

Developing the Interpersonal and Communication Skills Necessary for Effective Requirements Engineering

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Abstract

Information Systems professionals involved in requirements engineering need to be able to interact effectively with users as well as with other members of their development team. There has been much written about the need for Information Systems graduates to have good interpersonal and communication skills when they go into industry. Many of the current curricula recognise this need and have identified some of the skills that need to be addressed. Less has been written about how to develop these skills within Information Systems curricula. This paper first looks briefly at the skills that have been identified and how these would be used in requirements engineering. It then discusses a unit implemented to help develop these skills and presents some of the students' experiences of the unit. The paper concludes by reflecting on the lessons learnt and making suggestions for improvement.

Keywords

Requirements Engineering Education, Soft Skills, Information Systems Education

Introduction

The main activities involved in requirements engineering (RE) are eliciting information, gaining insight and understanding into the application of the system, negotiating in conflict situations, describing what has been understood and validating and managing system requirements (Carr, 2000). All of these activities involve the need for an Information Systems (IS) professional to be able to interact and communicate with others.

This paper briefly summarises some of the literature on the need for these interpersonal and communications skills (also called soft skills) and how various IS curricula have suggested that the problem be addressed. It then goes on to describe a unit taught at the Port Elizabeth Technikon in South Africa, which tries to integrate the needs of industry with the needs of the students in this regard. While this study was done in South Africa and the results of the research must be seen in this context, many of the ideas could be incorporated in other parts of the world.

Soft Skills development in IS and CS graduates

There have been many studies that have looked at the need for Information Systems (IS) and Computer Science (CS) graduates to develop their interpersonal and communication skills in order to meet the needs of industry. van Slyke, Kittner and Cheney (1998), Doke and Williams (1999) and Bailey and Stefaniak (2000) are some of the authors who have written about this need in recent years. These studies have shown that skills such as general thinking, oral and written communication, interpersonal skills and group dynamics are important to an IS graduate. It has also been shown that poor communication between users and developers is a major factor in the failure of many information systems. In a study of RE education, Macaulay and Mylopoulos (1995, p1) found that RE courses tended to focus on techniques and models, but that industry required that students be taught interviewing skills, groupwork skills, negotiation skills, analytical skills, problem solving skills and presentation skills together with the modelling skills.

Curriculum developers for IS and related fields have also recognised this need. The IS'97 curriculum (Davis, Gorgone, Couger, Feinstein & Longnecker, 1997) suggests that both communication and interpersonal skills need to be fostered within an IS curriculum. They suggest that this be done by having a prerequisite communications course, which should provide students with listening skills and knowledge of how to be effective in written and oral communication. They then propose an additional learning unit to cover such issues as teams, group dynamics and consensus development. The latest core curriculum for Computer Science (ACM, 2001) suggests that courses must help students to strengthen their communication, problem-solving and technical skills. They propose that this can be done through special general education communications units, through integrating the skills into the curriculum and through having professional practice units where students work in industry. The integrated approach has been chosen by the developers of the Curriculum Model 2000 for the Information Resource Management Association and the Data Administration Managers Association (Cohen, 2000), while having specialist courses has been suggested by Informatics Curriculum Framework 2000 (ICF-2000) for higher education (Mulder & van Weert, 2000).

The problem with having specialist units taught by non-IS lecturers is that students do not see the relevance of these issues for their careers. On the other hand if one only tries to integrate team activities, written assignments and problem-solving activities into the IS subjects, problems arise as students often do not have the necessary prerequisite skills and IS lecturers are poorly equipped to teach them these skills. Lecturers also do not have the time in, for example, a Data Communications course, to teach students how to write or communicate effectively in a group.

The Port Elizabeth Technikon decided to try to solve this problem by offering a unit in Communications and Interpersonal skills which was specifically targeting at helping students develop the skills they needed in the Information Technology (IT) industry. The unit developers looked at where the different skills were used in IS development and tried to develop exercises, workshops and material that was applicable and grounded in the industry. The following section describes the unit and gives some examples of how exercises were adapted to illustrate RE situations. The students were then also required to practise these skills in subsequent units of the course.

