABADSE, A. AND EDWARDS, C., *op.cit*, pg.8
15. MYERS, A., ORAM, I., SWEENEY, M. AND WARR, A., *"Cranfield Executive MBAs: Education Through Micros"*, Conference of International Business Schools Computer Users Group (IBSCUG), Henley, UK, 29-31 March, 1989.
16. SILK, D.J., *"Information Management: The Henley-IBM Study Contract"*, International Journal of Information Management, 10, 1990, pp.14-34
17. DRUCKER, P.F., *"The Coming of the New Organization"*, Harvard Business Review, Jan-Feb, 1988, pp.45-53.

18. COULSON-THOMAS, C., *"Breaking Through the Information Barrier: Management Development and IT"*. Management Development Practice (Conference organised by CRAC, Shell, DTI and MCI (Management Charter Initiative), 2-3 October 1989.
19. COULSON-THOMAS, C., *op.cit*, pg.4.
20. FRAND, J.L. AND BRITT, J.A., *"Fifth Annual UCLA Survey of Business School Computer Usage"*, Communications of the ACM, Vol.32. No.1, January 1989.

Cranfield School of Management

Cranfield Institute of Technology
Cranfield Bedford MK43 0AL England
Telephone National Bedford (0234) 751122
International +44 234 751122
Telex 826559 CITMAN G
Telefax (0234) 751806



The Cranfield School of Management Working Papers Series has been running since 1987, with approximately 300 papers so far coming from the seven major academic subject areas of the School: Enterprise and Small Business Development in the UK and overseas; Finance, Accounting and Economics; Human Resources and Management Development; Information Systems Management; Marketing and Logistics; Operations and Project Management; and Strategic Management. In 1991, the School merged with the Cranfield School of Policy Studies, resulting in two new subject areas, the Social Policy faculty being reformed into the new Public Sector Management Group, and a Centre for Logistics and Transport Studies. From 1992, papers from all groups will be included in the Series. From 1992, papers are reviewed by senior members of faculty before acceptance into the Series.

For copies of papers (up to three free, then £2 per copy, cheques to be made payable to the Cranfield School of Management), please contact Mrs Val Singh, Research Administrator, at the above address.

February 1992

SCHOOL WORKING PAPER SERIES

List No 4, 1990

- | | |
|---|--|
| SWP 1/90 Sue Birley, David Norburn, Kingsley Manning
"Developing a New Ventures Strategy" | SWP 8/90 Sue Davison
"Cultural Mapping - What is it, and How does it relate to Previous Research?" |
| SWP 2/90 Sue Birley
"The Small and Medium-sized Enterprise - Is there a European Dimension?" | SWP 9/90 Andrew Myers, Ian Oram, Michael Sweeney, Alan Warr
"Managing Learning the Need to Change - Some General Findings from a Study of Applying Information Technology to Aid Learning in a Business School" |
| SWP 3/90 David Ballantyne
"Management of the Diagnostic Review Process in Service Quality Management: ANZ Bank - A Case Outline" | SWP 10/90 David Parker
"The Importance of Ownership" |
| SWP 4/90 David Ballantyne
"Turning the Wheel of Quality Improvement - Continuously" | SWP 11/90 John Hailey
"Financing Small Enterprise in Developing Ministates" |
| SWP 5/90 Bob Spink
"Overtime: The Problem that won't go away." | SWP 12/90 Malcolm Harper & John Hailey
"Management Development for Enterprise Promotion: NGOs and the Development of Income Generating Enterprise" |
| SWP 6/90 Sue Birley & Paul Westhead
"Growth and Performance Contrasts between Types of Small Firms" | SWP 13/90 John Grierson
"Sustainability, Self-Sufficiency and Management Simplicity" |
| SWP 7/90 David Parker
"The 1988 Local Government Act and Compulsory Competitive Tendering" | SWP 14/90 Sue Birley & Paul Westhead
"Private Business Sales Environments in the UK" |
| | SWP 15/90 Malcolm McDonald & Hugh Wilson
"State of the Art Developments in Expert Systems and Strategic Marketing Planning" |

