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28. An Evaluation of Information Systems Course: A Reflection from Final Year Students

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Abstract

Due to the importance of Information Technology (IT), various IT courses have been introduced in the last few decades. However, there has been a steady decline in the student enrolment in various IT related courses around the globe after the economy downturn in the early 2000. While some studies have been conducted to investigate the relevance of IT/IS courses for the current market situation, there is still a lack of studies that assess students' perception regarding the ability of existing IT/IS courses in preparing students for their IT/IS career. This study evaluates the Bachelor of Information Systems (BIS) course offered at one of the leading Universities in Australia by gathering opinions and reflections from students at the final year through a combination of qualitative and quantitative studies. The findings highlights a number of critical skills expected of IS professionals and a number of opportunities for further improving the course.

Keywords: IS Relevance, IS Skills, IS Course Evaluation

Introduction

Information Technology (IT) has become an important element in everyday life for individuals and businesses. It has changed the way people live and interact with each other as well as the way organisations carry out their business operations (Lee et al. 2001; Lee 2005). Many novel ways of delivering services and conducting business have been made possible with the advances in IT, including the use of Automatic Teller Machine (ATM), electronic mail, distance education, and online shopping, to name a few. IT has also played a major role in the national economic and productivity growth and, hence, has been increasingly incorporated in many aspects of business and government operations (Australian Government 2006).

Due to the importance of IT to the community, there have been a number of disciplines offered at the Universities and other tertiary education to study some aspects of IT in the last few decades. Each of these IT related discipline has a different context. Computer engineering, for example, deals with building computer hardware, while computer science is concerned with developing software applications / computer programs. Information Systems pertains to the study of the use of technology by organisations and individuals, while the context of software engineering is within the development of large scale software systems such as large inter-organisational systems (Yen et al. 2001; Andriole 2006).

Technologies have advanced rapidly with significant improvement in cost, performance, storage capacity, input/output devices, networks, programming languages as well as tools and methodology for systems development (Lee et al. 2001). In addition, the business environment has changed due to various factors including the availability of technologies, the increasing performance of technologies, the decreasing costs of technologies, the rising competition and the needs for organisations to gain strategic value of technologies (Carr

2003). As a result, the skills and expertise required for developing and managing IT within organisations and wider community have also changed over time (Todd et al. 1995; Noll and Wilkins 2002). To meet all these changing needs, the IT related curricula offered at the University, require constant update to ensure that they are still relevant to the business needs (Lee et al. 2001; Noll and Wilkins 2002).

A number of previous studies (see for example Lee et al. 2001; Petrova and Claxton 2005; Andriole 2006) indicate that there is usually a mismatch between what is expected of the industries in terms of the IT skills required and the curricula offered at the University. It is believed that academics are generally slow in responding to the current industry demands and needs due to a lack of driving forces in updating and revising the curricula. In addition, academic programs are generally too theoretical and lack of practical exercises. As a result, the IT graduates often lack the skills and capabilities required by the industry (Trauth et al. 1993; Petrova and Claxton 2005; Sutcliffe et al. 2005).

In addition to the changing nature of the IT field, additional pressure has been laid upon the academics within this field due to the significant reduction in the student enrolment for IT related disciplines around the world (Lee et al.2001; Lee 2005). The declining economy towards the end of 1990s and the outsourcing trend to reduce the IT spending of organisations seem to have reduced job opportunities for IT graduates (Fang et al. 2004; Sutcliffe et al. 2005). All these issues appear to have exacerbated the conception that IT courses are generally unable to prepare graduates with the skills and knowledge expected by the industries, leading to the decline in the student enrolment in the last few years.

While there have been some studies (for example, Leitheiser 1992; Lee et al. 2001; Yen et al. 2001; Ehie 2002; Miller and Luse 2004)) exploring the skills and knowledge demanded by the industries to better align IT curricula with the market demand by taking the input from the practitioners and academic, there is still a lack of studies that take into account input from students (Petrova and Claxton 2005). In fact, inputs from students are also important in assessing the effectiveness of IT courses in the development of the expected skills. Built upon the existing studies, this study evaluates the Bachelor of Information Systems (BIS) course offered at the University under study by gathering opinions and reflections from students at the final year. In particular, there are two objectives of the study: 1) to evaluate how well the BIS course at the University under study is in developing the skills/knowledge expected of IS professionals and, 2) to identify possible ways for improving the BIS course in order to better meet the industry expectations.