Towards a unit for soft skills development in IS students

In 2001, the Port Elizabeth Technikon ran this unit over one semester with approximately forty hours of contact time. The contact time is quite high as it is imperative for students to be given

opportunities to practise the skills and be assessed on them. For this reason, the unit was divided into two 1 ½ hour sessions per week. The first session was with a large group and was used for teaching the skills, showing videos and small group activities. The second session was run as a workshop, where the students were given opportunities to practise the skills under the guidance of the lecturer who acted as facilitator. RE situations were simulated in many of the workshops in order to give the students practise in these skills.

The unit was taught at second year level so that the students already had some idea of Information Systems and their use within a business. They had also been taught some of the modelling skills needed in RE. There were 118 students who took the unit. They were divided into two groups for the lecture and divided into four groups for the workshop activities. South Africa has its own special problems, both as a developing country and with a great diversity of students. These issues also had to be dealt with within the unit. This context should be kept in mind when deciding what is appropriate for use in other countries.

The various topics of the unit are discussed below together with a selection of activities that show how general communications and interpersonal skills exercises were modified to suit the IS course. Students were assessed using both formative and summative assessment. Assessment was done in the workshops, through presentations and reports, by peer evaluation and through a test given at the end of the unit. Some details of the assessment methods are given within the different sections.

Self esteem and assertiveness workshops

A student with low self esteem will not participate well in group activities. This is why this topic was covered first. Assertiveness is defined as behaviour, which helps us communicate clearly and confidently our needs, wants and feelings while respecting the rights of others. Students who are passive or those who are aggressive can learn from this type of workshop. The workshop helped them to identify whether they were passive or aggressive and to learn methods of being assertive, handling criticism and handling conflict. The idea of respecting other people and also respecting oneself is central to being assertive. These aspects were then emphasised and promoted throughout the rest of the unit.

Written communication

The traditional IT course had dealt fairly adequately with writing documentation. The writing of reports had not been emphasised, nor were the skills needed for investigating topics and doing research from literature. In the past, the students were expected to do written assignments with no training in how to write, use referencing properly or how to find information. In a developing country like South Africa, one cannot expect that they would have learnt these skills in secondary school.

Writing is more than just the technical, however. They were also taught how to brainstorm their ideas, organise their thoughts and write a document that flows and is cohesive. The techniques of writing good introductions and conclusions were also emphasised. Students then had to write an academic paper on a particular topic that was evaluated with regard to the introduction, conclusion, organisation, integration of material, flow and style as well as content.

Communication and Multicultural communication

The art of communication is important for an IS graduate. Listening and observing are probably two of the most important traits for requirements engineering. The “culture gap” between IT professionals and business is seen as a key factor in limiting the successful implementation of

information systems (Grindley, 1992). IS graduates need to be given ideas on how to become effective listeners as well as effective senders of information. Active listening was emphasised. Issues involved in dealing with diverse people were also discussed and related to the world of IT.

When applying exercises in different topics, it is important to adapt them to suit the needs of the students and industry. The paragraphs below show how a general exercise on communication from Pfeiffer and Jones (1981, p.69-74) was adapted to be more relevant for IT students.

The students were divided into small groups and each group was given the same set of K-nex® sticks and connectors to use. K-nex is a building toy from which very complicated 3-D models can be built. One of the groups was sent outside and asked to build a model.

The group outside was termed the “users”. The groups inside were the “developers”. The groups inside sent one person each out to the “users”. The users covered up their model and then had to explain to the “developers” how to build their model. Different communication techniques were used.

A discussion was then held on the different problems that were experienced. The “users” accused the “developers” of not listening properly and they said they had a problem because they had to repeat themselves over and over again. The problems of the “developers” were also discussed. Common problems included accusing the “users” of not being clear and trying to lead them astray. The different communication techniques were also discussed as well as the problems associated with each. These communication problems were then related back to the IT world.

