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**A STUDY OF THE EXPECTATION OF FEMALE STUDENTS FOLLOWING A
TECHNICALLY ORIENTED DEGREE COURSE IN HONG KONG**

by

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Abstract

In the past, professional women have tended to choose careers biased towards social and non-technological areas. Comparatively very few women chose technically-related employment. There is evidence, however, that this situation is changing, especially in the information technology (IT) industry. This study, aimed at female undergraduates, sets out to investigate their expectations and motives for enrolling in Information Systems (IS) and Computer Science (CS) degree courses. There are, for instance, more female students enrolled in IS than in CS. The paper examines reasons for this and other related issues. Furthermore, the study investigates the students' emerging career expectations as they approach graduation. Among other conclusions, the study finds that the IS students, in particular, have career expectations that are more oriented towards managerial, organizational and social aspects of IT rather than narrower technological interests.

Introduction

Sexual stereotypes still exist in our society in the 1990s. It is a general belief that males will do technical jobs, while females will perform clerical duties. Popular prejudice keeps women away from science and engineering; the conditioning starts with the toys given to children and continues all the way through schools [7]. Women are said to be more interested in jobs related to social and non-technical areas, major effort has to be expended to recruit, train and retain women in disciplines and careers of science and engineering [1,2,3]. However, the emergence of the new information technology (IT) industry, coupled with the shortage of skilled personnel in the high-technology area, suggest that future IT professionals will increasingly come from the ranks of women [4,5]. Empirical evidence also suggests that women in the 1990s expect self-determination, financial independence and challenges in their careers. Moreover, they are better prepared to enter into the profession of science and technology [6,8].

The Bachelor of Arts (Honours) in Information Systems (BAIS) degree at the City Polytechnic of Hong Kong (CPHK) has produced its first batch of graduates in June 1994. Of this first cohort of 85 students, almost half the number are female students. An interview was conducted with a number of these female students 2 years ago, to investigate the reasons for their entering and their expectation of the course [12]. Now in their final year, these students have been interviewed again in a longitudinal study to investigate any changes to their ideas about the course, as well as their emerging career expectations. This paper sets out to examine the major factors, whether it is the academic environment, family circumstances or other external impacts, which may influence female students initially in their choice of the course and subsequently in the choice of careers. Furthermore, a group of final year female students doing the Bachelor of Science (Honours) in Computer Science (BScCS) have also been interviewed to provide data for comparison between two seemingly similar, but in reality very different types of degree courses. It is hoped that this study will provide some insights into the education needs and career prospects for females in a degree course with a significant technical component.

The Interviews with the BAIS students

The BAIS programme, which began in September 1991, now has its full complement of three years of undergraduate students. In June 1994, it produced its first batch of graduates. In 1991, a sample of ten females from the first cohort of first year students were interviewed to assess students' view. Recently, these students were interviewed

again to provide data for a longitudinal study and to assess their emerging career expectations.

In general, in this first cohort, the female students expected and found the course to be a mixture of computer concepts and business theories applied to organisational functions. They welcomed the high proportion of business, economics and accounting components mingled with the computer science concepts. They all agreed that working together as a team, or in formal group work, has been one of the most important and beneficial aspects of their tertiary educational training. Indeed, when the original BAIS course planning team interviewed potential local employers of the future BAIS graduates in 1990, it was precisely this *team* nature of work that was cited as being important.

Most of the students established links between the IS core subjects and other supporting subjects, with business studies perceived as having the strongest tie. The pattern found was that the IS module introduced a technique or model for a particular condition, and a supporting module dealt with the technique in detail. This helped students to understand why these modules were grouped together, and encouraged and strengthened their ideas of relationships and interconnections between modules. Many students admitted that when they first started their course they described it as "some kind of computer science". Now, encouragingly, the students are confident with the term "Information Systems" to the extent that they can explain to family and friends about their present studies and prospective careers. This in itself is viewed as a major achievement on their part.

From the students' own perceptions, their knowledge of IS increased over the years. They became aware of information flow, the arrangement of people, procedures and machines, i.e. the information systems in organisations, in their routine encounters with organisations such as banks or government departments. Students who had relevant IS employment during their summer vacation emphasised categorically that materials taught in the course are very appropriate and relevant in their jobs, and that they see themselves and are perceived by their working colleagues as the bridging persons between technology and business. Furthermore, the realisation that IS is a multi-disciplinary subject, that it covers such diverse areas as business, economics, accounting, psychology, ethics, law, strategic management, computer science and mathematics, gives students new insights into their future career plans. In fact, some do now understand the advantages envisaged by the original course planning team that they will have over mainstream computer science or business graduates when they go job hunting, in that there are more avenues open to them and they have a wider spectrum of skills to build upon.

