The Development and Implementation of Teaching Quality Assurance Strategies within a Bachelor of Information Technology Degree

S Weal, B Calway, K Heskin, G Murphy, C Pilgram, R Sharma, A Hulls and R Vasudeva

Introduction

The emerging importance of teaching quality assurance as an issue within Australia became noticeable during the latter part of 1991. Work has been going on prior to this but much of this was due to the initiatives of individuals and institutions rather than a more global involvement. Certainly the publication of the Higher Education Council's *Higher Education. Achieving Quality*[1] helped to push teaching quality assurance to the forefront. Since then other reports such as the one by Piper[2] have helped to give the issue more prominence. The Federal Government's funding initiative has certainly ensured that all institutions in the higher education sector should be giving high priority to quality assurance related activities within their organisation.

Quality itself remains an elusive term particularly when applied to higher education. The Foley report of the 'Review of Standards, Accreditation, Quality Control and Assurance'[3] reported that quality is seen as: *The subjective and objective attributes of a product or service which satisfy customers' expectations and perceptions at the time of purchase and during the useable life of the product or service.*

Although there is debate on quality in higher education, quality can be seen as 'fitness for purpose'. This is the definition that has been commonly accepted across the wider Swinburne community. In 1992 Swinburne successfully gained a grant from the DEET National Priority (Reserve) Fund to develop and implement strategies for assuring teaching quality within its Bachelor of Information Technology degree program. The staff, the students and industry were identified as being the major stakeholders in the program. This paper will discuss the project in some detail and outline its progress to date.

Project Objectives

The objectives of the project were to:

- identify generic and specific/discipline skill requirements from the perspective of the stakeholders;
- identify appropriate teaching quality mechanisms for the development of such skills;
- implement the recommended quality assurance mechanisms on a trial basis and to develop generalisations to be used not only across Swinburne University of Technology, but throughout the Unified National System of higher education, particularly for comparable Bachelor of Information Technology (BIT) programs;

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[1] Higher Education Council (1992) *Higher Education: Achieving Quality.* Canberra: Australian Government Publishing Service.

[2] Piper, DW (1993) *Quality Management in Universities.* Canberra: Australian Government Publishing Service.

[3] Foley, KJ (1987) *Report of the Committee of Standards, Accreditation, Quality Control and Assurance.* Canberra: Australian Government Publishing Service.

- undertake staff development in the application of quality measures and mechanisms;
- assess quality mechanisms with respect to academic support areas including the Library, the Computer Centre and other Learning Services;
- disseminate the project's findings across the system as a whole.

Why the Bachelor of Information Technology Degree?

There were several good reasons for selecting the BIT program which included:

- the BIT is an inter-faculty course which has major input from five departments. Quality measures developed for this program would therefore impact more widely across the entire Swinburne community;
- the strong industry involvement in the BIT program should ensure regular and ongoing feedback from industry, which is one of the major external stakeholders;
- the Swinburne BIT program is a member of the National Pilot Program in Co-operative Education in Information Technology and, as such, is in a position to share the findings of the project with the other universities involved;
- information technology is regarded as a national priority discipline; and
- the 1992 Discipline Review Committee[4] recommended the establishment of a National Centre for Teaching Excellence with Information Technology as a priority area and also advocated funding support for pilot quality assurance schemes across a number of institutions.

Aims of the BIT program

In endeavouring to gauge the success or otherwise of any program it is important to determine what the goals and objectives of the program are. Failure to do so will mean that there will be nothing to measure against. The BIT program aims to provide students with an opportunity to develop the abilities and skills important for effective participation's and leadership in industry and commerce. This is to be achieved through a combination of university-based education, industry-based learning and extracurricular activities. More specifically, the aims of the BIT program can be broadly summarised as follows:

- to produce IT graduates with a strong blending of IT, business, communication and leadership skills;
- to involve industry so as to ensure relevance of curriculum and to provide an environment in which theory and practice can be related; and
- to attract high calibre students and challenge them with a demanding and intensive course, ensuring academic and personal development.

Methodology

The project is being undertaken by four major sub-groups. The first of these is investigating the generic and specific skill requirements. The second is identifying possible mechanisms for use within the BIT whilst the third is looking at the implementation of these mechanisms. The final sub-group is looking at identifying mechanisms for implementation in the support areas. The sub-groups meet on a regular basis to discuss progress and to exchange information. The activities being undertaken by each of the sub-groups will now be discussed in more detail.

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[4] Discipline Review Committee (1992) *Discipline Review of Computing Studies and Information Sciences Education.* Canberra: Australian Government Publishing Service.

Sub-Group I : Generic and specific skill requirements

This sub-group is examining the views of BIT stakeholders with regard to skill requirements in order to determine:

- what their priorities are in terms of generic skills; and
- the extent to which they perceive Swinburne BIT students as possessing these skills.

All stakeholders were surveyed using a questionnaire which was developed on the basis of a previous pilot study used to measure stakeholders' perceptions of generic skills requirements. In addition, stakeholders were asked open-ended questions to gauge their views on the strengths and weaknesses of the BIT program. The research thus has both quantitative and qualitative aspects as befits the assessment of a complex and multi-faceted 'service' to stakeholders.