In achieving the objectives of this study, the following research questions are addressed:

1. What are current skills/knowledge expected of IS professionals?
2. How confident/satisfied are students with these skills after undertaking the BIS course?
3. What aspects of the BIS course that need improvement to allow students to better develop the expected skills?

For the purpose of the study, a literature review was first conducted to identify the current skill sets expected of IS professionals. Then interviews were conducted with 10 students from the Bachelor of IS (BIS) course at the University under study who were in their final year to assess their perception of the course. Some ways to improve the BIS program were also identified. Finally, a survey of how well the BIS program facilitated the development of important IS skills was also conducted to obtain more generalizable results that complement the richness of the interview findings.

The findings indicate a combination of business and technological skills are expected of IS professionals. In addition, 'soft skills' including interpersonal and communication skills are highly regarded by the employers. The BIS has been aware of the importance of these soft skills and has developed students' skill in this respect satisfactorily. Although opportunities for improvement have been identified in some areas particularly group work, assessment and elective subjects offering, the study shows that in general students are satisfied with the development of critical skills expected of IS professionals.

By exploring the perception of final year students of their preparedness for the workforce through the BIS course and ways to improve the course, this study will be valuable to the University under study. This understanding is particularly important as the University under study is working towards a new model and, therefore, significant changes to the structures of many existing courses are expected. Although the BIS course has been regularly revised and improved since it was established in 1996, no systematic evaluation has been performed to assess the perception of BIS graduates regarding their preparedness for the workforce. With a better understanding of the value of the BIS course in preparing students for the workplace and possible ways to improve it, the course can be better designed within the new model to ensure the effectiveness of the course in producing IS professionals which are expected and demanded by the marketplace. The insights obtained from this study will also be valuable for other Universities offering IS course.

In the next section, a literature review of the issues in the IT/IS field, including the identification of the skills and knowledge expected of IS professionals, is presented. Then an overview of the BIS course at the University under study is outlined, followed by the research design and the discussion of the findings. Finally, the conclusion section highlights some ways to improve the BIS and describes some limitations of the study as well as possible future studies.

Literature Review

Due to dot.com crashes in 2000 and the economy downturn in the early 2000s, many organizations around the world have reduced their IT budget. Consequently, organizations tend to outsource their IT activities to other countries with low cost labour (Fang et al. 2004). In addition, organizations are forced to recruit IS staff with related working experience to minimize the risk of project failure and the training costs (Sutcliffe et al. 2005). Furthermore, IS professionals are often expected to be flexible and capable of mastering new skills and, therefore, can handle multiple roles (Sutcliffe et al. 2005). This presents a challenge for IS graduates in obtaining a job upon graduation. Not surprisingly, there has been a steady decline in the student enrolment in various IT related courses around the globe since 2002 (Andriole 2006).

In Australia, all Universities in various States have also experienced a significant decrease in the IT student enrolment. In Victoria, for example, Monash University experienced a decrease of almost 48% for the period between 2001 and 2006. The University of Melbourne experienced a decline of about 28% between 2001 and 2005, while Swinburne University experienced a drop of about 25% for the same period of time (Australian Government 2006). Some reasons for the significant decline of student enrolment in IT courses were identified and discussed at the national ICT Skills Summit in Brisbane in June 2006 (Queensland Government 2006a). Firstly, it appears that there is a negative perception of IT careers by many individuals, including students and their parents. They believe that IT jobs involve working in the backroom with no interaction with people and, therefore, IT professional tend

to have poor communication skills. In addition, many people are only aware of the failure cases of IT projects and have made them think that IT career is not promising. Moreover, there is a misconception that employers are typically not committed to training and developing IT staff and, hence, there is no clear career pathway for IT professionals and there are limited promotion opportunities. Furthermore, a study conducted by Multimedia Victoria in 2004 indicates that about 50% of the IT students surveyed found their course boring and about 80% had no clear understanding about the IT career opportunities (Queensland Government 2006a).

