

6<sup>th</sup> July 2010

Tena koutou katoa.

Welcome to the 23<sup>rd</sup> and final Annual Conference of the National Advisory Committee on Computing Qualifications (NACCQ). This is an historic moment in NACCQ history as we herald the beginning of a new organisation – CITRENZ, which will take computing education into the future.

This year's conference is hosted by Otago Polytechnic with all events, including workshops, panels, paper sessions and evening events held at the Forth Street campus. Otago Polytechnic's strategic theme of 'Inspiring Capability' fits well with the conference approach as we celebrate and support our combined capability in inspiring computing students across the country.

We are delighted to welcome delegates to Dunedin, the Edinburgh of the South. Dunedin has a rich history, from early Maori settlement in the sheltered harbour through to the arrival of the hardy Scottish settlers, eventually to become the education capital of New Zealand. Dunedin was New Zealand's first city and retains evidence of its gold rush days with beautiful and dramatic Victorian architecture.

We hope you will take the time to enjoy the many delights of our fine city. In your conference bags you will find a multitude of Dunedin treasures including chocolates from Cadburys, shortbread from the Scottish Shop, maps, discount coupons and vouchers from many local businesses. Please support these companies – you will find them on our conference map at <http://tinyurl.com/citrenz-map>

Two keynote speakers are featured at this 2010 conference. Nathan Shedroff, who comes to us from the groundbreaking MBA programme in Design Strategy at California College of the Arts, is one of the pioneers in experience design. In addition we welcome a familiar colleague, Anthony Robins from the University of Otago. Anthony will enlighten us on the perennial problems of teaching first year programming. We are sure you will enjoy their presentations. Over 30 papers have been double blind refereed and accepted for the conference. In addition you will enjoy six panels, industry speakers and more than 30 posters from delegates and students. Following the conference, the proceedings will be lodged in the ACM and SIGCSE digital libraries.

The conference has been made possible by the generous support of a number of sponsors, including AKO Aotearoa, Otago Polytechnic, Jade and Cisco. The organisation of our conference has also involved a huge effort from the local committee and from NACCQ executive members all over New Zealand. In particular we would like to thank Vivienne Wetere, our NACCQ Secretariat and William Hannan, our webmaster at EIT.

We are delighted to welcome over 80 delegates brave enough to attend a mid-winter Dunedin conference. We invite you to embrace the winter chill and to enjoy a good dose of southern hospitality. For your comfort, you will find a warm fleecy beanie in your conference packs. We hope you will enjoy the opportunity to network with colleagues, the social activities, and the chance to learn and develop by participating in your NACCQ Conference.

Kind regards

Lesley Smith  
Conference Chair

## CITRENZ/NACCQ 2010 CONFERENCE

**Tuesday 6th July**

11.00	<b>Morning Workshops</b>  <b>Workshop 1: Curriculum and Quality (Blue Book)</b> Dave Scadden Venue: G107  <b>Workshop 2: Managing Projects and Work Placements</b> Malcolm Weick Venue: G104	<b>Teachers' Forum</b> Venue: Ozone  <b>Session One</b> NZACDITT presentation Panel discussion: Vilna Goff-Jones (NZACDITT) Tracy Bowker (DTG) Paul Matthews (NZ Computer Society)  Chair: Chris McCarthy (CPIT)
12.30		
12.30 1.00	<b>Lunch</b>	
1.00	<b>Morning workshops continue</b>	<b>Session Two</b> Trends and Developments in IT Industry NZCS Industry panel  Emma Broadbent (Cisco) Mike Collins (CIO, OP) Chair: Paul Matthews (NZCS)
2.30		<b>Session Three</b> Career Pathways  Lynne Newell Ian Simpson  Chair: Lesley Smith (Otago Polytechnic)
2.30 3.00	<b>Afternoon Tea</b>	
3.00	<b>Afternoon Workshops</b>  <b>Workshop 3: Experience Design</b> Samuel Mann Venue: D201 then Otago Museum  <b>Workshop 4: Introduction to Scratch</b> Mike Lopez Venue: D207	<b>Afternoon Tea</b>
6.00		<i>Free Time</i>
6.30 8.00	Cisco Cocktail Evening Ozone Lounge	

