A New Approach to a First Year Undergraduate Information Systems Course

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Abstract

This paper describes the development, implementation and evaluation of a new teaching approach for a large first year undergraduate course in information systems at the University of New South Wales. Poor quality of experience for students attending large lecture courses was recognised, and an alternative approach developed that aimed to improve the first year experience by minimising large formal lectures and encouraging both student independent learning and quality small group interactions. A course structure based on small regular workshop groups, weekly web-supported independent activities (WSIA) completed by students before attending class and occasional lectures was initially implemented in first session 2002. A variety of course evaluation approaches were used to assess the success of the course design and implementation, including student focus groups, student feedback questionnaires, standard university course and teaching evaluations, weekly meetings of staff, observations and informal conversations with students. This paper describes the recognition of the need to improve the course, the design and development of the course, discusses the first implementation of the course, it reports on the evaluation of the course and describes some consequent changes implemented in the subsequent offering of the course.

Keywords: Teaching innovation, large student groups, independent learning, small group work, course design, course evaluation, web-based learning.

1. Introduction

The skills that young people need to be successful in today's IT work environment include high level oral and written communication skills and the ability to work collaboratively in a team.

For example Hudson (1992) identifies the need for:

- Communication and interpersonal skills
- Understanding of the business world
- Realistic expectations and understanding of the nature of IT work
- Experience in team work
- Grasp of social, legal, ethical and management issues.

Similarly the Joint Task Force on Computing Curricula (2001) recommends (recommendation 10)

> "CC2001 must include professional practice as an integral component of the undergraduate curriculum. These practices encompass a wide range of activities including management, ethics and values, written and oral communication, working as part of a team, and remaining current in a rapidly changing discipline. We further endorse the position articulated in the CC1991 report that "mastery of the discipline includes not only an understanding of basic subject matter, but also an understanding of the applicability of the concepts to real-world problems."

Many university courses, particularly large first year courses, are organised in a way that groups students into large lecture groups of hundreds of students where they are involved in the passive role of listening to the wisdom delivered by a lecturer at the front of a tiered lecture theatre. This was the case with the large first-year information systems course at the University of New South Wales. Many staff who had taught the course over a number of years recognised that there were problems with the way the current course was primarily delivered to large lecture groups, and that there was a need to improve the experience of both the students and the staff involved.

Further motivation for a review and revision of the course came from the introduction of new senior secondary courses in computing. Some of the existing problems of the course would be compounded by this new group of students who would have completed up to 220 hours of introductory information systems content at the high school level. Such students were potentially the school's best candidates for honours and research students, but were also unlikely to be inspired by the first year course in its lectures/tutorial format. Evidence for this is discussed below.

2. Students Studying the Course

The course at the focus of this paper, and the reported course revision, is an introductory first-year undergraduate course in information systems. It typically attracts 400-500 students in each session per year, a total of up to 1000 students annually. The course is offered

within a BCom (Bachelor of Commerce) degree, in the Faculty of Commerce and Economics.

The intake for this course is extremely diverse. The course is compulsory for first-year information systems majors and accounting students studying a BCom, and is also compulsory for scholarship programs that fall within the field of information systems. Within the BCom, students can major in finance, international business, industrial relations, actuarial studies, business law and taxation in addition to accounting and information systems. Quite a few students choose to take the course as an elective in other degree programs, including Computer Science, Engineering and Arts degrees. Although this is a first-year information systems course, many students, particularly the accounting and computer science students, study the course in their second or third year.

As evidenced by a survey conducted in week one of session 2 in 2001, the backgrounds of students in this course is also quite diverse. They vary in age from 17 to 38 (mode of 18), come from 33 different cultural backgrounds and more than half speak a language other than English at home. Approximately two thirds of the students are local, and one third international.

3. Problems with Course Structure pre 2002

Up until the end of 2001 the course had a formal component of three hours per week over 14 weeks. It was structured as two one-hour lectures per week, with an additional one hour per week of tutorial or laboratory work.