While the job market was down in 2002 compared to 2000, there is evidence that IS professionals are still demanded (Davis 2003). In Australia, IT market has been growing rapidly in the last few years (Douglas 2006; Mills 2006). Organizations continue to spend a significant amount of dollars for IT to maintain and improve productivity because their business operations rely heavily on technologies (Carr 2003; Davis 2003). As technologies become a commodity product which is available to all due to the decrease in price and improvement in performance, organizations need to actively seek ways and strategies to gain competitive advantage through differentiation by exploiting the available technologies (Carr 2003). Therefore they are willing to pay a high salary for those IS professionals with skills that are in short supply but high in demand (Davis 2003).

The decline in IT student enrolment in the last few years has led to shortages in skilled IT personnel globally. In Australia, the IT skills shortages have been a major concern because IT is one of the major drivers for the economic growth in Australia (Australian Government 2006). Various efforts have been put by Government, Industries, and Universities to address Australia's IT skills needs. For example, the National ICT Skills Summit was hosted by the Queensland Government in June 2006 to discuss the issues of ICT skills shortages and the way to move forward, the ICT Skills Formation Strategy project was initiated by the Department of Employment and Training and the Department of State Development, Trade and Innovation to work on the alignment of skills supply, workforce development and business strategy and the ICT Skills Foresighting Working Group was formed in February 2005 to analyse the current trends in ICT, their potential development, their applications as well as the implications for the ICT workforce and skills development (Queensland Government 2006b).

To address the issues of IT skills shortages and the misconception about the nature of IT professions, the role of education is recognized by many parties including governments, industries, employers and professional associations (Australian Government 2006). Specifically, Universities are expected to take the major role in developing the IT skills demanded by the industries. The IT curricula at Universities, therefore, need to be continually evaluated and revised to ensure that the programs still reflect the demands of the marketplace (Noll and Wilkins 2002). Thus, academics need to identify technology trends, business trends, learn the skills to teach these technologies and incorporate them into the curriculum (Davis 2003). It is believed that a good mixture of technology and business knowledge is important for IS professionals for their long-term career prospects (Douglas 2006).

However, the changing nature of the IT discipline due to ongoing development has created challenges. It typically takes a few years to develop a new curriculum and, therefore, it is difficult for academics to teach short-term, specific skills that are highly demanded at a certain time to students as these skills may become obsolete when the curriculum is ready. Universities typically help IT students develop the foundations that will be necessary for them

to they enter the workplace. Using these foundations, they are expected to build more specialized skills easily through their future job (Australian Government 2006).

There are a number of existing studies that identify critical skills of IS professionals and, therefore, need to be built into the IS curriculum. For example, Noll and Wilkins (2002) identified business knowledge as one of the most important skills that IS professional should possess and it includes knowledge of business functions, ability to interpret business problems and develop appropriate technical solutions, and ability to understand the business environment. In addition, some knowledge such as the ability to work collaboratively in a team project environment, ability to develop and deliver effective, informative and persuasive presentations, ability to plan, organize and lead projects and ability to plan, organize and write technical manuals, documentations and reports are also considered as business knowledge by Noll and Wilkins (2002), but are categorized as interpersonal skills or communication skills in some other studies (Leitheiser 1992; Miller and Luse 2004; Lee 2005).

Technical knowledge/skills which are also important for IS professionals including data and process modelling for system analysis and design, programming, database development, information systems planning, management and evaluation and information access and security (Trauth et al. 1993; Noll and Wilkins 2002). The importance of soft skills that include teamwork and collaboration, planning and leading projects as well as presentation and writing skills for IS profession is also recognized in many studies (Yen et al. 2001; Maier et al. 1998; Lee 2005). Closely related to soft skills, Yen et al. (2001) also identified creative thinking, problem solving skills, critical thinking and personal motivation as important personal traits / competencies that IS professional should possess.