<b>CITRENZ/NACCQ 2010 CONFERENCE Wednesday 7th July</b>		
10.00	<b>Registration</b> From 9am	Venue: Ozone Lounge
11.00		<b>Morning Tea</b>
11.00	Venue: Manaaki – Ozone Lounge	<b>Poster Presentations</b>
11.00		Venue: G106
11.30		<b>Mihi Whakatau</b> Huata Holmes
11.30		<b>Conference Opening</b>
11.30		<b>Otago Polytechnic Welcome</b> Mike Waddell
12.30		Chair: Lesley Smith
12.30		<b>Keynote Address</b> Nathan Shedroff
1.30		Chair: Assoc Prof Samuel Mann
12.30		Venue: Ozone
1.30		<b>Lunch</b>

	Venue: G107	Venue: G204	Venue: G203
	<b>Paper Session 1</b>	<b>Panel 1</b>	<b>Paper Session 2</b>
1.30	<b>Relevance of CCNA for Industry Students at Wintec</b> Dileep Rajendran, Ed Corbett	<b>Future of NACCQ</b>	<b>Selecting the best students for IT programmes: what determines “best”?</b> Karen Phillips
2.00	<b>A Review of Computer Science Resources to Support NCEA</b> Sumant Murugesh, Tim Bell, Ann McGrath	Stephen Corich, Garry Roberton: Changing the shape of NACCQ	<b>IT Students Orientation Week: A challenge accepted</b> Clare Atkins, David Ayre, Mark Caukill, Ryan Clarke, Matthias Otto, Mary Proctor
2.30	<b>The digital divide: real or imaginary?</b> Shirley Gibbs, Theresa McLennan:	Discussion on Future of NACCQ	<b>Using Google Docs for the Early Identification of ‘At Risk’ Students</b> Aaron Steele
3.00	Chair: Dave Bremer	Chair: Stephen Corich	Chair: Hamish Smith
3.00 3.30	Venue: Ozone <b>Afternoon Tea and Poster presentations</b>		
3.30	Venue: G106	Venue: G204	
	<b>Panel 2</b> <b>Retention and success</b>	<b>Panel 3</b> <b>Cloud Computing/Virtualisation</b>	
	Garry Roberton, Wintec Bruce Ferguson, Wintec Frina Albertyn, EIT Chris McCarthy, CPIT	Mike Lopez, Manukau John Ascroft, JADE George Tongariro, Whitireia Ashley Martin, OP	
5.00	Chair: Catherine Snell-Siddle, UCOL	Chair: David Weir CPIT	
5.30 7.30	Venue: Ozone Lounge <b>MashUp: PechaKucha with a twist</b> preceded by drinks and nibbles Sponsored by Applied Design Research Centre		

<b>CITRENZ/NACCQ 2010 CONFERENCE Thursday 8th July 2010</b>							
7.30	HOS breakfast, Bay Room						
9.00	<table border="1"> <tr> <td style="text-align: center;">Venue: G106</td> <td style="text-align: center;">Venue: G203</td> </tr> <tr> <td style="text-align: center;"><b>Research Forum</b></td> <td style="text-align: center;"><b>Panel 4 Curriculum</b></td> </tr> <tr> <td>"Gaining Research Funding" Peter Coolbear "From Computing Conference paper to Journal Submission" Tony Clear "Where to Publish and What it all means" Alison Young Chair: Alison Young</td> <td style="text-align: center;"><i>Curriculum and Quality Working Group</i>  Chair: Dave Scadden</td> </tr> </table>	Venue: G106	Venue: G203	<b>Research Forum</b>	<b>Panel 4 Curriculum</b>	"Gaining Research Funding" Peter Coolbear "From Computing Conference paper to Journal Submission" Tony Clear "Where to Publish and What it all means" Alison Young Chair: Alison Young	<i>Curriculum and Quality Working Group</i>  Chair: Dave Scadden
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10.30	Venue: Ozone <b>Coffee Break</b>						
11.00	<b>Poster Presentations</b>						