The Interview with the BScCS students

A group of final year BScCS female students were also interviewed to provide data for comparison. Out of a class of 80 students, only seven of them are female. Four of these female students chose the elective, Information Systems Audit (IS Audit), offered by the Department of Information Systems. Thus these students were invited to participate in the interview.

The course BScCS is run as a sandwich programme. Students spend their third year of study working in industry. Therefore, this group of final year students actually registered one year before the BAIS students. That is, when they chose their degree course to study, BAIS was not yet in place. Before they embarked on the computer science degree course, they did not understand the term "information systems", thus a degree course in information systems, even if it were available then, would not be their choice. The term "information systems" became more apparent as they progressed in their course. They understand it as "some kind of business course with computers", thus thinking that it is entirely non-technical. These students chose to study computer science because they perceived that it would not be as technical a course as information technology which they thought would emphasise telecommunication aspects.

They expected and found the course of computer science to be "semi-technical"; thus, there are no surprises in the curriculum and they like the course in general. There is a simple and practical reason for choosing IS Audit as their elective: IS Audit is non-technical, hence it is an easy option in their hectic final year schedule. All of these female students want to be computer programmers in their initial careers. They hope that as they progress, they can be promoted along a technical career path, rather than having to switch into managerial roles for career advancement. We recognise that there is a marked difference in intake of female students by percentage between the BAIS and BScCS courses. Consequently further research into the differences expressed by students of these two courses needs to be undertaken before we can develop stronger theories about the rationale behind their course selection and career prospects.

Discussions and Conclusions

In Hong Kong, there is a shortage of tertiary education places and so competition to get into a degree course is very fierce. Students very often select their courses according to their perceived chances of being admitted. Hence, they may enter a course without really

finding out or knowing what the course is about. Consequently, their initial expectations and the actual course curriculum may be very different indeed. It is thus interesting that both the IS and the CS female students' expectations of the courses match with the actual course materials. It may well be due to the fact that for females to choose a seemingly technical course, they would need to spend more time finding out what the course is about, and whether they would like it and be successful in the course [1].

Sexual stereotypes still exist to a certain extent in Hong Kong, though this is perhaps less true for the younger generation where more tolerant attitudes prevail. {citation}. Generally speaking, males have been expected to take up technical jobs, while females will carry out office duties. Correspondingly, boys choose science subjects in school while girls choose arts ones. Thus these students, in choosing either IS or CS as their studies, are breaking the traditional mould they are expected to be in. They may have been encouraged by the opportunities the IT industry presents, hence foreseeing the rewards for their interest in and mastery of technology [9]. Interesting enough, neither group mentioned any significant impact or pressure from their families. For the majority, their families were so pleased that they could get into tertiary education that they were given a free hand with their choice of courses.

There are more girls enrolled in IS than in CS. In a class of 85 in IS, some 33 (i.e. 38%) are girls, whereas out of a class of 80 in CS, only seven (9%) are girls. Since IS is perceived as being a less technical subject than CS, this confirms research findings that it is more difficult to recruit women into programmes of science and engineering [2,3,10]. Although the IT industry as a whole does not have a plethora of female role models, pioneers and mentors [11], the fact that IS is perceived as less technical is enough to attract more females into the programme. This is evidenced by the fact that the BAIS is the second most popular course in CPHK, with 42 applicants competing for each place.

There is a distinct difference in the choice of initial careers between the two groups. The expected advancement in their respective careers is also different. The IS students' career expectations are very diverse. They are prepared to enter into all areas of IT, with managerial, organisational and social aspects being the most popular. The CS students, on the other hand, want to be straight forward computer programmers. The difference in emphasis of the two courses may have played a substantial part in influencing their choice of careers. While the CS course has a traditional computer science curriculum, the IS course is designed to produce graduates who have technical know-how and business acumen, the new hybrid of computer/business designers [12]. All in all, the desire of both

groups of students to succeed in their chosen courses, and subsequently in their chosen careers, comes across most empathically and determinedly.

This is by no means the end of the road for research into female student attitudes with regard to course selection and career prospects. As indicated above, there is a need for continued research into the differences in attitudes expressed between CS and IS students. This should be in the context of a continua of longitudinal studies, where the opinions of successive intakes of students are considered. This will enable us to build up a longitudinal profile of female students' attitudes in Hong Kong, and, equally importantly, to plot any changes that appear to be taking place. We will, for instance, be able to see if IS remains as popular with female students as it is today, and whether there is a long term shift away from CS towards IS for female students. Ideally, we will also be able to interview our IS graduates five, ten and twenty years down the line into their careers to investigate whether their IS skills have stood them in good stead and they have succeeded where we have intended them to succeed - in the previously male-dominated realms of corporate business and management. The female BAIS graduates of today may yet be the role models of tomorrow.

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