Assessing communication skills is difficult. A formal test was held where the theoretical aspects were covered. Some aspects of communication were assessed in the JAD sessions and others in the Presentations, which are discussed later in this paper. Good communication is essential in being able to interview users, in meetings and group activities, some of which are described below.

Interviewing users

Interviewing users is an integral part of any RE. Inability to interview users properly can lead to requirements not reflecting the needs of the users or requirements that are inconsistent, incomplete, misunderstood, ambiguous or vague (Carr, 2000). Students need to learn how to prepare for an interview as well as how to ask pertinent questions to the user (Wood, 1997).

Many of the students have a very naïve idea of how to go about interviewing someone. They tend to ask vague questions like “What data do you need?” or inappropriate questions like “What time do you start work in the morning?”. They also have problems with documenting the interview and making sure that they write down all the relevant points. These problems are highlighted to the students in a role-playing exercise.

The students are put into groups and asked to set up questions for a semi-structured interview. The scene was set as a family-owned restaurant that sells food like burgers, hotdogs etc. The restaurant currently had no computer equipment except a till. The students were asked to get a list of questions ready for a semi-structured interview with the owner of the restaurant in order to determine the scope of the system.

The lecturer then acted as the owner of the restaurant. She pretended not to understand computer terminology, to be upset at having to repeat herself, gave short answers that required them to follow up, gave long winded answers that went off the topic and so forth. The students

had to choose one person from their group to conduct the interview and another to document it on the board. The various problems, amount they gleaned from the various questions, what makes a good question and which questions were inappropriate were discussed. This was an informal assessment method and the students were not allocated marks.

Students were assessed individually in the test, by asking them to set up semi-structured interviews as well as asking them how they would handle various situations that could occur in an interview situation with users.

Group dynamics

The importance of teamwork in Information Technology development cannot be over emphasised. Students must understand how to communicate in groups, group decision-making methods, finding consensus, giving and receiving constructive criticism, and methods of fostering group cohesion. They should also be able to work with people who are different from themselves. Managing conflict is another necessity for the requirements engineer. As inputs are received from many sources, some of these may be conflicting. The requirements engineer is then required to help resolve conflicts and negotiate with others (Macaulay & Myopoulous, 1995).

Workshop activities include problem solving and negotiating activities in groups. An example of this is given in the next subsection when discussing meetings. Group skills were assessed by means of case-study questions in a test and in the JAD sessions and problem-solving meetings, which are described below.

Problem-solving meetings

Different types of meetings are important in IT development. Probably the most important meetings will involve those where an IT professional works with users to design a system. Meetings for the IT development team are also common, however. It is important that IT students know how to behave in and lead informal problem-solving meetings. They should be able to take comprehensive minutes so that they can ensure that they remember what was done in the meeting. Some of this is also done in the JAD classes, which are discussed later.

An example of an exercise used is one where the students had to use various problem-solving techniques (like Consider all factors (CAF), Plus Minus Interesting (PMI)) to determine a method by which South Africa could use technology to help with the processing of votes at election time. This allowed them to consider aspects like rural communities, lack of electricity, fear of technology, cost versus benefits and come up with a viable solution as a group.

A negotiating exercise that was used was one where the students were told they were members of an IT team, who were required to implement a new computer system over the factory shutdown during the Christmas period. There were six of them who all wanted / needed to be on leave. One of them was the manager and he or she had to try to work out a plan with the team as to who should be allowed to go away and who should stay. A maximum of two people was allowed to be away.

These skills were not formally assessed during these exercises. They were formally assessed in the JAD sessions (which are a form of problem-solving meeting) and the test.

Joint Application Development (JAD) workshops

JAD is used often in requirements engineering. In the IT industry users from different departments and organisational levels are brought together into a workshop in order to determine the needs of a prospective system. The workshop is run by a facilitator, who must make sure that everyone participates and nobody dominates the session. A scribe keeps a record of what is decided (Davidson, 1999). In the lecture room situation, the students rotate the roles of facilitator and scribe and also play the parts of users and system developers.