Staff teaching the course were aware of a number of problems with the course, including low attendance at lectures after about week 6 or 7. The delivery model of presenting information to large groups of students, requiring passive reception of information was seen as problematic. It encouraged a reliance by students on lecturers as source of authority and as a result students seemed to lack independence and did not appear to accept responsibility for their own learning. Students tended to rely heavily on staff to provide guidance for assignment work, and made few attempts to integrate information from multiple sources in their work. Students usually used information from a small number of (often internet) sources in their assignments. There was a relatively low level of critical thinking evidenced in students' work, and on the whole there seemed to be a poor learning experience for students and a poor teaching experience for staff involved in the course.

The course in 2001 exhibited many 'Theory X' characteristics (McGregor, 1960; Biggs, 1999). Students were tightly regulated, with restrictive assignment requirements and an extensive and detailed course outline of some 125 pages covering everything from sanctions for non-attendance or unruly behaviour in lectures, penalties for late submission, to which corner of the assignment had to be stapled. Students were given detailed lecture slides, sometimes running to over 100 slides for a 1 hour lecture.

Such an approach was unlikely to create opportunities for independent learning.

> "Cognitively, theory X restricts the range of potentially useful ways of learning, particularly self-directed learning…Affectively, theory X generates negative feelings, which distract from proper task engagement, directly encouraging a surface approach." (Biggs, p63)

Indeed, students in this course displayed relatively naïve epistemological beliefs[·] (Schommer, 1994a and 1994b).

'Epistemological beliefs' is an area that is increasingly seen as influencing learning and cognition, and an area of investigation afforded greater attention by the educational research community in recent times. Beliefs about knowledge have been shown to influence factors such as student's motivation, persistence or problem solving approach (Kardash and Scholes,1996; Schommer, 1994b; Jacobson and Spiro, 1995). Kardash and Scholes (1996) draw attention to 'A growing body of evidence (that) suggests individuals' epistemological beliefs play a critical role in strategic learning in general and higher-order thinking and problem solving in particular' (p261). Schommer (1994b) suggests that '... epistemological beliefs affect the degree to which individuals (a) actively engage in learning, (b) persist in difficult tasks, (c) comprehend written material, and (d) cope with ill-structured domains. In each of these areas, the evidence suggests that epistemological beliefs may either help or hinder learning' (p302). In summing up, the same article Schommer concludes that '... there is enough evidence to suggest epistemological beliefs are critical to the learning process' (p315).

Tolhurst and Debus (2000, 2002) found that the navigational strategies and learning approaches adopted by students' using complex software may be influenced by their epistemological beliefs. Dimensions of Schommer's epistemological beliefs were found to be relevant were those of certainty of knowledge, structure of knowledge, source of knowledge and speed of knowledge acquisition. It was found that if students possess naive beliefs of knowledge, such as belief that knowledge is absolute, is simple, is handed down by authority and is acquired quickly or not-at-all, then this is likely to affect the way that they use software to seek information. With less sophisticated beliefs students were likely believe that there is one answer to be found, and it will be found quickly if the software is authoritative or it will not be found at all. With such beliefs, students were not likely to persist in information seeking beyond the situation in which they locate any information they believe satisfactorily answers a question, on in the event that they do not find an answer relatively quickly. Conversely, with more sophisticated beliefs students, were be more likely to seek additional information to that first identified and persist in the event

[·] A study of epistemological beliefs involving students from the 2001 and 2002 intakes is currently underway, and is the subject of a separate paper to be published by the first author.

of being unsuccessful at first. The information seeking behaviour described in the research of Tolhurst and Debus was consistent with the behaviours exhibited by students undertaking their research and assignment work before the changes in the course described in this paper.