Based on various studies identified from leading journals related to IT/IS education and IT/IS issues, the Appendix table summarizes the critical IS professional skills which are expected to be developed at the Universities. The soft skills particularly interpersonal skills and communication skills are valued more highly by employers than technical-oriented skills since it is more difficult to train new hired graduates on interpersonal and communication skills than on technical skills (Ehie 2002). With effective communication and interpersonal skills, IS students should therefore enhance their chance to be employed and reduce the risk of project failure (Miller and Luse 2004).

BIS at the University under study

Currently, the Bachelor of IS (BIS) course consists of 15 core subjects that all students must complete. In addition, there are two elective subjects offered at the second year level and seven elective subjects at third year level. At each level, there is a mixture of technical and business oriented subjects offered as either core or elective IS subjects. One of the core subjects at the third year level is Industrial Project, where students work in a group of five for a real business client. The work typically involves a development of a small application system and it is believed that by completing this subject, students can better appreciate what they have learned during the course. Nevertheless, through all core subjects, students are expected to develop those IS professional skills.

To further assist students in developing their interpersonal skills, a special program called Professional Skills Program (PSP) was also available to students. This course consists of three subjects to be completed over three semesters, and each subject has one-hour class per week. The three subjects include Business Communication, Teamwork Skills and Workplace Transition. Participation in this program is not compulsory and at the end of program, students will obtain a certificate. All the skills taught in the PSP are those demanded and

looked for by employers which include team work, presentation skills, communication, leadership, problem solving and analysis (Department of Information Systems 2006).

Research Design

For the purpose of this study, a literature review of issues related to the Information Systems (IS) discipline including skills expected of IS professionals was conducted. The first research question posed in this study was mainly answered through the literature review. The skills identified were then verified during the empirical study. The empirical study consists of two phases: the qualitative study and the quantitative study. Each of these is described below.

The Qualitative Study

The qualitative study involves interviews with 10 students who were enrolled in the Industrial Project subject of the Bachelor of Information Systems (BIS) of the University under study to assess their perception of the BIS course at the University under study in developing the required IS professional skills. Table 1 provides a brief profile of the interviewees.

Table 1. The Profile of the Interviewees

Case	Degree	Average Mark (IS)	IS Related Work Experience
1	BIS	65-69	IT internship with Asia Link
2	BIS/Commerce	70-74	No
3	BIS/Law	80-100	Computer network at a Law firm, DIS Help Desk
4	BIS/Science	65-69	No
5	BIS	70-75	No
6	BIS/Commerce	80-100	No
7	BIS/Commerce	70-74	No
8	BIS	70-74	System administrator
9	BIS/Commerce	76-79	No
10	BIS/Commerce	80-100	No

Each interview lasted between 45 minutes to an hour and was recorded and transcribed for analysis. During the interviews, students were also asked about the IS skills they believed were currently demanded based on their experience in searching for a job or/and during the interviews with prospective employers. Their opinions were used to refine the list of skills initially identified from the literature. The interview data was analysed using the qualitative data analysis (Miles and Huberman 1994; Neuman 2006). Firstly data reduction was achieved through open coding and axial coding to identify important themes/concepts and to establish the relationship among these themes using the first few interview transcripts. Then selective coding was performed to the rest of the interview transcripts to further support the themes obtained from the previous interviews. Through the interviews, some areas for improving the BIS program (*research question 3*) were also identified.

The Quantitative Study

Following the interviews, a quantitative study involving a survey of how well the BIS program facilitated the development of the important IS skills based on students' perception (*research question 2*) was administered among students in their final year to obtain more generalizable results that complement the richness of the interview findings. The interviews also served as a pilot test of the survey questionnaire. The survey was conducted during a lecture of one of the core third year subjects. There were 170 students enrolled, but there were only about fifty students attending the lecture during the survey administration. The attendance rate typically drops towards the end of the semester as students are normally

overwhelmed with many assignments. Not all students enrolled in this subject have done the Industrial Project subject. Forty nine students were given the survey, but only 45 responses could be used for the data analysis due to incomplete responses with four of the returned survey questionnaires. Table 2 shows the profile of the survey participants. Almost half of the respondents are doing BIS/Commerce degree, while 38% are doing BIS only. The table also shows that 59% of the respondents have an average mark of 70 and above, and the majority of the respondents do not have any IS related working experience.

