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## Integration of ITIL into the IS Curriculum

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### Abstract

*The Information Technology Infrastructure Library (ITIL) has seen phenomenal growth in organisations in the last three years for managing IT services, with a majority of IT departments using ITIL. This paper presents the integration of ITIL into an Information Systems undergraduate curriculum. A certification model is discussed that allows students to gain the ITIL Foundations Certificate. Student feedback suggests that the inclusion of ITIL has led to positive employment outcomes and perceptions of industry relevance of subjects.*

### Keywords

ITIL, IT Service Management, ICT Education, Curriculum Development

### INTRODUCTION

This paper describes the introduction of IT service management concepts and practices into an undergraduate degree at Victoria University in Melbourne, especially the inclusion of the best practice approach of the Information Technology Infrastructure Library (ITIL) guidelines. Curriculum considerations and student feedback regarding the subjects and ITIL is discussed.

The Bachelor of Business (Computer Systems Management) is delivered in Melbourne and Hong Kong. The degree commenced in 1997. Many students from the degree gain their first position in service desk, network or technical support areas. Hence to address employment outcomes for students it seemed essential to provide them with industry relevant service management concepts and skills.

According to OGC (2006) "ITIL is the most widely accepted approach to IT service management in the world". The growth in ITIL implementation and ITIL training has been significant with much of the escalation taking place this century. In-house approaches to IT service management are being replaced with standard methodologies such as ITIL. An INS survey in 2006 indicates from its respondents that in-house developed practices have shifted from being more than double those using ITIL practices (34%) in 2004 to now being about the same at around 52% now using ITIL (Blum, 2006). Reflecting the increase in ITIL adoption for large organisations, Davis (2006) states, "According to Forrester Research, ITIL adoption among 1billion USD+ revenue companies has increased substantially in the past year. The number is projected to reach 80% within global 2000 companies by 2010". The growth of ITIL and IT Service Management (ITSM) can be seen in the wealth of documentation available on ITIL compared to five years ago. It was noted by Potgieter et al. (2004) that, "Very little academic material exists on ICT Service Management Best Practice". In Australia, the increase in attendances at IT service management conferences such as itSMF demonstrates the growth of the importance of managing IT services (itSMF Australia, 2006; itSMF Australia Bulletin, 2006). Casual observation by the author from attending many industry seminars and briefings indicates the shift in ITSM maturity and vendor perspectives from "What is ITIL" to "how to incorporate, improve and mature ITIL processes", so we are now seeing a maturity of ITIL practices in industry.

The increasing adoption of ITIL practices for managing IT services in organisations and the desire to provide students with an employment edge prompted the inclusion of ITIL into the Computer Systems Management degree.

Student's perceptions and feedback were gained through subject evaluations, student email feedback, unsolicited student comments and observation.

## BACKGROUND

### ITIL Overview

ITIL is a best practice process-based set of guidelines for managing information technology services which were developed in the 1980s by the CCTA Central Computer and Telecommunications Agency in the United Kingdom. The agency in 2001 amalgamated with the Office for Government Commerce (von Bon, 2002). ITIL comprises of a number of sets (publications), the main sets being: Service Support; Service Delivery; The Business Perspective; ICT Infrastructure Management; Application Management; and Security Management. The interrelationship between these is shown in figure 1. The most widely adopted ITIL processes are from the Service Support and Service Delivery sets.