Epistemological beliefs research that is of particular significance to the work discussed in this paper is the research by Brownlee, Purdie and Boulton-Lewis (2001). Brownlee et.al conducted a study with Australian tertiary students at the University of Queensland that show it is possible to significantly influence students' epistemological beliefs and produce positive learning outcomes. Brownlee et.al. measured students beliefs before and after a course of study in which two groups of students experienced a year-long of study in which one group was required to reflect on their epistemological beliefs using personal diaries. They found that the group involved in reflective practice experienced a statistically significant shift to more complex epistemological beliefs that those students who did not. They conclude that student epistemological beliefs are able to be influenced, and that this has implications for how educators develop learning environments.

Another study (not related to epistemological beliefs) that supports the argument that learning environments can influence students study and progress is that of van der Hulst and Jansen (2002). Using a multilevel analysis, these researchers from the Nederlands found evidence that the spread of study activities over the year, instruction characteristics and examination characteristics were found to have effects on progress. They suggest that that institutes in higher education may improve their students' progress to some extent by means of efficient curriculum organisation.

Based on the work of Brownlee et. al. that epistemological beliefs can be influenced, and that of van der Hulst and Jansen suggesting curriculum organisation influences student progress, a course revision was undertaken in an attempt to established learning environments might encourage in students more complex epistemological beliefs, and hence encourage more appropriate study approaches and independent learning in our students.

4. Desired Learning Outcomes for a New Course Structure

A working party of ten volunteers reviewed the course in early 2001. As part of this process, desired outcomes were identified by the working party that concluded it would be beneficial to:

- increase student participation levels and improve attendance patterns
- foster students development of critical thinking skills
- encourage students to seek information from multiple sources and integrate the ideas they find
- develop in students a passion for the domain of study
- focus on up-to-date materials in the domain
- establish beneficial study patterns and habits while students are beginning tertiary study
- better cater for range of abilities, backgrounds and experience
- improve the experience of students, recognising the potentially alienating effect of large lecture groups on students accustomed to high school class-sizes
- capitalise on the enthusiasm of first year students, and encourage their interest in the study of information systems - potentially leading to a greater number of research students in later years
- develop in students the skills they need for information seeking that they will need for life-long learning
- support students in the development of proper referencing skills to overcome problems with plagiarism. Some students do not understand the issues associated with intellectual property, plagiarism and the need to acknowledge sources. This is particularly relevant in a course like this that utilises the internet and other electronic sources.
- improve the experience of teaching this large subject.
- recognise the demands on the Lecturer-in-Charge and Tutor-in-Charge of managing a student group of more than 400 students.

5. Structure of the New Course

In an attempt to achieve the desired outcomes, and to overcome the problems identified with the existing course structure of two hours of weekly lectures and one hour tutorial, an alternative course structure was designed that aimed to minimise large lecture groups, encourage students independent learning and also maximise the opportunity for student small group interactions.

A course structure that had at its focus web-supported independent activities (WSIA) and regular small group workshops was designed. The lecture component was minimised to just five one-hour lectures during the whole session of fourteen weeks. These main components are described in the ensuing sub-sections. This structured was adopted in the belief that independent activities and small group activities would engage students with the course material to a greater degree than attendance at lectures was achieving. Small group workshops offered many opportunities to establish collegiate groups of students that are likely to develop closer relationships with workshop facilitators. The WSIA were organised to precede the corresponding workshop (or lecture). Both components, the independent activities and the workshops, were seen as enabling students to accept a greater degree of responsibility for their own learning than was currently the case in a large lecture situation.

5.1 Web Supported Independent Activities (WSIA)

Weekly activities required students to undertake regular independent work, as specified on a clearly labelled page

on the course website. The WSIA were written with the expectation that students would spend 1.5-2 hours per week on the activities, and were considered as part of the formal course work. The structure in 2001 involved 1.5 hours of lectures and 1 hour tutorial. This was primarily replaced by 1.5 hours of workshops and 1.5 hours of WSIA.

The WSIA were intended to prepare students in the basics of a topic of study that were to be later explored in either the workshops or lectures. Ideas and impressions gained by students from the exploration of commercial websites (current uses and implementations of technology) were linked to the theoretical information that students read in journal articles and textbook chapters.