	Venue: G107 <b>Paper Session 3</b>	Venue: G204 <b>Paper Session 4</b>	Venue: G203 <b>Paper Session 5</b>
11.00	<b>First Year Programming: Using Competition for Motivation</b> Aaron Steele	<b>StudySieve: a system that supports student-generated short-answer questions</b> Andrew Luxton-Reilly, Beryl Plimmer, Robert Sheehan	<b>ICT4D: working with communities for ICT enabled change</b> Alison Young, Tony Clear, Chris McCarthy, Logan Muller
11.20	<b>Managing 'At Risk' students</b> Christo Potgieter, Wilfred Greyling, Bruce Ferguson	<b>The feedback Loop: Using Ubiquitous Presenter in computing classes</b> David Kennedy	<b>Computing student views on sustainability: a snapshot</b> Dobrilla Lopez, Mike Lopez
11.40	<b>Student Retention: How to keep them?</b> Frina Albertyn	<b>Using Mobile Technologies to Enhance Student Engagement in Large Lectures</b> Trevor Nesbit, Angela Martin	<b>Wilber's Quadrant Theory in an Interdisciplinary Approach to Teaching Sustainability in IT</b> Karen Love, Jonathan Ford, Jane Sutcliffe
12.00	<b>First Year Programming: Engagement vs Success Measurements from UCOL</b> Aaron Steele Chair: Dale Parsons	<b>Developing Research and Presentation Skills in Post Graduate Students</b> Donald Joyce, Becky Blackshaw, Alison Young Chair: Patricia Haden	<b>Discussion – sustainability</b> Chair: Samuel Mann
12.30	Venue: Technique		
1.30	<b>Lunch</b>		
1.30	Venue: G106		
	<b>Keynote: Anthony Robins</b>		
2.30	<b>Jade Presentation: John Ascroft</b>		
3.00	Venue: Ozone		
3.30	<b>Afternoon Tea</b>		

	Venue: G106	Venue: G203
	<b>Panel 5</b>	<b>Paper Session 6</b>
3.30	<b>Computing and Design</b>	<b>Establishing an IT Business Incubator in Hawke's Bay</b> Stephen Corich, Andrew Friedlander
3.50	Nathan Shedroff Beryl Plimmer, University of Auckland Michael Verhaart, EIT	<b>The changing role of e-commerce in regional SMEs</b> David Skelton, Gerard Gillet-Jackson
4.10		<b>Teaching Web Based Accounting Information Systems: Benefits and Pitfalls</b> Trevor Martin, Angela Martin
4.30		<b>Industry view of ICT Roles and Skills Needs in Canterbury</b> Mehdi Asgarkhani, Alison Young
5.00	Chair: Samuel Mann, OP	Chair: Chris McCarthy
5.00	Venue: G106	
6.30	<b>NACCQ/CITRENZ Annual General Meeting</b>	
7.00	Venue: Technique	
Late	<b>Conference Dinner "Winter White"</b> <b>Speaker : Peter Brook</b>	

**NACCQ 2010 CONFERENCE AGENDA Friday 9<sup>th</sup> July**

	Venue: G106	Venue: G204
	<b>Panel 6</b> <b>First year programming</b>	<b>Paper Session 7</b>
9.00		<b>Using web 2.0 in teaching and learning: A wiki case study</b> Michael Verhaart
9.20	Tony Clear, AUT Rob Oliver, CPIT Dale Parsons, OP Aaron Steele, UCOL	<b>Methods for rubric inclusion into Moodle</b> John Jamieson
9.40		<b>Blended Learning Environments: Lecturers have their say</b> David Skelton
10.00	Chair: Anthony Robins, University of Otago	<b>Attitudes of educators to the introduction of mobile technology aimed at supporting learners</b> Kathryn MacCallum
10.30		Chair: Trevor Nesbit
10.30	Venue Ozone <b>Coffee Break</b>	
11.00	<b>Poster Presentations</b>	