The issue of generic skills has been highlighted by the Higher Education Council in its *Higher Education: Achieving Quality*. The HEC believes that the acquisition of generic skills, defined as 'skills, personal attributes and values which should be acquired by all graduates regardless of their discipline' , is basic to the achievement of a quality higher education system. The HEC indicated that the generic and transferable skills 'should represent the central achievements of higher education as a process'. This is so because discipline-specific skills often have a short life and graduates are much more likely to change jobs and retrain that has ever been the case in the past. It is for this reason that this project has decided to focus on generic skills as an important aspect of attempting to measure and maintain or improve the quality of outcomes within the BIT program.

The pilot study, which looked at a sample of students, staff and employers across a range of faculties and disciplines, highlighted some interesting differences in priorities between these stakeholders. For example, the traditional generic skill, writing, was more highly valued by academic staff and employers than by students, who sometimes get annoyed that academic staff make comment on their writing skills. they perceive themselves to he budding engineers, scientists and the like who have better things to do than worry about grammar, spelling or syntax in their reports. This illustrates that the issue of generic skills is a complex one which can not focus on one stakeholder in isolation from others and that feedback from individual stakeholders may not provide the best guide to practice in particular cases.

There is a paper being presented at this conference which will discuss the results of the pilot study in more detail. (see Ng, Sharma and Heskin[5])

The results from the BIT generic skills survey are currently being analysed and the project will be looking at the perspective's of the various stakeholders in an effort to determine the different generic skills agendas in operation; assess stakeholders opinions of the Swinburne BIT program's current achievements, strengths and weaknesses; and determine the best way forward in terms of generic skills objectives.

Sub-Group II: Identifying possible mechanisms

There has been considerable work to date on performance measures and quality mechanisms within the higher education sector. Some of the more useful references include the work by Cave,[6] the Hunter Report,[7] Johnes and Taylor,[8] the Linke Report,[9] Moses,[10] and Piper. The work in this area is centred around six main functions within the BIT program.

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[5] Ng, GC, Sharma, R and Heskin K (1993) *Assessing Outcomes of a University Study: A Pilot Study*. Paper presented to the 4th International Conference of the Australasian Association for Institutional Research.

[6] Cave, M, Hanney, S, Kogan, M and Trevett, G (1988) *The Use of Performance Indicators in Higher Education*. London: Jessica Kingsley.

[7] Hudson HR (1986) *Review of Efficiency and Effectiveness in Higher Education*. Canberra: Australian Government Publishing Service.

[8] Johnes, J and Taylor, J (1990) *Performance Indicators in Higher Education*. Buckingham SRHE and Open University Press

[9] Linke, RD (1991) *Performance Indicators in Higher Education*. Canberra: Australian Government Publishing Service.

[10] Moses, I (1988) *Academic Staff Evaluation and Development: A University Case Study*. St Lucia: University of Queensland Press.

These are selection, teaching industry-based learning, management, extra-curricular activities and post-graduation. In each case an attempt is being made to identify mechanisms and measures that will help gauge the success or otherwise of each of the functions in terms of helping the BIT program to achieve its overall goals and objectives. Progress has primarily been made in each of the first four functions to date although an attempt has been made to identify existing measures and mechanisms for all of the functions. Each of the first four functions will now be looked at in more detail.

Selection

Students entering the BIT program are selected not only on the basis of their Victorian Certificate of Education (VCE) results but on their performance at an interview as well. Indeed, any prospective student who performs badly at the interview will hot be selected for the program regardless of how good their VCE results are. The selection process has been discussed with the Program Manager, the Selection Officer, and a sample of BIT students with a view to determining what the critical success factors are for the process. A number of issues have been identified to date. These include a need to clearly document the selection process and a need to ensure that each of the interviewing panel is briefed and debriefed to ensure that their ratings of students is similar.

Possible measures for the institution in this area include consistency of scoring between interview panels, number of students who subsequently revise their performance for Swinburne BIT in an upwards/downwards direction, number of students who rank Swinburne BIT as first preference, the percentage of offers accepted, the number of students who drop out from the course and the number of employers or sponsors who are willing to participate in the selection process. The latter is an important consideration as the BIT relies heavily on industry input because of the nature of the program.

Teaching

This is the major area of work for this sub-group. The success or otherwise of the teaching function is vital to the overall success of any program. Poorly designed and/or poorly delivered programs can result in dissatisfaction being experienced by the three major stakeholder groups - students, staff and employers.

In investigating the various mechanisms and measures that might be used an attempt is being made to male a selection that will look at the process itself as well as the resultant output.