Table 2. The Profile of the Survey Participants (n=45)

		Frequency	Percent
Course	BIS	17	38
	BIS/Commerce	22	49
	BIS/Other	2	4
	BIS/Science	4	9
IS Marks	Missing value	2	4
	50-54	1	2
	55-59	2	4
	60-64	5	11
	65-69	8	18
	70-74	11	24
	75-79	10	22
	80-100	6	13
Work Experience	No	35	78
	Yes	10	22
Gender	Female	25	56
	Male	20	44

The survey questionnaire was designed based on the results of the literature review and the qualitative study. For the survey data analysis, statistical techniques such as frequencies and means of responses were employed. One-sample t-test was also carried out to test whether the means of the responses regarding students' satisfaction with various skills, based on a five-point scale (1-very unsatisfied to 5-very satisfied), differ significantly from the expected value of 3.5. The test value was chosen based on the DIS Operational Plan 2006 (Department of Information Systems 2006) on Teaching and Learning that considers teaching evaluation with a mean score under 3.3 (using the same five-point scale) should be reduced. Thus, in this study, students are considered satisfied with a particular skill if the mean score is 3.5. Lower test value (such as 3.3) was not considered because less useful observations would be obtained and, hence, limited areas for improvements could be identified. Likewise, the test value was not set higher than 3.5 to avoid unrealistic expectations. The consistent observations obtained from the analyses of the quantitative data and qualitative data confirm the appropriateness of the chosen test value. Two-tailed test of significance was used instead of one-tailed test, because in addition to identifying skills that were rated below expectation, the study would also like to identify those skills that were rated highly by students. By combining the qualitative and quantitative studies as a way of triangulation, the generalizability of the findings as well as the understanding of students' perception regarding their IS skills development can be maximised in this study.

The Study Findings

Students perceptions regarding how well they believe they have developed the critical IS skills during their study are discussed based on the results of the survey and the interviews. In the discussion, some opportunities for improving the BIS program are highlighted. The survey results indicate that in general students are satisfied with the skills they developed during their study. The Appendix shows the mean of responses for each skill listed and the results of the one sample t-test. Table 3 depicts the mean of responses for each skill category.

The results suggest that students are least satisfied with their technical skills. For most of the technical skills listed, except for “Telecommunication and Networks” and “Concept of Client-Server and Distributed System Architecture”, the mean score is lower than the expected score of 3.5, although none of the differences is statistically significant. In particular, students are not satisfied with their skills in “Database Development” and “Systems Analysis and Design”. There is, however, no strong evidence from the interviews that can explain the observations obtained from the survey regarding students’ dissatisfaction with their skills in these two areas. By contrast, some students particularly expressed their satisfaction with their modelling experience learned in various subjects including Database Concepts and Systems Analysis and Design and they believed these skills would be very useful for their career. This issue deserves further investigation to ensure that BIS students are given enough exposure and opportunity to develop their skills in database development and systems analysis and design.

Table 3. The Mean of Responses for Each Category Skill

Skill Category	Means
Business knowledge	3.64
Technical knowledge	3.40
Management skills	3.50
Written communication skills	3.67
Oral communication skills	3.70
Interpersonal Skills	3.89
Personal competencies	3.68

Other survey observations regarding students’ satisfaction with technical skills are consistent with the interview findings. Although most of the participants seem to be satisfied with their technical skills developed during their study, they believe extensive training will be required in the future to do technical work, such as programming. However, with the foundation they have developed, most of them are confident that they can learn easily in the future. Furthermore, the choice of programming language for the course (Java) is considered good and useful by students as students are aware that it is the common language used in the industry. In addition, a number of students also indicate the need for more assistance for most of the technical work involved in the course as some of them feel that they were left alone most of the time and there was a lack of guidance in developing the required skills.