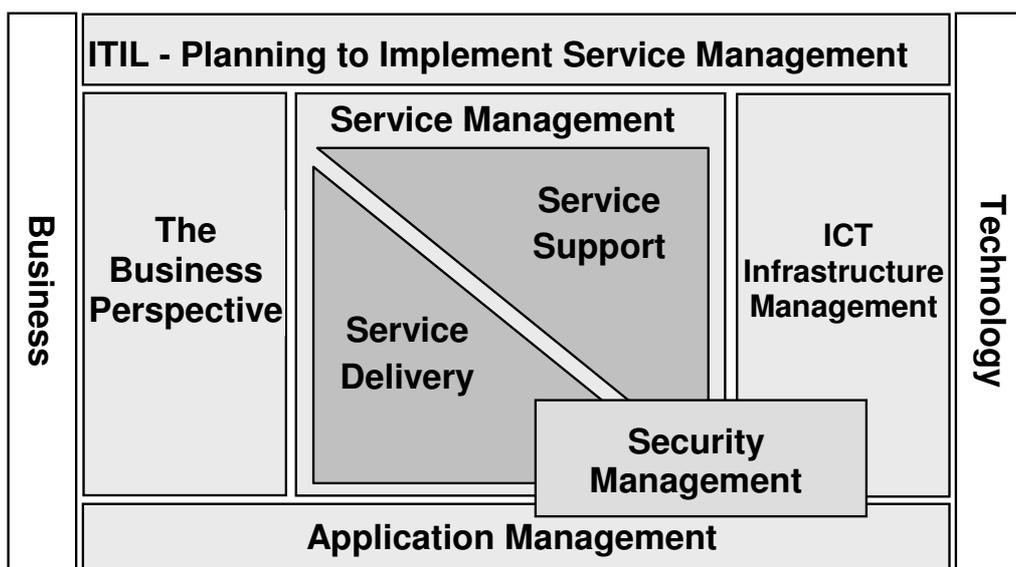


Figure 1: ITIL Publication Framework (Macfarlane & Rudd, 2001)

### Computer Systems Management Degree Structure

The Bachelor of Business (Computer Systems Management) degree consists of 24 subjects, organised into a structure that comprises 8 common core subjects, 8 specialisation/support subjects and 8 elective subjects. The structure is regulated in this format for all Faculty of Business and Law business degrees.

- 8 Common Core Business Subjects which all business students undertake and provides a common business grounding.
  - Information Systems for Business
  - Accounting for Decision Making
  - Business Law
  - Microeconomic Principles
  - Macroeconomic Principles
  - Business Statistics
  - Introduction to Marketing
  - Management and Organization Behaviour
- 6 Specialisation Subjects for the Computer Systems Management Specialisation
  - Introduction to Programming
  - Introduction to Business Systems Development
  - Systems Analysis and Design
  - Database Systems
  - Computer Systems

- Managing Network Integration
- 2 Support Subjects from these three to complete the Computer Systems Management specialisation
  - Managing the Computing Environment (*strong ITIL component/theme*)
  - Managing Systems Development (*some PRINCE2*)
  - Contemporary Developments in IS (*ITIL topic options*)
- 8 Elective Subjects. Most in the degree students complete the following electives
  - Computing Practice (*ITIL component*)
  - Managing IT Service Support (*very strong ITIL Service Support component*)
  - The Information Professional (needed for ACS accreditation)
  - Computer Project (*possible ITIL based projects*)
  - Work Integrated Learning Studies, 2 subjects over one-year (*possible ITIL in practice*)

## INTEGRATION OF ITIL IN SUBJECTS

The impetus to integrate ITIL into teaching arose in 2000 from taking students on a site visit to an IS department that was introducing ITIL. The IT manager gave a presentation to the students on how the company was developing its service catalog, improving incident management processes based on ITIL and moving to introduce other ITIL processes. ITIL processes have now been introduced into a number of subjects. Figure 2 shows the mapping of these subjects to the ITIL framework indicating the subjects that include ITIL and where the ITIL focus is in the subject.