The JAD workshops bring together much of the work done in the previous sessions. The workshops involve the need to practise good communication, group dynamics, interviewing and meeting techniques. The students were also taught about how to run effective JAD sessions, how to prepare for the session, the job of the facilitator, scribe and the other participants within the sessions, and how to document the sessions. Working and running the JAD sessions helps the students to experience some of the conflict situations, inconsistencies and uncertainties that they need to learn are associated with real requirements problems (Macaulay & Mylopoulos, 1995).

For the workshops (which in 2001 spanned three sessions) the students were divided into five groups, one for each of the white boards available in the classroom. The scenario details were divided among the students in the groups. For example, when modelling a Grocery store, each member of the group was given a short overall scenario and then one student was assigned as the person who works at the till, another who works in the store and a third who does stock control. Each of these people was given different information. The scenario did not separate knowledge of data and functions. The different “users” were also given parts of the scenario using different terminology for the same thing. For example, the word “item” was used for the person who works in the till and the one who did the stock control used “stock”. The students took turns being the facilitator who had to control the other students, ensure everyone participated and none dominated, make sure they stayed on the topic and modelled the scenario using use-case diagrams (for functions) and entity-relationship diagrams (for data) on the board. The scenarios were fairly detailed but some information had been left out and other information was hidden. The students had to handle conflict situations, try to find consensus and work with any difficult people within their group.

Assessment was done in the third workshop using peer evaluation. The students were asked to evaluate one another as facilitators and as group members according to criteria set up by the lecturer. Many of the skills that had been taught in previous sessions were assessed at this time.

The JAD workshops bring together most of the techniques and methods taught before and help the students to develop their problem-solving skills. Group dynamics play an important role and each student is given opportunities to facilitate the groups, thus improving their ability to work as a team member and to lead in a group situation. Some research has been done on using JAD sessions to help students learn (Thomas & de Villiers, 2001).

Presentations

Doing presentations is another important skills for IT developers. It is especially important for those who go into contracting positions. The students were expected to teach themselves PowerPoint, but were given some guidance about choice of colour, backgrounds, use of pictures, diagrams and charts as well as their body language while using the technology. They were taught about preparing, organising and delivering a presentation. The students were required to do a

presentation of five minutes on a topic of their choice and were assessed on issues like the organisation of the talk, the introduction and conclusion, their presentation style as well as their use of PowerPoint.

Analysis of the students' evaluation of the unit

The students' experiences of the unit were sought in order to help determine if they found the unit to be beneficial to them. It was felt to be important to ensure that they were not being taught skills that they already had, as well as to ensure that they understood the relevance of the unit. Table 1 gives a summary of the quantitative results from a questionnaire given to them at the end of the unit. The questionnaire asked them to rate each section as to whether it had been Very Beneficial, Beneficial or Not Beneficial to them. As one can see from the table the students were generally positive about the various aspects taught in the unit. If the students answered Very Beneficial, it was given a 10, Beneficial a 5 and Not Beneficial a 0 and these were averaged to get the mean. Only 75 of the 118 students completed the questionnaire giving a response rate of 64%.

The topics that were most beneficial, according to the students were JAD (mean of 8), Esteem and Assertiveness (7.47), Running Meetings (7.27), Interviewing (7.07) and doing presentations (7). The unit itself also received a fairly high rating (7.8). Those that the students found least beneficial were Writing (5.73), Communication (6.47) and Group Dynamics (6.53). In each of the topics, except Writing, there were less than 10% who felt that the topic was not beneficial. All the students felt that the JAD and the unit as a whole were Very Beneficial or Beneficial.