All staff plus a selection of students have been approached in order to gain their views on what is currently happening in this area along with what should happen. One clear fact to emerge from these discussions has been that not everybody has a clear understanding of the goals and objectives of the BIT program. It can be said that at this stage one of the recommendations of the sub-group will be that appropriate information booklets should be prepared for both staff and students and that both groups should be briefed when they first become involved in the program. It is envisaged that the booklets would include a code of teaching practice which will take into account information contained in documents such as those prepared by the AVCC[11] and HERDSA.[12]

Other mechanisms under consideration include workload assessment, unit panel meetings between teaching staff and student representatives, a two-level system of student evaluation surveys, end of segment panel meetings between unit convenors to discuss the conduct of units and the results obtained, unit cluster meetings involving staff from clusters of like units and peer assessment. One of the major criticisms from staff and students of the current system of student evaluation surveys is the lengths of time required before feedback is made available. The subgroup is looking at ways of streamlining the process. Another major mechanism to be reviewed is the existing program accreditation procedure.

An attempt is being made to look at measures that reflect not only output but process as well. The measures under consideration include student attrition rates, student progression rates, student

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[11] AVCC (1993) *Guidelines for Effecive University Teaching.* Canberra: Australian Government Publishing Service.
[12] HERDSA (1992) *Challenging Conceptions of Teaching: Some Prompts for Good Practice.* Campbelltown: HERDSA.

completion rates, comparison of frequency distributions not only with past years but against performance in similar units in other degree programs, student evaluation related measures and value-added measures.

Industry Based Learning

All of the students involved in the BIT program have two industry-based learning placements during the course of their studies. There are several factors involved in this process including student preparation, placement, supervision, reporting and debriefing. A review of this function is currently being undertaken by an external consultant. This review will include a review and evaluation of measures that are currently being used to evaluate the success of this function. These include the willingness of sponsors to continue in the industry-based learning function, the degree of satisfaction expressed by students, the number of complaints received, the amount of time taken to place all students and the number of job offers subsequently made to graduates.

Management

The work is this area has mainly concerned an attempt to establish a suitable change management mechanism to help ensure that future changes are made in a systematic and orderly manner and that the steps involved are properly documented for future references. The BIT has a number of Committees which manage and review its operation.

Each of these will be looked at. Possible measures for adoption in this area are still being examined.

Sub-Group III : Implementation of mechanisms

The work completed by this sub-group has been somewhat restricted to date, as it will rely heavily on the findings of the first two sub-groups. Nevertheless it has undertaken two major tasks. The first of these is the commencement of a series of 'quality awareness' seminars for staff involved in the program. The second has been to conduct an ISP 9000 diagnostic audition the BIT program. A number of colleges in the UK have gone down this track. The paper by Collins, Cockburn and MacRobert[13] details this approach as applied to Sandwell College which was the first college to gain accreditation against the ISO standard.

The results of the diagnostic audit for the BIT program revealed that:

- macro level mechanisms are in place and operative down to the level of Head of Department;
- the infrastructure requirements of the standard appear to be in place, documented and operational at the higher levels of Swinburne; and
- at the lecturer levels the 'academic freedom' issues have resulted in little formal process operation and documentation.

It should be noted that the survey, which has resulted in raising a number of questions that are now being examined, was conducted not with a view to recommending ISO 9000 as the way ahead for the BIT but rather as an evaluation of how much work would be required if this approach was favoured. It also enabled the project team to gain sonic first hand experience of an academic unit.

Sub-Group IV: Identifying mechanisms for support areas

External consultants were engaged to assess quality mechanisms with respect to academic support areas including the library, computer centre and other learning services used in the BIT program. In connection with this project it was seen that the academic support areas have a significant role to play in the development of graduates in areas such as effective communication, collection and management of information from a wide range of resources and ill enhancing critical thinking and decision-making abilities.

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[13] Collins, D, Cockburn, M and MacRobert, I (1991) "Sandwell College: Provider of quality assured education", *Quality Forum*, vol. 17, no. 3, 126-128.

Initially the methodology involved working with staff in the academic support areas in quality awareness sessions. It was found necessary to conduct these discussions prior to obtaining data for the development of performance indicators in the support areas. To obtain definite information on the strengths and deficiencies of the services currently offered, it was considered essential to obtain data from both students and staff of the BIT program. As a consequence, a questionnaire was developed for academic staff and for students involved in the BIT program.

Analysis of the data is currently being undertaken. The nature of the questionnaires enables a comparison between priority and performance assessments of the services by students and staff. Where the priority is high but the performance low, it should alert management to a likely need for improved performances in these particular areas. Although areas of strength and weakness are identified, they may require consideration of the reason for some results before remedial action is taken.

The survey will also provide the ranking order of the services in each of the areas through the priority assessments. In addition to this data the use of performance indicators in each of the areas will assist in the improvement of services and services and utilisation of facilities. The support areas can develop their own performance indicators with an emphasis on customer orientation.

Intended Outcomes

The project still has some way to run before findings and recommendations are made. However, it is possible at this stage to list the major, intended outcomes for the project which are:

- the identification of generic skills from the perspective of the stakeholders in higher education;
- the development of a series of quality measures and mechanisms for use in teaching departments and academic support units;
- the implementation and evaluation of quality measures and mechanisms into the BIT program at Swinburne with the provision of consequential advice to other providers of BIT programs via the National Committee on Co-operative Education in Information Technology;
- the development and delivery across Swinburne a number of staff development workshops and seminars;
- an increase in the level of awareness of quality-related issues across Swinburne.