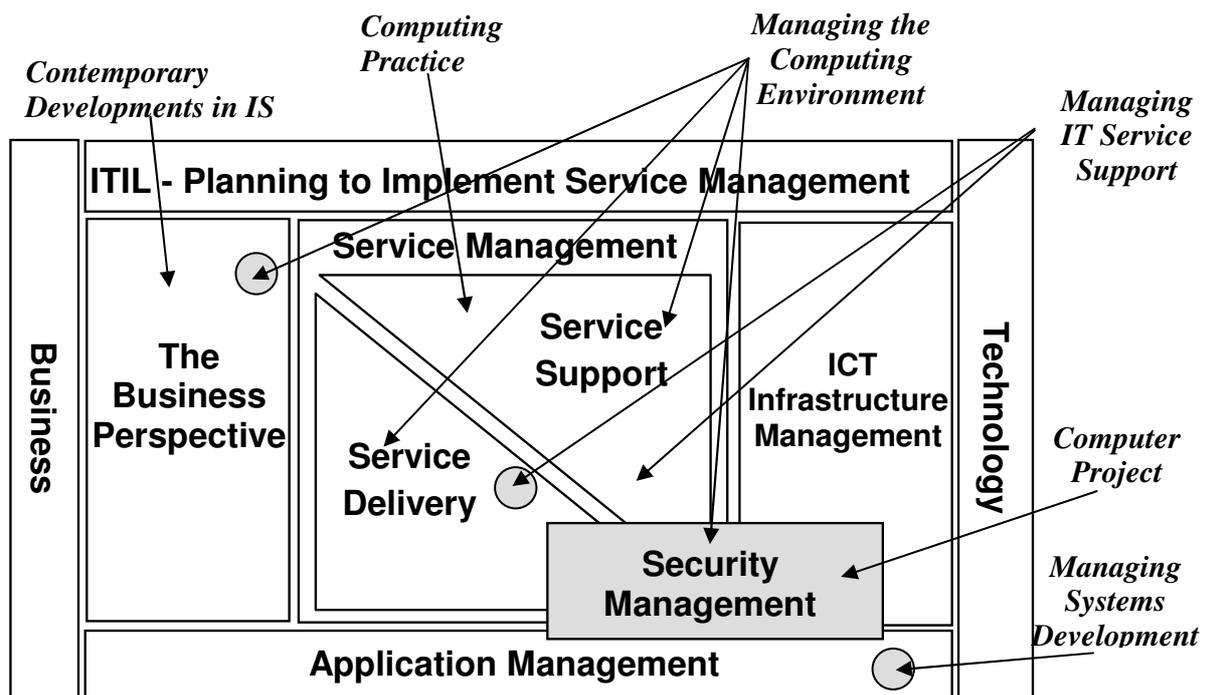


Figure 2: Mapping subjects to the ITIL Framework

### Managing the Computing Environment

Managing the Computing Environment has been conducted since 1997 and was the first subject that ITIL concepts were introduced into in 2000. ITIL mapped easily into the existing topic areas of the subject. This is the first subject that Computer Systems Management students undertake that exposes them to ITIL and is taken by second-year students.

The subject aims to provide students with the skills necessary to plan the purchase of new/replacement equipment, cater for change in computing hardware and software, determine organisational standards, plan strategic changes, monitor system performance, prioritise system developments, and allocate resources effectively.

The topics covered are: IS Environment; IS Structures; The IS Manager and IS HRM; ITIL Framework.; Financial Management for IT; Purchasing of hardware and software; Outsourcing, Information technology steering committees, Efficiency and effectiveness of IT; Managing and supporting users; Configuration Management; Managing Security; and, Managing Change.

### **Computing Practice**

This subject seeks to create a learning environment blending theory and practice which nurture and encourage the student's capacity to develop and consolidate: professional skills; identification of potential job options; an understanding of his or her ultimate contributions to the field; and contacts in the field.

The subject content includes: The nature of work in the Information Communications Technology (ICT) industry; Concepts embodied in the "Help Desk"; Systems Management; and Preventive Maintenance; Help Desk Management & Operations; Training and certification; Professional Communication and working with User Groups.

Topics covered: Resume Writing, Job Applications and Business Correspondence Considerations; Introduction to Help Desk Operations; Introduction to ITIL; Running an effective help desk; From Help Desk to Service Centre, the changing role of help desk; Management of a help desk/Staffing the Help Desk; Software Tools available for the Help Desk; People skills the importance of communication; Customer Relationship Management (CRM); Outsourcing & Application Service Providers implications for Help Desks; Am I a Help Desk Professional; Certification.

The strengths in this work integrated learning subject where students have to complete a minimum placement of 80 hours are: Adding Value to degree programs; Work related experience; Practical rather than just theoretical focus; Opportunity to make Industry contacts; Work Placement targeted to local organisation needs; Industry liaison opportunities; Potential employment advantages for graduates; Forerunner of future requirement for all subjects to have a work integrated learning component

A preliminary survey of the placement organisations indicates very little ITIL awareness.