The activities were posted on the course website at least a week in advance, and it was assumed that students had completed this work before attending one of the regular workshops or occasional lectures. The independent activities required students to undertake tasks such as:

- making notes, answering questions, drawing diagrams, etc. based on readings
- preparing notes and hand-ins for workshop sessions
- reading journal articles,
- reading case studies, preparing responses to questions on the cases
- undertaking self-paced skill-development in software use
- completing on-line tutorials
- exploration of commercial, and informational websites
- Maintaining a portfolio of independent activities

In addition to the content focused activities, the independent activities guided students in finding information from a number of sources, with supporting instructions diminishing over the time frame of the course. Over the duration of the course, students were directed to seek information from a number of sources, utilising:

- the course website and the textbook publisher's website
- the library catalogue, on-line databases and electronic journals
- library closed-reserve and general collection
- commercial and informational websites

Textbook chapter readings did not form part of the structured independent activities, but it was expected students would undertake regular textbook readings as part of the work students would do to prepare each week for any course.

To additionally support learners in their independent activities, students were explicitly referred to the Learning Centre, and faculty EDU (Educational Development Unit) websites. The EDU also developed and ran workshops on specific study skills, designed specifically for students of this course.

5.3 Laboratory Access

To support the students undertaking their independent work a computer laboratory was booked for the exclusive use of these students for 28 hours a week. This amount of time represented at least 1.5 hours of laboratory access for each student, each week. Students were not allocated a laboratory class time, but were told to utilise the laboratories at a time that suited them. Students were required to manage their own time, using the laboratories at a time that suited them and avoiding 'busy' times. Students could also choose to complete independent activities in any other location where they had access to a computer with internet access.

Laboratory demonstrators were employed to assist students in the booked laboratory every week for at least nine hours a week, and at anticipated busy periods their availability was increased by up to six hours a week. Students could seek assistance from the laboratory demonstrators if they were having difficulty locating information, using software, or if they had problems with practical activities using software applications.

The practical work involved students working with HTML and either a spreadsheet or JavaScript. Accounting students are required to undertake the spreadsheet activities and assignment as part of CPA accreditation, and JavaScript is an option for other students, like the Computer Science students, studying this course. Laboratory exercises were checked and signed-off by peers.

5.4 Workshops

Students attended workshops on eight occasions during the session, in classes with a maximum of twenty-four students. Workshops were held in a room with flexible furniture, and the arrangement of the seating and tables was varied from week to week depending on the activities to be undertaken that week. The room was used almost exclusively by this course and all workshops were held in this room. This enabled the room to be set up at the beginning of the week in an appropriate configuration.

Each workshop was facilitated by an experienced member of staff who was able to encourage open discussion and answer questions that may arise from the work students had undertaken in the WSIA and text book readings. An important aspect of the workshops is that lecturers ran the class based on the assumption that students had completed all of the WSIA and the workshop activities were designed to build on this work.

The kinds of workshop activities undertaken were aligned to a problem-base learning (PBL) approach, and the goals of PBL as described by Biggs (1999, pp208,9). Specifically:

- Structuring knowledge for use
- Developing reasoning processes
- Developing self-directed learning

- Increasing motivation for learning
- Developing group skills

Workshops involved students in activities like:

- small and whole group discussions of activities from WSIA. These discussions explored issues evolving from the independent work, and were often integrative in nature, focusing on broad IS concepts.
- case studies, ranging from cases analysed as a WSIA to cases presented and analysed during the workshop.
- Debates, prepared by groups of students and carried out during workshops.
- tutorial activity - data modelling, create a diagram, concept mapping.
- quick quizzes marked by peers during the workshop.
- student presentations either individual or group.
- short lecture style 'wrap-ups'
- videos and demonstrations of software or web-sites.