	N	Mean	Very Beneficial		Beneficial		Not Beneficial	
			N	%	N	%	N	%
Esteem & Assertiveness	74	7.47	41	55.4%	27	36.5%	6	8.1%
Writing	74	5.73	22	29.7%	39	52.7%	13	17.6%
Communication	75	6.47	28	37.3%	41	54.7%	6	8.0%
Interviewing	75	7.07	34	45.3%	38	50.7%	3	4.0%
Group dynamics	75	6.53	29	38.7%	40	53.3%	6	8.0%
Running meetings	74	7.27	37	50.0%	32	43.2%	5	6.8%
JAD	73	8	41	56.2%	43	43.8%	0	0.0%
Presentations	75	7	34	45.3%	37	49.3%	4	5.4%
Overview of unit	72	7.8	36	50.0%	36	50.0%	0	0.0%

Table 1: Quantitative summary of learners' experiences with the unit

Before looking at reasons why these results were found, it is important to integrate these results with the qualitative results obtained. These have been categorised in Table 2 and the answers given by more than one student are shown. The positive and negative comments have been divided in the table to make for easier identification and the total number of positive or negative comments for each topic is indicated in brackets.

Positive		Negative	
Self esteem and assertiveness			
Made me aware of whether I am passive, aggressive or assertive	4	Not relevant for me	3
Informative	4	Other negative comments	3
Learnt how to work with other people	2		
Made me feel more confident	2		
Helped those of us who are shy	2		
Other positive comments	9		
	(23)		(6)
Writing an academic paper			
Learnt to research a topic	6	Don't see the use of it	4
Need to be able to write a report for an organisation	5	It is like writing essays at school	3
Helped to write formally and in the right format	4	Other negative comments	4
Learnt to reference properly	3		
Enjoyed it	2		
Had not done this before at school	2		
Did not like it but it will probably be useful	2		
Other positive comments	6		
	(30)		(11)
Communication and multicultural communication			
Helped to understand people from other cultures	11	Did not learn anything I did not know before	2
Learn about working with other people	4	Multicultural needs to be deeper	2
Interesting	3	Other negative comments	0
Makes us more tolerant	2		
Needed for business	2		
Other positive comments	12		
	(34)		(4)
Interviewing			
Useful in real life (industry)	7	Negative comments	2
Learnt to plan and structure an interview	3		
Informative	3		
Learnt to ask the right questions	2		
Other positive comments	6		
	(21)		(2)
Group dynamics and negotiation			
Learnt to work in a team	6	Negative comments	2
Learnt how to negotiate with others	4		
Related to real life	3		
Learnt to work with other people	2		
Working in teams makes you more productive	2		
Helps you make better decisions	2		
Other positive comments	8		
	(27)		(2)
Meetings			
Need to run meetings in industry	5	Negative comments	2
Video was good	3		
Teaches you what is expected of you in a meeting	2		
Must have a goal and understand the goal	2		
Teaches you to have properly structured meetings	2		
Other positive comments	13		
	(27)		(2)
JAD			
Working with people	5	Got tired of it	4

Helps us in problem solving	4	Other negative comments	2
Useful for industry	4		
Helped us learn to design systems better	3		
Practical	3		
Enjoyable	3		
Learnt about ERDs	2		
Learnt to work in a group	2		
Learnt to reach consensus	2		
Learnt not to be domineering	2		
Other positive comments	6		
	(36)		(6)
Presentations			
Practise was helpful	8	Have done it before	2
Feel more confident to speak in front of others	8	Scary	2
Gave me skills for talking in public	4	Other negative comments	1
Need for industry	4		
Learnt to use visual effects to make presentation more interesting	3		
Learnt from other people's presentations	2		
Other positive comments	6		
	(35)		(5)
General			
Learnt a lot about how things really work in industry	13	Boring but I guess we will need the skills	2
Informative	5	Other negative comments	3
Enjoyable	5		
Interesting	2		
Not bad	2		
Other positive comments	8		
	(35)		(5)
TOTAL POSITIVE	268	TOTAL NEGATIVE	43

Table 2: Categorisation of qualitative comments

The following discussion draws from the results of the two tables as well as giving examples of some of the specific comments made by individuals about the topic.