### **Managing Systems Development**

This subject has a strong emphasis on project management and introduces students to the Prince 2 methodology. The subject co-ordinator has obtained Prince 2 and ITIL certification. Changes in the re-development of the subject are currently taking place.

### **Contemporary Developments in Information Systems**

Students investigate and write an academic paper on an area of interest. Students are now encouraged to investigate ITIL and have chosen and completed papers in ITIL related topics in Business IT alignment with ITIL and, ITIL and its impact on IT.

### **Computer Project**

This is a typical IS capstone subject, however students undertaking the Computer Systems Management degree have undertaken projects that may not be in application development. A project group in 2005 used ITIL Security Management guidelines as the basis for performing a security audit and assessment in an organisation. Another project involved the implementation of a server, the installation of an ITIL compliant version of CA Service Desk and production of an ITIL compliant training manual.

### **Managing IT Service Support**

This is the newest subject to be developed and commenced in 2005. It aims to give students a theoretical, practical and best practice approach to managing IT service support directly based on ITIL guidelines. It is intended for final year students.

The topics include: Introduction; Overview of IT management processes; ITIL Processes - Incident Management; ITIL Processes - Problem Management; ITIL Processes - Configuration Management; ITIL Processes - Change Management; Managing IT Customer Relations; IT Service Management Issues - Site Visit or Guest Speaker ; IT Tools for managing support; Performance measurement and reporting; IT Support as a profession.

Managing IT Service Support is intended to give students practical experience and is therefore structured as a one-hour lecture and a two-hour workshop per week. The workshop is structured so as incorporate about one-hour of service support activities and one hour of hands-on use of an ITIL compliant service desk management application.

Skills development feedback from students:

“... a real benefit for me as it has made me understand the concepts of IT Service Desks more extensively. With the course, concentrating on the ITIL concepts, it has made me realise on how vital it is all the processes fit in for a successful service desk... The structure of the course is really well set as the lectures give us a theoretical insight on Help Desk and ITIL concepts and the workshops aid in giving us a practical understanding of how the theory is put in to practice” (Anon 3).

“The assignments in this subject are fairly difficult for someone who doesn't know much about service support, ITIL, RFP's and writing up business documents. That's why being a 2nd year or 3rd year student is necessary in this subject, in order to use what you have learnt in other subjects and use some of that knowledge in this subject” (Anon 4).

Students from the Schools' other IS courses are undertaking Managing IT Service Support as an elective to gain an employment edge as many of the these students are looking to undertake one-year Work Integrated Learning (WIL) placements and they have observed that employers of WIL students are advertising knowledge of ITIL in the placement positions. The School's WIL Officer has also been suggesting to students that they strategically look at doing an ITIL subject to increase their placement chances. We have received feedback from the WIL Officer that some students have specifically gained placements in organisations that wanted students with ITIL knowledge.

Job related feedback from students:

“Having some knowledge of this software [CA Unicenter ServicePlus Service Desk], I have gained a Co-Operative Education position at Victoria University for 2006... Many times in interviews I am given a scenario where 2 or more clients are requesting for your help. And I never really answered this correctly. With the help of ITIL, I can now confidently answer these types of questions by explaining the impact, urgency and priority of each clients situation and how it will effect the business.” (Anon 4)

“in the interview they mentioned they were interested in what I was doing in BCO3001 and ITIL” (Anon 2)

“The fact that ITIL is a thing that is getting adopted by industry today & is going to be relevant or should I say important to be more employable” (Anon 6).

The vast majority of students have made general comments that indicate positive experiences in Managing IT Service Support which overall was rated at over 4 out of 5 by the students. Typical of many students responses are the following:

- Learning about ITIL
- Hands-on experience
  - “using CA gave me a good insight of a help desk”
  - “Great tool! Helps understand the content of the theory work”
- Creating SLAs and RFPs [Service Level Agreements and Requests for Proposals]
- Gained new knowledge
  - “better understanding on the concepts of what is involved in service support”
  - “expanded my knowledge in service support in knowing other areas in which is invisible to many general users”
  - “good understanding of ITIL from top to bottom”
- Enjoyed the subject
  - “Really rewarding experience, this subject will benefit my skills in IT”

We have received comments from two students who have taken ITIL into the organisation they have commenced work for and have helped initiate change towards the implementation of ITIL processes. This is a pleasing result as it indicates proactiveness into the industry by students of the learned in their degree.