- SWP 16/90 Yochanan Altman
"The Organisational Culture of the Armed Forces: The Case of the Israeli Army"
- SWP 17/90 Paul Burns
"Managing a Partnership for Business Success"
- SWP 18/90 Sue Birley & Paul Westhead
"Spatial Variations in Private Advertised Sales in the UK, 1983-1988"
- SWP 19/90 Keith Ward, Sri Srikanthan, Richard Neal
"Strategic Brand Accounting"
- SWP 20/90 Yochanan Altman
"The Relocations of Companies: The Human Resources Perspective"
- SWP 21/90 Sue Birley & Kingsley Manning
"Public Sector Venturing"
- SWP 22/90 Malcolm McDonald
"Marketing Technique Interrelationships and the Pursuit of Relevance in Marketing Theory"
- SWP 23/90 Sue Birley, Stan Cromie & Andrew Myers
"The Relationships between Incubator Experience Entrepreneurial Networks in Northern Ireland - Some initial findings."
- SWP 24/90 Sue Birley, Stan Cromie, & Andrew Myers
"Entrepreneurial Networks: Their Creation and Development in Different Countries"
- SWP 25/90 Sue Birley & Paul Westhead
"Discriminating Factors in the Strategic Profile of 'Small' and 'Large' Small Firms"
- SWP 26/90 Andy Bytheway
"Electronic Data Interchange: The Longer Term Effects on International Trade - A Selected Glossary of EDI Terms and Acronyms"
- SWP 27/90 Andy Bytheway
"Electronic Data Interchange: Technical Opportunity or Business Necessity?"
- SWP 28/90 Andy Bytheway & Chris Barrington-Brown
"Survey of Electronic Data - Interchange Users and Service Providers in the UK"
- SWP 29/90 Andy Bytheway
"An Update Report from the EDI 1989 Conference in London"
- SWP 30/90 Andy Bytheway
"Electronic Data Interchange and Advanced Information Processing - The Way Ahead"
- SWP 31/90 Andy Bytheway
"EDI Standards and the Single European Market"
- SWP 32/90 Andy Bytheway
"The Effects of EDI on the Financial Sector"
- SWP 33/90 Mike Sweeney & S Carter
"JIT (Just in time) Manufacturing - But at What Cost?"
- SWP 34/90 Mike Sweeney
"CIM (Computer Integrated Manufacture) - Buy Now or Pay Later"
- SWP 35/90 Paul Westhead
"Managing the Construction of a Manufacturing Establishment Data-Bank"
- SWP 36/90 Yochanan Altman
"The Role of Personal Social Support Networks in Soviet Type Centralised Command Economies: Social Networks at Work in Soviet Georgia"
- SWP 37/90 David Parker, Keith Hartley, & Stephen Martin
"Organisational Status, Ownership and Productivity"
- SWP 38/90 Mike Sweeney
"Breakthrough to World Class Manufacturing - A Strategy for the Transformation"
- SWP 39/90 Colin Armistead & Graham Clark
"After Sales Support Strategy"
- SWP 40/90 Colin Armistead
"Competitive Service Strategy and the Service Operations Task"
- SWP 41/90 Susan Segal-Horn & Heather Davison
"Global Markets, The Global Consumer and International Retailing"
- SWP 42/90 John Mcgee & Susan Segal-horn
"Strategic Space and Industry Dynamics"
- SWP 43/90 David Parker, Keith Hartley, & Stephen Martin
"Do Changes in Organisational Status Affect Financial Performance?"

SWP 44/90 Keith Ward, Sri Srikanthan, Richard Neal
"Life-Cycle Costing in the Financial
Evaluation and Control of Products and
Brands"

SWP 45/90 Adrian Payne, Deborah Walters & Gordon
Foxall
"A Study of the Cognitive Styles of Australian
Managers"

SWP 46/90 Graham Elkin
"Organisational Behaviour: People, Groups
and Organisations at Work"

SWP 47/90 Graham Elkin
"Physical Therapy and Management
Consulting"

SWP 48/90 Graham Elkin
"Executive Challenge: Using the Outdoors to
Develop the Personal Action Skills of MBA
Students"

SWP 49/90 Graham Elkin
"Career - A Changing Concept"

SWP 50/90 Graham Elkin
"Competency Based Human Resource
Development - Making Sense of the Ideas"

SWP 51/90 Graham Elkin
"The Admission of Mature Adult Students to
Executive MBA Programmes"

SWP 52/90 Graham Elkin
"Exploring the Environment, Discovering
Learning Resources and Creating Low Cost
Training & Development - Part 1"

SWP 53/90 Graham Elkin
"Exploring the Environment, Discovering
Learning Resources and Creating Low Cost
Training & Development - Part 2"

SWP 54/90 Kim James & Donna Lucas
"Managing Learning in an Organisation that
Understands Teaching"

SWP 55/90 Graham Elkin
"Eldercare: A Growing Issue for Employee
and Employer"

SWP 56/90 Robert Brown & Andy Burnett
"Graduate Enterprise Programme IV, 1990 -
Recruitment and Selection Report, East
Midlands Region"

SCHOOL WORKING PAPERS

LIST NO 5, 1991

SWP 1/91 Colin Barrow
"How Green are Small Companies? A Survey
by Cranfield School of Management"

SWP 2/91 Graham Clark
"Strategies for Product and Customer Support
- A Research Report"

SWP 3/91 David Parker
"Tackling Tax Evasion in the UK"

SWP 4/91 John McGee and Susan Segal-Horn
"Strategic Space and Industry Dynamics: The
Implications for International Marketing
Strategy"

SWP 5/91 Chris Brewster
"Culture: The International Dimension"

SWP 6/91 Chris Brewster and Helen Peck
"Management Changes in China and Eastern
Europe: Dubious Parallels"

SWP 7/91 Keith Ward, Sri Srikanthan, Richard Neal
"Marketing Investment Analysis: The Critical
Success Factors for Financially Evaluation and
Effectively Controlling Marketing Investment
Decisions."