In terms of business knowledge, the survey indicates that students believe BIS has developed their skills in this area well. Most of the business skills listed in the Appendix have a mean score of higher than 3.5, except for the knowledge in outsourcing (mean score = 3.289) but the difference between this mean score and the expected value of 3.5 is not statistically significant. Students are very satisfied with their knowledge in “Understanding of Organization’s Culture” and “Organizational Change Management” with mean scores of 3.778 and 3.889, respectively, and these values are significantly higher than the expected value at 5% and 1% levels (see the Appendix). The qualitative data also support the survey observations in this respect as students generally feel that the BIS helps them develop the necessary business skills expected of IS professionals.

For management skills, the mean score for each related skill indicated in the survey findings is very close to the expected value of 3.5, except for “Monitoring and Controlling” and “Time Management”. From the interviews, it was discovered that some students did not realize that time management skill was expected to be built during their study through completing various assignments and other activities. A number of them did not make use of the opportunities to develop this skill during their course as they tended to leave their assignment and their study till the due date was approaching. Moreover, some students felt that they did not have enough

opportunity to develop the skill for monitoring and controlling because normally this opportunity was only given to the group leaders.

In addition, students seem to be satisfied with their written and oral communication skills. Specifically, students are very confident with their ability to adapt material to the reader and to develop and deliver effective, informative and persuasive presentations, with mean values of 3.822 and 3.746, respectively. These mean values are higher than 3.5 and it is statistically significant at 5% level. From the interview, it appears that students recognized the importance of communication skills for their career, as expressed below:

“I have seen people with pretty average marks with good communication skills getting good jobs. After you get your interview your marks are not going to help you at all. If you have marks more than 65%, then you are in the same boat, and it all comes down to communication skills to advance forward and get the job.” (Case 10)

Although not supported by the survey findings, the same student also claimed that there were many BIS students with poor communication skills which were probably because they were international students. The student, however, feels that BIS has made good effort in developing students' communication skills through various presentations and group work. However, to make the effort more effective, students also need to be made aware of the importance of having good communication skills for the future career and, therefore, should make use of the opportunities offered during the course.

Consistent with the nature of the BIS course that involves many group assignments, the survey suggests that students are particularly confident with their interpersonal skills with an average mean score of 3.89, as depicted in Table 4. All of the skills listed under this category, except for the “Ability to Teach Others” have mean scores of higher than the expected value with two of them are statistically significant at 1% level and one is at 5% level (see Appendix). Students with some experience in job interviews recognized that besides communication skills, potential employers also look for people with good interpersonal skills who are able to work in a teamwork environment. Therefore, the qualitative data also show that although some students found group work difficult and did not enjoy it during the course, they were grateful that they were exposed to lots of group work experience and learned how to handle group work issues along the way.

Specifically, some students interviewed feel that as third year students, they have gained more experience in group work and better appreciate the value of group work compared to when they were in the first or second years. Consequently students in the later year of their study also have experienced fewer problems with group work than those in the earlier years as most students have learned how to deal with group work and have become more responsible for their work, as expressed below:

“ compared to how I approached a team-work in first year to now, it's really different. I've learned not to dive straight into, but talking to people first. I think that's something you don't think of in 1st year. Then, you kind of think what you have to do for the assignment. Now, there is more sort of communication within the team.....I think everybody has grown up. The group issues [unfair distribution of work or people don't want to cooperate] mainly happened in the first and second years, but not too often. Definitely, when we get to the third year, I haven't had any problem. Everybody takes charge of their work.” (Case 2)

Finally, in terms of the personal competencies, students are generally satisfied with the various skills listed in this category, specifically with their analytical and critical thinking ability and their loyalty and commitment to the work. The mean scores for both of these skills are both 3.80 and are significantly higher than 3.5 at 1% and 5% levels, respectively. One area that students seem to lack confidence in is their ability to think creatively. One of the interviews reveals that creative thinking was not very well addressed during the course except when they were challenged to come up with a new business idea as part of an exercise in creating a business plan. Nevertheless, both quantitative and qualitative data suggest that the BIS has developed students' personal competencies satisfactorily.