Finally the Schools' Course Advisory Committee has been impressed by the introduction of ITIL into the degree.

## **INDUSTRY PARTNERSHIPS**

To ensure industry relevance and certification provision for ITIL two key industry partnerships have been formed. These partnerships were commenced 2004.

### **Computer Associates**

Through a formal Academic Partner Program, Computer Associates (CA) software is provided free. Currently we are using CA Unicenter ServicePlus Service Desk v6. We are looking to implement CA Service Desk v11, Knowledge Base and Dashboard for 2007 and have begun trialling this version. Usage of CA Service Desk by students is seen to be one of the most stimulating aspects of Managing IT Service Support.

Guest speakers have been provided from CA and have rated at close to 5 out of 5 for the content and satisfaction of the presentation.

The Partner Program allows for two staff to attend CA training courses for free if there is space in a course. To date two staff members have attended introductory courses and the administration course. This has assisted in preparing workshops and exercises for students and with administration of student accounts.

The CA Education Director signs the student's certificates for the subject Managing IT Service Support (appendix 1).

### **The Art of Service**

The Art of Service was one of the only companies in Australia in 2003 to offer an ITIL Foundation Certificate on-line. After making contact with a director at a TAOS seminar and follow-up via phone and email an arrangement was agreed that provided the on-line course to students at a reduced cost (~\$200AUD). Students can sign-up and pay for the course at the specially created web page by TOAS for VU students. (<http://theartofservice.com/ITIL-news/ITIL/ITIL-in-Australia.html>). The cost of ITIL exam is \$275 and is conducted at the external body authorised examination centres.

## **CERTIFICATION MODEL**

This section discusses the certification model adopted to encourage students to gain the ITIL Foundations Certificate by e-learning through The Art of Service alongside subjects that include ITIL processes.

We try to encourage students to consider gaining the ITIL certification as adding value to the degree and giving them an employment edge. The on-line course with the Art of Service involves about 18 to 22 hours work to go through the content. We have been advising students to undertake the on-line course alongside or in parallel with subjects that include ITIL processes as we believe this will match in with current studies and they can dialogue with staff members regarding their e-learning component. A number of certification models in university programs have been explored by Stein et al. (2005) with this ITIL certification model fitting into their inclusive and end-on model.

The overall benefits and weaknesses of certification programs claim by Stein et al. (2005) are: Adding Value to degree programs; Work related experience; Practical rather than just theoretical focus; "Up-to-Date" nature of certification programs; Specific targeted content very relevant to employers; Industry liaison opportunities; Adjunct to education programs offering verifiable testing of skills and knowledge; and, Potential employment advantages for graduates. The weaknesses by Stein et al. are seen as: Exist to support training industry; Proprietary nature; Lack of educational rigour/accountability; Often lacks "real-world" experience; Industry partnership inadequate or unstable; Too focussed; Excludes experiential knowledge; Training oriented rather than education oriented; "Value-for-Money" ignorance of certification; and, Too market driven, not knowledge driven

The specific benefits for students in gaining the ITIL Foundation Certification in the degree are: Adding Value to degree programs; "Up-to-Date" certification qualification; specific targeted content very relevant to employers; adjunct to education programs offering verifiable testing of skills and knowledge; and, potential employment advantages for graduates. As an example of this advantage a student reported that in an interview "[the employer] was particularly impressed with the fact that I'd undertaken the BCO3001 - Managing Service Support subject, and that I'm still currently trying to obtain my ITIL certification."