5.5 Lectures

Five, one hour lectures (with repeats) were held during the session. There was a lecture in each of the first three weeks, with a focus of explaining the course structure and of introducing some preliminary content for the course. There was a lecture in the middle of session that was used to discuss the integration of the topics addressed in the course up until that point, overview content covered to that point and introduce some of the work that was to be address in the weeks ahead. There was a final lecture in the last week of session that allowed course evaluations to be completed, a summary of the course content to be discussed and some information provided about the final examination.

Lecture weeks also required students to complete WSIA, and lectures called upon preparation that students had done.

5.6 Summary of the Course Structure

The weekly experience of students was the undertaking of independent work, managing their own time and attending either a workshop or lecture.

The course structure was designed to benefit students by:

- encouraging independent learning and small group interaction, rather than student involvement in passive reception of course content in large lectures
- exposing students to current web-sites, readings, cases and other materials that are current, focusing the course on real-world information that is up-to-date
- reducing class sizes so as to allow students and staff to develop closer relationships than would occur in a large-lecture situation. Workshop leaders provided a familiar contact-person for students.
- including activities in workshops and WSIA that enhance students' development of skills in language and communication, research and referencing, information literacy, groupwork, in addition to the development of discipline knowledge
- including learning activities that are structured to cater to the diversity of student backgrounds

6. Course Evaluation

The evaluation of the course was undertaken using a number of approaches. These included: student focus groups held on three occasions during the session; student feedback questionnaires completed by all students in the course; the university standard course and teaching evaluation questionnaires completed at the end of session; weekly meetings of lecturing staff; observations and informal chats with students.

The major evaluation components were undertaken at three times during the session. An early set of focus groups and student feedback questionnaires in weeks five and six (after three lectures and two workshops); a second set of focus groups in week ten; a final set of focus groups, student feedback questionnaires and formal university teaching evaluation in week 13 and formal university course evaluations in week 14.

Discussion of each of the evaluation 'checkpoints' follows.

6.1 Weeks 5/6

After three weeks of lectures, and two workshops a first evaluation 'checkpoint' was made. At this stage focus groups were held in week five, and student feedback questionnaires completed in week six. The timing of these was dictated to some extent by the Easter break in 2002 at the end of week five.

6.1.1 Student Focus Groups

Four groups of five student volunteers were participants in the focus groups that were facilitated by two people not involved in teaching the course. This was seen as necessary as students' discussion of the course may have been restricted if they thought that a person with some control over course marks and results worked with the groups. Students were encouraged to participate with the offer of a book voucher if they attended all three focus groups during the session.

Because the students volunteered and nominated the times that they would attend, student groups that represented particular populations in the whole student cohort formed naturally. The student populations in the cohort that were represented were: first year students studying one of their very first courses at university; scholarship students who were high achievers at school and obviously gained entry to an elite university program; second and third year students who were doing a accounting major and for which the information systems course was core in their program of study; and, a mixed group of students that did not represent any one particular population. In the first set of focus groups particular

trends in responses from these groups were not apparent, but in later sessions definite differences emerged.

The major trend coming from most of the students in the focus groups in week 5 was that they were quite surprised and unsettled by the new course structure. Students had talked to friends who had done this course previously, and '…it was not like this last year'. Students commented that they did not see how the course components fitted together, and did not understand the 'big picture' of the overall purpose and direction of the course.

Students commented that the amount of work that they were required to complete each week in independent activities meant that they were spending more time on this course each week than they did on other courses they were currently studying. When quizzed about the actual numbers of hours spend some said 2-3 hours per week, others reported that it was taking up to 5 hours a week. They explicitly stated that the amount of reading was problematic. A comment was made that '.. a lot of preparation was needed to get the most out of workshops'.

Interactive small group activities in the workshops were seen by students as being an enjoyable experience, but some students felt that the workshops were too short, disorganised and disjointed. They felt that workshop facilitators were '…rushing through the material and not covering complicated concepts in detail'. Some were clearly in favour of having someone who understands the material teaching them, introducing new concepts and carefully explaining complex ideas. A group also expressed their concern about what material was to be covered in the exam, and what level of understanding would be required of them.