In terms of the overall students' satisfaction with the BIS, the study suggests that students are generally satisfied with their learning experience. The survey result of the overall satisfaction yields a mean score of 3.614. In addition, during the interviews, when students were asked to rate their satisfaction level with BIS based on a five-point scale (1-very unsatisfied to 5-very satisfied), most students (8) rated their satisfaction as 4, one student rated 3.5 and one student rated 3. The following interview excerpts show students' overall perception of BIS:

"... It is really good. Just to learn from IS specific to how business works, how technology works and how to apply technology in a business setting. But I wouldn't say 5 because sometimes I don't feel like I am overly challenged and I feel that I could have been pushed further and learned a bit more in some aspects." (Case 3)

Finally, the following comment was made by a survey participant:

"After trying Science, Arts and Commerce, only IS taught me the necessary skill sets to excel at Uni and in life".

Discussion and Conclusion

Despite some issues identified from previous studies regarding the relevance of IS/IT curricula, by exploring the opinions of students at their final year of the BIS program through a combination of interviews and a survey, this study suggests that the BIS course at the University under study has provided valuable learning experience for many students in general as it helps students develop the critical IS professional skills. In particular, students agree that their interpersonal skills and communication skills, which are considered to be the most important skills by many employers, have been well developed through the course. This is achieved mainly through the many group work involved at the BIS and the strong support from the Department through the provision of the Professional Skills Program (PSP). Although group work has given positive impacts on many aspects of students' skills development, there were some issues raised by the participants as some students feel that there are too many group works involved and some work was not quite appropriate for being a group work. In addition, their performance would depend very much of the overall performance of the group and, therefore, the mark, does not necessarily reflect their skills. This issue requires further attention in the effort to improve the BIS program.

In addition, the study also indicates that there is room for improvement in developing technical skills of students. The BIS program should ensure adequate assistance is provided in all technical subjects and students are given enough opportunity to develop those technical skills. The group work issue may be related to the opportunity since some students may not learn some skills during the course because the work is completed in group. Technical skills are normally difficult to assess through the final examination and, therefore, some students

feel that even their overall marks are good for those technical subjects, they are not confident in the related skills.

During the interviews, a need to help students establish a career path while completing the BIS degree was recognized. This may involve offering more elective subjects and providing more guidance to students in selecting elective subjects in order to pursue a specific career path. This would also help students to better understand and value the subjects they take.

Furthermore, while BIS has put much effort into developing students' communication skills, it is believed that BIS should further increase students' awareness of the importance of communication skills for their future career. This way, students are expected to better use the opportunities given in developing their communication skills through various activities, including presentation, group meetings and so on. While some students appreciate the value of the PSP, some also find the program to be unnecessary as it overlaps with other IS subjects. However, all students interviewed believe that the PSP Workplace Transition was extremely useful. This calls for a further investigation and review of the PSP program to make it valuable to more students.

Finally, some subjects, particularly Managing IT Functions and Strategic IS Management, put the BIS into perspective and, thus, help students understand what to expect from the course. It could be useful for such subjects to be offered in the earlier year to stimulate students' interest throughout the course by knowing in advance why they are doing BIS. This will in turn help them appreciate and understand the skills they need to develop during the course.

While this study has shed some valuable insights into how well the BIS course is in facilitating the development of critical skills of IS professionals, the results need to be interpreted carefully as there are at least two limitations involved in this study. Firstly, the participants of this study are not necessarily graduating at the end of this year and, therefore, some of them may have not completed some core subjects including the Industrial Project. This may affect their perception regarding their preparedness and their confidence in the various IS skills developed during the course. Secondly, during the interview, students' responses could be biased because the interviewer was their lecturer and they might feel embarrassed to express honest opinion in some cases. Nevertheless, through the triangulation, the quantitative data have confirmed most of the qualitative data and, hence, the validity of the findings can be enhanced.

Further analyses can be performed on the data collected in this study to investigate if there is a relationship between students' satisfaction with their skills development and some factors including marks, gender and working experience. This will complement the understanding obtained from this study. Moreover, a further study into some issues related to group work and assessment as well as elective subject offering as identified in this study to identify appropriate course of actions would be valuable as the University is working towards the new model. Finally, a further analysis into the wider issues related to the relevance and usefulness of IS/IT curricula for the current market situation could also be performed by replicating this study in some other Universities offering IS/IT courses to find out if students' perceptions of the course are indeed different from those of practitioners as suggested in previous studies.

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