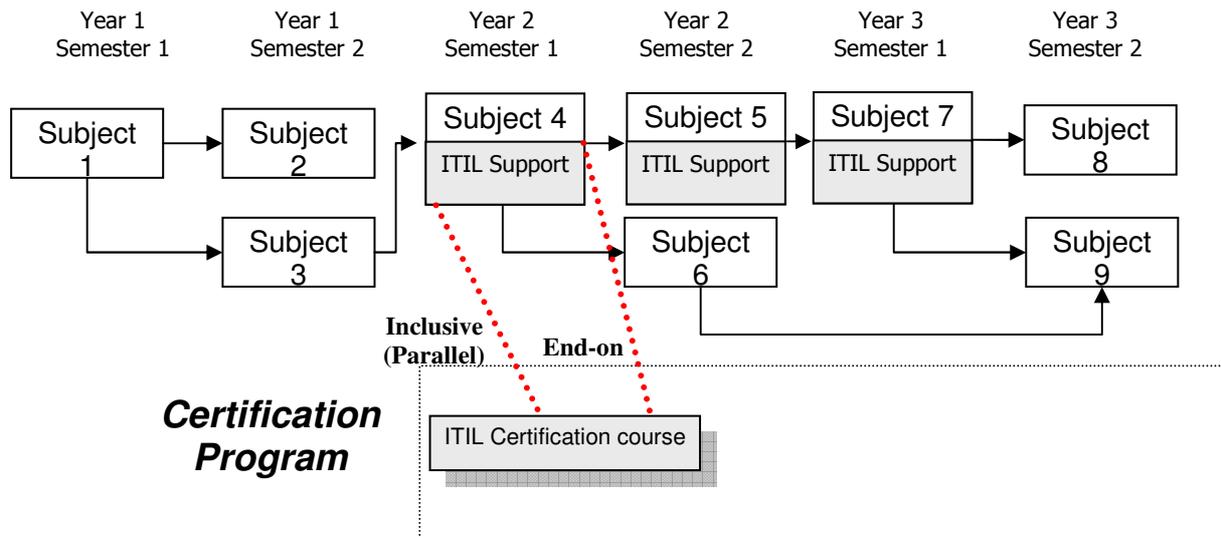


Figure 3: Certification Model Inclusive (Parallel)/End-on (adapted from Stein et. al (2005))

The certification model we have asked students to follow is in parallel with the subject. However, in practice it has been found most students are adopting an end-on model whereby they undertake the ITIL Foundation certificate course after completing the subject or degree. There are few reasons stated by students why they prefer the end-on model: not willing to commit time during semester; did not see the value until the subject was nearly finished or finished; realised the value of having an ITIL certification when they started looking at IT jobs. As can be seen by these sample student comments:

“I am still currently under the ITIL e-learning course, it's hard trying to do the course as it's very time consuming trying to remember the theory. I also have access to the text book in which I am reading currently. I plan to take the ITIL exam a few weeks or so before Christmas.” (Anon 1)

“The course itself is very informative and useful; I do recommend it to for IT professionals willing to expand their knowledge base. The ITIL course will be a very handy tool, as I have come across various job applications requiring this certification. Thank you for the opportunity in facilitating extra certifications at reduced pricing. More students should take advantage!!!” (Anon 5)

“I've completed it [ITIL by e-learning] and the exam. I found the course is good for giving basic groundwork on the covered topics and laying out processes and their relationships. It was easy to follow and understand, the exam was comprehensive as well and while some questions were challenging none were overly difficult. Thanks for setting up the ITIL option through the Art of Service it was a great opportunity.” (Anon 2)

## ISSUES

### Skills Acquisition for Teaching Staff

One major issue is how do staff members that have not had exposure to a framework such as ITIL gain knowledge and integrate it into their teaching. For the author this has required an immense number of hours, and including attaining the ITIL Foundations Certificate in 2001. Staff members and the author have gained certification through industry training courses for the ITIL Foundations Certificate, knowledge through reading and attending industry seminars and conferences. To gain an increase in knowledge and understanding of ITIL staff members have engaged in: reading white papers and industry publications; undertaking professional courses; attending industry seminars and training; attending service management conferences; supervising research students and student papers. Further increase in knowledge could be gained from Outside Study Programs, placements in industry for academics and gaining grants for research in service management.

### Incentives for students

To increase the participation by students in undertaking ITIL subjects and the ITIL certificate, prizes and certificates have been awarded to students. We have the following incentives for students:

- Computer Associates (CA)/VU certificate that is given by the School to all students who successfully complete Managing IT Service Support.

- Certificate of completion for The Art of Service e-learning course material
- Prize of \$250 for the best ITIL Foundations Certificate result is awarded to the student who obtains the highest result for the exam.