SWP 8/91 Andy Bytheway and Bernard Dyer
"Electronic Data Interchange: Persuading
Senior Management"

SWP 9/91 Alan Warr
"Strategic Opportunities and Information
Systems Management"

SWP 10/91 Alan Warr
"Bridging the Gap - Implementing Information
Systems Strategies"

SWP 11/91 Alan Warr
"Mapping the Applications Portfolio onto the
Projects Portfolio"

SWP 12/91 Siobhan Alderson & Andrew Kakabadse
"The Top Executive Competencies Survey - A
Literature Review"

SWP 13/91 Mike Sweeney
"Determining a Technology Strategy for
Competitive Advantage"

- SWP 14/91 Len Holden and Helen Peck
"Bulgaria, Perestroika, Glasnost and Management"
- SWP 15/91 Robert Brown & Andy Burnett
"Do we need Enterprising Graduates?"
- SWP 16/91 Ian Oram & Clare Tagg
"Using an IS Strategic Model to give a Strategy for Teaching IS"
- SWP 17/91 Len Holden
"Employee Communications in Europe"
- SWP 18/91 Susan Segal-Horn
"The Globalisation of Service Industries"
- SWP 19/91 David Ballantyne
"Coming to Grips with Service Intangibles, using Quality Management Techniques"
- SWP 20/91 Colin Armistead
"Resource Productivity in the Services Sector"
- SWP 21/91 David Parker & John Burton
"Rolling back the State? : UK Tax and Government Spending Changes in the 1980s"
- SWP 22/91 Simon Knox & David Walker
"Involvement, Cognitive Structures and Brand Loyalty: The Empirical Foundations for a Unifying Theory"
- SWP 23/91 David Ballantyne
"Internal Marketing, Collaboration and Motivation in Service Quality Management"
- SWP 24/91 Chris Brewster
"Starting again: Industrial Relations in Czechoslovakia"
- SWP 25/91 Cliff Bowman & Gerry Johnson
"Surfacing Managerial Patterns of Competitive Strategy: Interventions in Strategy Debates"
- SWP 26/91 Malcolm Harper
"Cooperatives and Other Group Enterprises: What are the Critical Factors for Success? A Survey of Informed Opinion."
- SWP 27/91 Mike Sweeney
"The Strategic Management of Manufacturing: From Waste to Haste"
- SWP 28/91 Mike Sweeney
"How to Achieve Competitive Edge by Simultaneous Process Engineering"
- SWP 29/91 Mike Sweeney
"Towards a Unified Theory of Strategic Manufacturing Management"
- SWP 30/91 David Ballantyne, Martin Christopher & Adrian Payne
"The Pathology of Company-Wide Quality Initiatives: Seven Prescriptions for Failure"
- SWP 31/91 Martin Christopher, Adrian Payne & David Ballantyne
"Relationship Marketing: Bringing Quality, Customer Service and Marketing Together"
- SWP 32/91 Mike Fleming & Joe Nellis
"The Development of Standardised Indices for Measuring House Price Inflation Incorporating Physical and Locational Characteristics"
- SWP 33/91 Cliff Bowman
"Charting Competitive Strategy"
- SWP 34/91 Roland Calori, Gerry Johnson & Philippe Sarnin
"French and British Top Managers' Understanding of the Structure and the Dynamics of their Industries: A Cognitive Analysis and Comparison"
- SWP 35/91 Michael Sweeney
"Manufacturing-Led Competitiveness: Use Maths not Myths"
- SWP 36/91 Robert Brown, Andrew Norton & Bill O'Rourke
"Case Study - Beverley plc"
- SWP 37/91 Malcolm Harper & John Hailey
"Management Development for Enterprise Promotion: Non-Governmental Organisations and the Development of Income Generating Enterprise"
- SWP 38/91 Shaun Tyson & Noeleen Doherty
"The Redundant Executive: Personality and the Job Change Experience"
- SWP 39/91 Yochanan Altman
"On Managing Volunteers - Absence of Monetary Compensation and its Implication on Managing Voluntary Organisations: The Issues of Motivation, Control and Organisational Structure."
- SWP 40/91 David Parker
"Privatisation Ten Years On: A Critical Analysis of its Rationale and Results."