In contrast to the response described from the above students in the focus groups, a minority suggested that the WSIA were not overtaxing, taking less that an hour to complete each week. This minority also saw the WSIA as being beneficial and appreciated the opportunity to '.. learn at their own pace..' and to '… develop their own study approaches'. They enjoyed the opportunity to work at their own pace, and had not experienced difficulties completing the independent work. This group also stated that they liked the interactivity of the workshops over passive learning in lectures, and had no problems with the number and pace of activities.

6.1.2 Student Feedback Questionnaires

The student feedback forms were completed by students attending classes in week 6. The feedback questionnaires asked students to write down 'three things that they liked about the course' and 'three things that they would change'. Five minutes or so of class time in the weeks 6 and 13 workshop was devoted to the task. Not all students gave three responses to each group of possible responses (likes, changes).

This student feedback confirmed the trends of feedback from the focus groups. Comments about the amount of work and reading required in the WSIA, the lack of links between the WSIA and workshop activities and the desire to have regular lectures as well as workshops.

As shown in Table 1, the things that the students would like to have seen changed were: reduced workload and less reading, more face-to-face teaching, different course structure (possibly the more familiar lecture/tute mode), more feedback on their work and a mid-session exam.

Comments	**Number of Responses**
Reduce workload	84
Reduce amount of reading	84
More lectures, teaching or workshops	73
Include lessons on using software (Excel, JavaScript, HTML)	42
Would prefer different course structure	22
Provide more information about the exam	15
Course structure unclear	13
Need more feedback	7
Would prefer mid-session exam to be included	6

Table 1: Student free responses to 'three things about the course could be changed' (n=271)

Students who may not have completed the work before the workshop realised that in order to keep up and understand the work undertaken in the workshops they must do the preparation required in the WSIA. In a feedback response one student suggested as a potential change to the course:

> "…I think there should be lectures every week because students who don't read the textbook or do independent study don't learn anything".

On a more positive note, many students expressed the opinion that they liked the relevance and currency of the material covered in class, and the experience of the workshop sessions. They enjoyed the small group interactions and they liked the atmosphere in the workshop sessions. Individual students identified particular activities from the workshops that they had enjoyed. Comments about the workshop included:

> "[I liked] the workshop as opposed to lectures as they involve more interaction and allows more discussion."

and

> "Workshops are more involving than lectures and more interaction means more knowledge. They encourage groupwork [and] gives (sic) students a chance to meet and get to know each other."

An interesting trend that emerged, especially in light of the comments of regarding the large amount of work and reading, is that a number of students also said that one of the things they liked about the course was the requirement of attending only 1.5 hours of class a week.

As shown in Table 2 below, the trend in the things that students liked were: the real world cases and materials used in the WSIA and classes, the interaction and atmosphere in the workshops, the practical computer-based work, the level of independence offered, the debates in which students were involved, their lecturers, the low amount of class time, and the course website.

Comments	Number of Responses
Interesting content, meaningful, up-to-date, relevant	82
Workshops, atmosphere, interaction	66
Practical work (Excel, JavaScript, HTML)	56
Minimal contact hours, less lectures	47
Independence, flexibility	41
Good teachers, approachable, helpful, friendly	35
Debate	32
Course structure, well organised	25
Web site	16

Table 2: Student free responses to 'three things you like about the course' (n=271)

6.1.3 Response to Student Feedback

A desire to indicate to students a confidence in the new course structure and desire to remain true to the approach meant that no major changes were made, but a response was made to some of issues that students raised and acknowledged by staff as problematic. The overall amount of required reading was reduced, but students were still asked to read weekly text chapters and additional journal articles on occasions. The number of workshop activities was reduced to two (from three or four) per workshop session, allowing more time for students to discuss ideas and consolidate their learning. At the beginning of every workshop session lecturers explicitly made links for students between the independent activities and the workshop tasks. Lecturers also made the links between the different topics in the course explicit.