Students have been very positive about receiving the certificate for completing Managing IT Service Support and have indicated they are including it in their CVs. Illustrative of this is this student's comment, "... obtaining a certificate on completion of this subject, I can use it in my resume, job applications and interviews which I believe can give me a competitive advantage over many students without any experience and qualifications" (Anon 4).

However the main issue is that even though anywhere from 30-50% of students in class typically express an interest in undertaking the ITIL Foundations Certificate in practice just under 5% of students have undertaken the course by e-learning. This would indicate even though it is a positive experience with employment outcomes for students that have completed the certification the majority of students are not taking up the offer to add-value to their degree.

## FUTURE PLANS

Development of simulations, case studies and scenarios to stimulate what can otherwise be rather tedious service management concepts. In future semesters and in line with University Teaching and Learning strategy we wish to strengthen the move towards a more learner-centred approach rather than teacher-centred. Development or changes to existing subjects to incorporate and enhance infrastructure management and security management. We are also looking to pursue other types of involvement of industry partners in delivering certification. To strengthen the ITSM components within the specialisation of the degree and to extend industry liaison through student projects. Finally we need to explore the low participation rate by students in obtaining the ITIL Foundations Certificate.

## CONCLUSION

The paper has described the inclusion of ITIL concepts into degree subjects which has in turn led to positive outcomes for students in employability and relevance of subjects undertaken. There is work to be done to reflect on these early positive indicators in this paper and to understand the reasons for low participation in the ITIL certification option. This preliminary paper suggests that students prefer an end-on certification study path rather than in parallel with a subject.

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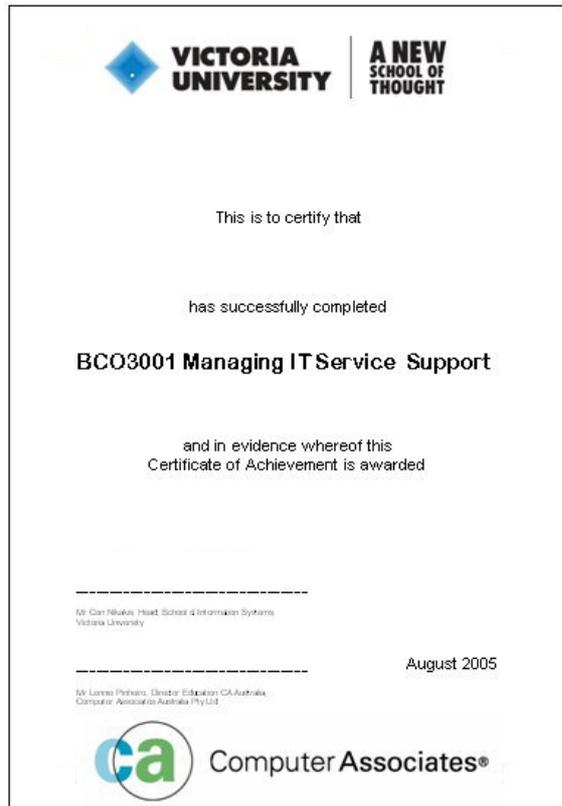
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## APPENDIX 1

Certificate given to students who successfully complete Managing IT Service Support.



Lecture Topic	Workshop
Introduction to IT Service Management	Introduction to CA <del>ServiceDesk</del> Plus v.6
IT Management Processes	CA <del>ServiceDesk</del> Concepts
ITIL Incident Management	CA <del>ServiceDesk</del> Incident Management
ITIL Problem Management (1)	CA <del>ServiceDesk</del> Incident Management
ITIL Problem Management (2)	CA <del>ServiceDesk</del> Problem Management
ITIL Configuration Management	CA <del>ServiceDesk</del> Configuration Management
ITIL Change Management	CA <del>ServiceDesk</del> Change Management
Managing IT Customer Relations	CA <del>ServiceDesk</del> Workflows
IT Service Management Issues	CA <del>ServiceDesk</del> Reports
IT Tools for managing support	CA <del>ServiceDesk</del> SLAs
IT performance measurement and reporting	CA <del>ServiceDesk</del> Metric Reports
IT Support as a profession	

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