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Introduction

This paper describes the methods used by the Centre of Medical Informatics (CMI) to deliver health informatics education to a wide range of medical and health care workers in the undergraduate, postgraduate, health professional and general practice environment. The Centre of Medical Informatics seeks to demonstrably benefit the delivery of health care by: providing the highest calibre health informatics education at undergraduate and postgraduate levels, extending knowledge of health technologies through innovative research and development, furthering understanding of health informatics in real contexts, through quality evaluation, process methodologies and contributing to the development of effectual policy at national and international levels, continuing to collaborate with multiple organisations from a wide range of disciplines in recognition of the multi-faceted nature of informatics research, and to promote effective use of informatics to health bodies, academia and the wider community.

Undergraduate Teaching

First year students are lectured in medical informatics in the first semes-

ter of medicine. As a result of surveys conducted in 1991 and 1995 the increase in the knowledge of keyboard expertise, concepts/terms and practical ability have made it unnecessary to teach basic application skills such as word-processing, spreadsheets etc. The aim of the Centre is to equip students with long lasting tools that can be applied throughout their six years of medical training. These include such skills as Email, the Internet (World Wide Web), literature search mechanisms (i.e. OVID), and an overview of the type of working environment that they will face when they graduate. Medical Informatics is a compulsory subject that is assessed by the completion of hurdle tasks that are delivered via the World Wide Web.

Fourth year students are offered the opportunity to interrupt their normal studies for a year to pursue an honors program in one aspect of a medical discipline to gain an extra qualification: the Bachelor of Medical Science. CMI had its first Bachelor of Medical Science in Medical Informatics student in 1995, and has continued to do so each year to date. Theses written include topics such as: "Emerging Trends in General Practice: Complementary Therapies, the Internet and the General Practitioner" (L.Carter, 1997) and "A new information system

for the Neonatal Intensive Care Unit at Monash Medical Centre" (H.Rodda, 2001).

Fourth year and final year students use an extensive range of computer assisted learning packages that have been developed by CMI and that are available at the many satellite sites of Monash University and teaching hospitals.

Bachelor of Biomedical Science, Faculty of Medicine first year students have lectures on subjects including: informatics and clinical health care, medical data, networks in health care, medical imaging, security and confidentiality and technology in practice. Health Informatics within the biomedical science degree is an examinable subject.

Bachelor of Radiography & Medical Imaging and the Bachelor of Nutrition & Dietetics are also degrees in which the Centre delivers basic health informatics principles to future health professionals.

General practice, health care workers and educationalists

The Centre has several educational computer programs available for

downloading from our Web site. These include the HIV Hypermedia Medical Education package that is designed to teach the fundamental concepts of HIV management and to provide reference material on all aspects of HIV disease. The program Technology in Medical Education (TechME) is a comprehensive web site for developers of educational technology in medical education. This site covers many aspects, including basic pedagogy, design methodology, interface design and links to relevant resources. What's the Hype? is a set of four interactive computer based packages for adolescent patient education, covering asthma, drugs and alcohol, body image and HIV/AIDS. Information regarding these resources are available at the site www.med.monash.edu.au/informatics/resources/

Postgraduate Teaching

PhD students have been participating in our program since 1995, students have covered a wide spectrum of health informatics topics such as: "The Affective Impact of Virtual Patients: Communication Skills, Narrative and the Student Experience" (M. Bearman, 2001). CMI is also involved in the Faculty of Medicine teaching program for PhD students.

Graduate Certificate of Health Informatics is a successful educational program that demonstrates the use of information technologies applied to Health Informatics. This is delivered as a flexible approach to learning via distance education. The course is a collaborative distance education program offered jointly between the Peninsula School of Network Computing: Faculty of Computing, the Centre of Medical Informatics and the School of Nursing: Faculty of Medicine. It is endorsed by the Australian Computing Society and the Health Informatics Society of Australia and

attracts Continuing Medical Education points from relevant professional bodies, including the Royal Australian College of General Practitioners and the Australian College of Surgeons.

The objective of the course is to give the students the expertise needed to be effective developers, users and managers of health information resources. Students learn to identify information needed by doctors, nurses, hospital administrators, government planners and other healthcare professionals and will understand how data is used to make effective healthcare decisions.

A CD-ROM provides the student with the course content, required readings, relevant Internet links, email and a forum for communication. Information is provided using various forms including PowerPoint, scanned abstracts and readings, graphics, audio and video files. This course is taught using flexible delivery mode via distance. The students while either in their home or working environment have the opportunity to work through the content in a fashion that they have more control over. This increases the scope for individual learning styles, for example reflective linear learning with appropriate hyperlinks for further information.

This course was offered for the first time in semester 1, 1999. To date, in August 2001 over sixty students have completed the course. Currently fifty five students are enrolled, with a mixture of national and international students.

The course, together with the student's expectations of the course was evaluated in the first semester and second semester of 1999 and again in 2001. The results show that the

program is successful in content, mode of delivery, student's preconceived expectations, together with the quality of teaching. Results are available at the site: www.med.monash.edu.au/informatics.

The Graduate Diploma in Health Informatics builds on the Graduate Certificate year. This year of teaching was introduced in 2001 and is also delivered in flexible learning distance education mode. On completion of the Graduate Diploma it is expected that the graduates be competent to play a number of roles in the health and allied health arenas in a technologically advanced and information rich society, have an understanding and experience of research in preparation to enhance a career in which Health Informatics research and development will be a key component, be able to use sophisticated information technology and information management techniques to improve the quality of care provided by the health service and to graduate with a detailed understanding of information technology and of the particular issues involved in the development of technology for use in healthcare.

The Graduate Diploma year uses a variety of teaching tools such as: the world wide web for week-to-week notes and guides, assessment, internet links, readings and a component of core teaching, textbooks, Web CT is used for threaded discussion and chat groups and a handbook of essential dates and university forms. As with the Graduate Certificate in Health Informatics, the Graduate Diploma in Health Informatics' enrolments have substantially increased each year. It is now necessary to place quotas on enrolments to ensure quality of teaching.

Master in Health Informatics by research and coursework is the final

year of the Centre's postgraduate coursework and will be offered for the first time in 2003.

Short Courses: Contemporary Issues in Health Informatics: The Centre offers a range of short and long courses delivered entirely on CD-ROM, catering for the health professional with a specific interest in the areas of: Internet technologies, Evaluation in Health Informatics, Contemporary Issues in Clinical Care, Electronic Health Record and Project Management. Each short course has recognised credit points towards either the Graduate Certificate/Diploma in Health Informatics. The student is assessed by assignment that is returned to the supervisor via email and receives certification upon completion.

Conclusion

Over the past six years CMI has significantly increased its range of delivery of health informatics postgraduate and undergraduate education. As each new year approaches all programs are reviewed and evaluated to ensure that the content is current and in keeping with the ever changing dynamics of information technology in our field. The model of offering a postgraduate course with exit levels of a Graduate Certificate, Graduate Diploma and Masters degree has proven to be highly sought after by students, allowing the flexibility of exit points and therefore allowing for the consideration of personal and work demands and the necessary commitment needed to study. At each exit point the student is able to reenrol in the next

level within seven years without penalty. As with all successful programs the Centre would not be able to maintain the high level of quality of teaching without the passionate dedication of our valued staff. Further information regarding the teaching programs described above is available at the site www.med.monash.edu.au/informatics.

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