6.2 Week 10

Focus groups were repeated in week ten of the session, with students mostly attending with the same students the met with previously. There was quite a difference in responses by week ten, and there were discernible differences in the responses from the groups.

Overall the response from students was more positive in week ten. All of the students were much more aware of how the course components related, and also were more aware of how the topics covered in different weeks were related. Students also recognised the changes that were implemented regarding the number of activities in the workshops, and the reduction in work load with respect to required readings. They were positive about these changes.

The differences that emerged with respect to the different groups were very interesting. The group that was primarily composed of first year, first course students were still troubled by the amount of readings, although they acknowledged that the load was reduced. They said that they felt overwhelmed by the amount of work required in the independent activities, stating that they did more work in this course than any others they were currently studying. These students said that the workshops were still a bit too rushed and that they would like more 'lectures' or formal teaching.

In contrast to the first year, first course students, the group of students who were mainly second and third year students spoke of the new course structure in glowing terms. They commented that they liked the flexibility of the course and the independent structure of the WSIA, and that they were becoming more organised generally in their approach to study overall as a result of their experiences in this course. They felt confident in accessing the different sources required during the course. They described the workshops as relaxed, casual environments that provided a 'fresh' approach to learning that was different to their experiences in tutorials in other courses. In the words of one student:

> "I think they [the workshops] are good cause they are different from other tutorials. In most tutorials you go in and half of the class isn't doing the tutorial work anyway. You just go in there and get the answer from the tutor, so you don't really learn. In the workshops, it is very good because you do learn. Because of the WSIAs and you've got to discuss, you do learn. You have to absorb direct and find things out, so yeah, its very fresh. I mean it's very fresh to have the workshops. You actually look forward to going. Especially now everything is available on-line, all the answers [to tutorials] are available on-line. If you don't want to go to a tutorial and copy down the answers you might as well have it done on-line and you don't even have to turn up. But, through the workshops, it makes you want to turn up."

These students expressed the opinion that they felt that they were learning more this way than they were in their other courses.

A third group of students, the high achieving scholarship students, responded differently to the two other groups described above. These students seemed a little 'phased' by the course approach. They claimed that they knew how to be successful in their studies, after all they got high marks in the Higher School Certificate and were now in the scholarship program. They felt uncomfortable however, about what they were really expected to do in this course, and whether they were doing what was required. One student said:

> "…in other courses, what I have found is that there is more, much more structured patterns. … for example, maths, the way that you know how much more you need to know is when they say here is a

series of problems, and if you can do them you know enough".

These students were also concerned about what the final examination was going to be like. If the course is different, how different could they expect the final exam to be?

6.3 Weeks 13

The responses from the students in the week 13 focus groups were consistent with the findings in week 10. The three groups of student made similar comments to those in week ten. The second and third year student maintained their overall enthusiasm for the course approach, encouraging the continuation of the approach in coming sessions. The first year first course students maintained their cry that there was too much work and reading and the scholarship students continued to be concerned about the final examination in particular.

Student feedback questionnaires, three things you like and three things you would change, were repeated in the week 13 workshop, again, with similar outcomes to the previous ones.

6.4 Lecturers' Evaluation - Weekly Meetings

The lecturers teaching the course met weekly to discuss the successes/failures of the previous week, and to be briefed on the week ahead. Over the teaching session there were ideas and impressions expressed by the lecturers that were in fact evaluative feedback about the course and quality of the teaching experiences.

It was apparent that teaching the workshop sessions were different to teaching tutorials as experienced in most other courses. Rather than working through set exercises that students had previously attempted, staff were involved in facilitating group activities based on students WSIA preparation, and the nature of the activities were variable within and between sessions. Lecturers needed to be prepared for any questions from students on a topic, based on WSIA activities and readings students had done in preparation for the workshop. Lecturers commented that in order to lead the workshop sessions they needed to be knowledgeable in the domain, and have good teaching/facilitating skills and experience. Lecturers also commented that managing the 1.5 hour workshops and ensuring that activities are covered meaningfully in the time frame was challenging.