- SWP 41/91 Ian Oram
"Implications of an IS Strategic Model for IS Development"
- SWP 42/91 Shaun Tyson
"1992: An Investigation of Strategies for Management Development"
- SWP 43/91 Malcolm McDonald
"The Changing Face of Marketing"
- SWP 44/91 Malcolm McDonald
"Teaching by Degrees"
- SWP 45/91 Malcolm McDonald & John Leppard
"Marketing Planning and Corporate Culture"
- SWP 46/91 Colin Barrow & Andy Burnett
"The Single Market and Small Growing Companies in the UK: A Survey by Cranfield School of Management"
- SWP 47/91 Colin Barrow
"Key Staff Recruitment in Small Firms in the UK: A Survey by Cranfield School of Management"
- SWP 48/91 Yochanan Altman
"Organisational Consultancy and Clinical Psychology - The Meeting of Two Worlds"
- SWP 49/91 John Hailey & Jon Westborg
"A New Role for Development Agencies: Non-Government Organisations and Enterprise Development"
- SWP 50/91 Paul Burns & Christine Choisne
"The Attitudes of Small and Medium-Sized Companies in Britain and France to the Business Environment in the First Half of 1991"
- SWP 51/91 Paul Burns
"The European Market"
- SWP 52/91 Shailendra Vyakarnam
"The Mismatch between Academic and Practitioner Constructs of Ethics : Implications for Business Schools"
- SWP 53/91 Cliff Bowman
"Managerial Perceptions of Porter's Generic Strategies"
- SWP 54/91 Adrian Payne and Flemming Poufelt
"Increasing the Effectiveness of Mergers and Acquisitions within the Management Consulting Industry"
- SWP 55/91 John Hailey
"The Small Business Sector in Developing Economies"
- SWP 56/91 Colin Armistead & Graham Clark
"Capacity Management in Services and the Influence on Quality and Productivity Performance"
- SWP 57/91 Colin New
"World Class Manufacturing versus Strategic Trade Offs"
- SWP 58/91 Colin Armistead & John Mapes
"Supply Networks and the Changing Role of Operations Managers"
- SWP 59/91 Brett Collins & Adrian Payne
"Internal Services Marketing"
- SWP 60/91 Andrew Myers, Mairi Bryce & Andrew Kakabadse
"Business Success and 1992: The Need for Effective Top Teams"
- SWP 61/91 Malcolm McDonald
"Strategic Marketing Planning: A State of the Art Review"
- SWP 62/91 Malcolm McDonald
"Excellent Selling can Seriously Damage a Company's Health"
- SWP 63/91 Graham Clark & Colin Armistead
"After Sales Support Strategy: A Research Agenda"
- SWP 64/91 Graham Clark & Colin Armistead
"Barriers to Service Quality: The Capacity, Quality, Productivity Balance"
- SWP 65/91 Ariane Hegewisch
"European Comparisons in Rewards Policies: The Findings of the First Price Waterhouse/Cranfield Survey"
- SWP 66/91 Andy Bailey & Gerry Johnson
"Perspectives of the Process of Strategic Decision-Making"
- SWP 67/91 Collin Randlesome
"East German Managers - From Karl Marx to Adam Smith?"
- SWP 68/91 Paul Burns & Christine Choisne
"High Performance SMEs: A Two Country Study"

- SWP 69/91 David Parker
"Ownership, Managerial Changes and Performance"
- SWP 70/91 Graham Elkin (Visiting Fellow)
"Socialisation and Executive MBA Programmes"
- SWP 71/91 Shai Vyakarnam
"The New Europe from the Third World"
- SWP 72/91 John Hailey
"Small Business Development in the Developing World: An Overview of Contemporary Issues in Enterprise Development"
- SWP 73/91 Paul Burns
"Training Within Small Firms"
- SWP 74/91 Paul Burns & Christine Choisne
"High Performance SMEs in Britain and France: Strategies and Structures"
- SWP 75/91 Robert Brown et al
"UK Tax Implications for the Small Business"

SCHOOL WORKING PAPERS

LIST NO 6, 1992

- SWP 1/92 Mike Sweeney
"How to perform simultaneous process engineering"
- SWP 2/92 Paul Burns
"The Management of General Practice"
- SWP 3/92 Paul Burns
"Management in General Practice: A Selection of Articles"
- SWP 4/92 Simon Knox & David Walker
"Consumer involvement with grocery brands"
- SWP 5/92 Deborah Helman and Adrian Payne
"Internal marketing: myth versus reality?"
- SWP 6/92 Simon Knox & Leslie de Chernatony
"Brand price recall and the implications for pricing research"