Self-esteem and assertiveness

The self-esteem and assertiveness topic was felt to be second most beneficial to the students (mean of 7.46). They commented on how it made them aware of whether they themselves were passive, aggressive or assertive. One of them said *"You realise that you have a problem and that you can do something about it"*. Another said it helped them to become *"someone who is capable of handling people and challenges and being able to make the right decisions."* Overall there were 23 positive comments and 6 negative comments on this topic with the most common negative comment being that the topic was *"not relevant to me"*.

One of the students summed up by saying: *"Helps you perceive yourself in a positive way. Helps one to stand for his/her rights, needs and beliefs, not offending anyone in the process."* No changes were necessary for this topic.

Writing an academic paper

Writing an academic paper was the topic that the students disliked the most and also found to be the

least beneficial (5.733). Nevertheless, there were 30 positive comments and 6 negative ones in the qualitative analysis. On the positive side, some of the students saw that it might be beneficial when writing a report in industry and others felt that they had learnt to research a topic and write it up formally and in the correct form with proper referencing. Others felt that it was not something that they would ever use and that it was like writing an essay at school.

There are very few people who enjoy writing. As one student put it "*This was a nightmare.*" Most of the negativity, however, seemed to be due to the students not seeing its relevance. One student commented: "*In IT you do not always need to write an academic paper if you are a programmer or networks administrator.*" Writing is considered important for IT professionals as they need to be able to write proposals, document their systems and write motivations for management. Writing is also important for the rest of the student's academic career. It would seem that this topic could be better related to the IT work environment in order to make it more relevant to the students.

Communication and multicultural communication

While only 37.3% found this to be very beneficial, there were also only 8% who found it not to be beneficial. The students, in their comments, seem to have focussed on the multicultural communication and made comments about how it helped them to understand people from other cultures and how they learnt to work with other people. They also felt that it was interesting and would make them more tolerant. The students were from all of the different cultural groups found in the Eastern Cape region of South Africa. Their first language was either English, Afrikaans or Xhosa. One Xhosa-speaking student commented that it "*did benefit me but I think that some people from other cultures might have missed it*". Another student commented that they felt that it "*opens doors and knocks down barriers that have been keeping people from knowing and understanding one another.*" Two students commented that there needed to be more on the multicultural as it was too broad and only taught at the surface. Many of the students have not had opportunities for mixing with people from other cultures and it was good to hear that the course had helped one student to "*make friends with people of other cultures.*"

In 2002 this topic was expanded to include aspects of dealing with diversity in the form of gender, age, ethnicity, language, etc.

Interviewing

This topic was about interviewing users. It would seem that too little time was spent on this topic. Only one double lecture was allocated for both the theory and the role-playing exercise and the students did not seem to have learnt much from it. In a test, the students were asked to set up a semi-structured interview to interview one of the people who worked at the front counter of the Technikon library as the library wanted to change to an Internet-based system. The questions set up by the students showed little understanding of what it was hoped that they had learnt in the role-playing exercise.

The students themselves gave the interviewing section a fairly high rating (7.07) with 45.3% finding it very beneficial, 50.7% saying it was beneficial and only 4% finding it not beneficial. On the positive side people commented about its importance for industry and how it helped them learnt to structure an interview. On the negative side individuals made comments about needing more practice and how the techniques did not seem to be very practical.

It would seem from this that the topic was covered too superficially. More time for practising the

interviewing techniques should be given in the unit.

Group dynamics

The students' perception of the benefit of this skill was about the same as that for communication (6.53 average) with 38.7% finding it very beneficial, 53.3% beneficial and 8% thinking it was not beneficial. They commented on how they learnt to work as a team and to handle negotiations. Some of them commented that working in groups was more productive than working alone and that it helps you to make better decisions. One person said that they "*learnt to listen more than speaking and how to handle aggressive people and shy people.*" One also commented that it helped them learn to work with people from different cultures.