Encouragingly, lecturers generally expressed the opinion that while the workshops were challenging, that they were also rewarding and that they enjoyed the experience overall. Students raised ideas and points of view in the classes that were interesting and thought provoking, and that getting to know individual students in class added another interesting dimension to the teaching. A number of lecturers also commented that they were taking ideas and experiences from teaching in this course and implementing them where appropriate in other courses they were teaching.

Comments from the lecturer-in-charge of the course indicated that the course preparation and management was challenging, but the rewards made it worthwhile. In addition to the materials prepared and distributed for all students on the course website, materials and readings required of students in the WSIAs were prepared and distributed to all lecturers to facilitate preparation. Workshop plans and teaching resources (like overhead transparencies, handouts and items used for in-class demonstration) were also prepared for all the lecturers. The rewards of this preparation were that lecturers maintained consistency across classes and that students made fewer individual enquires of the lecturer-in-charge. It was necessary to be prepared well ahead, preferably two weeks so that lecturers could prepare themselves properly for class, and also to support students in their own time management.

6.5 Course Evaluation Summary

In the initial stages of the course evaluation students were distressed by the unfamiliar course structure and felt unsure as to what was expected of them. As the course progressed, students developed a better understanding of the overall course structure, and began to feel more comfortable. Second and third year students responded the most positively to the independence and opportunities offered by the course, but all students responded well to the small group workshops and the active involvement in learning. First year students, and scholarship students, would have preferred a higher level of content structure, and sought the support of formal lectures in addition to the course components offered.

Overall the lecturers found teaching in the course rewarding, challenging and different to 'normal' tutorial teaching.

7. Conclusions

The design and implementation of this course has been a matter of meeting many challenges for both staff and students. These challenges have involved balancing many factors.

One challenge has been balancing the need to provide sufficient structure to students to guide their learning in Information Systems vs overtly telling students 'this is what you need to know'. We recognise the need to provide broad orienting frameworks for the area but not in the form of traditional lectures.

A second challenge is to have students recognise the nature of the workshops, which form an essential component to this course. The workshops are not like traditional lectures nor are they like tutorials in the form students may encounter them in other subjects. The workshop activities engage students in meaningful and enjoyable learning and need to be of sufficient length to achieve this. Over the course of the Semester we have reduced the number of such activities thus allowing more time for students to analyse and discuss. Lecturers have needed to steer a course between turning these workshops into mini -lectures and treating them as tutorials in which the 'correct answers' are given to set exercises. Student feedback has suggested that students do find the workshops of value.

A related challenge has been in designing the WSIAs. These activities are designed to encourage students to explore multiple sources of information and to engage in independent learning. Many (but not all) of the activities serve as essential preparation for the workshop in the following week. The challenge is to have students see these activities as useful in their learning and not merely as a set of tasks that must be completed. The workshops draw on the preparation that students have done in the WSIAs and their textbook readings. The majority of students do spend a significant amount of time on the WSIAs and need to see the immediate benefits of doing so. It is a challenge to ensure that students are able to draw on this independent work in the workshops, without which students may form the view that they are going to be given the 'answers' in a workshop or, worse still, their work will be ignored.

Although students were required to maintain a portfolio of work, this was not structured as a learning portfolio. The emphasis was on a record of work-completed as a study-guide, rather than a reflective aid. On reflection, a move to a genuine learning portfolio would have been of benefit in supporting students' independent learning Biggs (1999).

For lecturing staff, involvement in the course has been both challenging and enlightening. It has highlighted the importance of a sound and broad understanding of the IS area and the particular demands of teaching in small groups. There has been considerable interest generated by the approach we have taken to this course, from within the school, the faculty, other faculties within the University of NSW and also other universities. Several of the lecturers involved in the course have taken the ideas and applied them to other courses, and other schools are exploring the possibilities of using the approach we have used in their courses. We will continue to refine and develop this approach and hope to learn from our own experiences and the experience of others, further ways to improve the first year experience of our IS students.

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