A study done in parallel with this one that investigated the students' ability to work in group projects suggested that the students needed to learn more about how to work effectively in teams and how to overcome some of the problems that teams experience.

Running meetings

Running meetings was also rated quite highly by the students (mean of 7.27). Three of the students commented on the video being good. The video depicted a problem-solving meeting and showed the various techniques and methods that can be used in such a meeting. Some students commented that they had learnt what to expect in a meeting, that the meeting should have a goal that is understood by all and how to structure a meeting. One of the students said: "*I always thought were (sic) just about getting together with top management and keeping quiet.*" On the negative side one said that there was too much theory and not enough practical.

The only aspect of this part of the unit that it was felt needed to be expanded was in the writing of minutes. Problems in the students' ability to take notes and write minutes were exposed in the sections on interviewing and in the JAD sessions.

JAD

The JAD sessions were felt to be the most beneficial by the students (mean of 8). There were 56.2% who found it very beneficial and no students felt that it was not beneficial.

The students enjoyed working with other people. They felt that it helped in problem solving and designing good systems and would be useful in industry. One student said it helped them learn not to be domineering and another said they learnt not to be passive. One student said that it was "*perfect for this course.*" The main negative comment seemed to be that there were too many sessions – three in total.

The JAD was also found to be useful by the lecturer as it offered an opportunity for the students to practise and be assessed on the integration of the skills that they had previously learned. No changes are envisaged for this section of the work.

Presentations

The students gave this an average score of 7, which is about in the middle of the scores for the different topics. There were 45.3% who found it very beneficial, 49.3% who found it beneficial and 5.4% who did not find it beneficial. Students commented that the practice was helpful and that they feel that they have the skills to speak in public. Many said that they felt more confident to speak in front of others. Some commented on how they learnt to use PowerPoint to make their presentations more interesting. One said: "*This was a nerve-racking experience but an*

important skill to have! The practice was helpful.” There were some that felt that they had done it before and it was not useful to them.

Overall impressions of the unit

Overall there were 243 positive comments about the unit and 43 negative. Although only the JAD had a mean of more than 7.8, the unit itself got a rating of 7.8 from the students. The students were asked what they felt that they had learnt from the unit. The students' major comment was about how they learnt a lot about how things will work in industry. Many found it informative and enjoyable. One said that it was “mind opening”, while another said: “*This is a wonderful course. It was very enjoyable and there was a good atmosphere in the class. It improved my confidence and groupwork skills dramatically.*”

The students were also asked what they felt should be changed in the unit. There were no comments made by more than one person. Individuals said that there needed to be more practice in taking minutes at meetings, they should have workshops to get to know other cultures better and that job-hunting skills should be included. One even suggested that they needed more writing assignments and research.

Reflection

In a course of this nature, the students' experiences are very important. Many of the activities involved workshops, role playing and group activities where the students needed to have the self-confidence to participate. In a developing country like South Africa, this can be particularly difficult as the students come from such diverse backgrounds and schooling. Encouraging them to take part and build up to taking the lead in JAD sessions and do a presentation in front of their classmates is important preparation for their job in industry.

The students' qualitative and quantitative evaluations of the parts of the course show that they found the more IT-related topics to be the most beneficial. While students are not always aware of what is important and what is not, it is interesting to note that all the aspects covered, except writing, were thought to be beneficial or very beneficial by more than 90% of the students. The Writing was geared towards teaching the students how to write an academic paper, rather than a report for industry. This change might help students feel that it was more relevant to them.

Another place where problems were found was in the Interviewing. It is difficult to try to simulate interviewing methods within the classroom and many of the students still had difficulties with the concepts at the time of the test. Some of the students also felt that the issues around multicultural issues were handled too superficially. How these aspects can be improved is currently under investigation and some ideas have been implemented in 2002.

Overall, it would seem that the unit was successful in helping students to learn the communications and interpersonal skills that they need, while also showing them how these are used in industry. One unit cannot be effective on its own, however. Every other unit within the course needs to foster and assess these skills, integrating them into their outcomes and assessments.

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