	Venue: G106	Venue: G204
	<b>Panel 7</b> <b>IT future services</b>	<b>Paper Session 8</b>
11.00	Mark Marshall, IT Manager CPIT Mike Collins, IT Manager Otago Poly	<b>Implementing a UUID Primary Key in a Distributed Email Client Application</b> Tim Hunt
11.20	Mark Caukill, NMIT Mark Lyons, Aoraki	<b>Students as new Settlers: the policy implementation gap</b> Chris McCarthy, Young Sook (Rosa)Yoo
11.40		<b>Assessing with a unit testing framework: variations of approach</b> Mike Lance, Amitrajit Sarkar, Ranran Bian
12.00	Chair: Garry Robertson Wintec	<b>Learning from JamSessions</b> Samuel Mann, Shaun Squires, Henry McConnochie, Daniel McFadyen, Blair Stratton, James Anderson, Patricia Haden, Hamish Smith, Lesley Smith
12.30		Chair: Steve Corich
12.30 1.30	Venue: Technique <b>Lunch</b>  <b>(Optional tour of Living Campus)</b>	Venue: Ozone  <b>Microsoft presentation</b> <b>(12.45 – 1.30)</b>
1.30	Venue: G106	
	<b>Closing Address – Pete Hodgson</b>	
3pm	<b>Pecha Kucha Presentations</b> <b>&amp; Awards</b>	
	Chair: Lesley Smith	

## KEYNOTE

Wednesday 7<sup>th</sup> July 11.30am  
G106



**Nathan Shedroff**

*Chair: Assoc Prof Samuel Mann, OP*

Nathan Shedroff is the chair of the groundbreaking MBA in Design Strategy at California College of the Arts (CCA) in San Francisco, CA. This program prepares next-generation leaders with a vision of business as sustainable, meaningful, ethical, profitable, and truly innovative. The program unites the perspectives of systems thinking, integrative thinking, sustainability, and new tools for leadership into a holistic framework.

## KEYNOTE

Thursday 8<sup>th</sup> July 1.30pm  
G106



**Anthony Robins**

*Chair: Assoc Prof Samuel Mann, OP*

### **The elusive "programmer gene"**

Introductory programming papers typically have very high fail rates. Paradoxically though, they typically have very high rates of top grades as well. What causes this bimodal distribution? For decades the default explanation has been that there are simply two kinds of people in the world, those that can program and those that can't. An extensive review of over 40 years of literature, however, fails to find any evidence of reliable predictors of learning outcomes. There doesn't seem to be a "programmer gene". Instead I propose an explanation based on a new mechanism -- "learning edge momentum" - - suggesting that an interaction between the way that people learn and the tightly integrated concepts of a programming language creates an inherent structural bias which drives learners towards extreme outcomes. In short, it isn't our students that are different, it's the way that our unique subject material interacts with the way that people learn.

## **Paper Session 1**

**Wednesday 7<sup>th</sup> July, 1.30 – 3.00**

**G107**

*Chair: David Bremer*

### **Relevance of CCNA for Industry Students at Wintec**

Dileep Rajendran, Ed Corbett

Cisco network certifications are gaining popularity among ICT students due to an increasing demand for these qualifications by industry employers. The aim of this paper is to determine how useful CCNA knowledge, skills and the qualification itself are to the ICT industry. There was a specific focus on roles relating to telecommunications/ networking. Wintec students working in this industry and studying CCNA were interviewed to evaluate which aspects of the course related to their employment. Data was obtained about the relevance that interviewees felt the course had for them, for new employees and for their employers. Relevant comments by participants about the course structure, course content and possible benefits to their career are also included.

### **A Review of Computer Science Resources to Support NCEA**

Sumant Murugesh, Tim Bell, Ann McGrath

The Ministry of Education in New Zealand is in the process of making a major revision to the technology curriculum for NCEA. These changes include the addition of a body of knowledge with distinct knowledge and skills for five strands of Digital Technologies, one of which is "Programming and Computer Science". Because this contains material that will be new to schools, the changes present several implementation challenges, especially professional development for teachers in the subject area, the development of teaching materials, and also advice for students to choose the most appropriate career path. This paper will give a comprehensive review of the

quantity and quality of existing resources that are available for teachers to use as course content and for their own professional development, identify strengths and weaknesses in the resources, and gaps that need to be filled. The gaps represent opportunities for tertiary organisations and industry to support schools as they make the transition to the new structure.

### **The digital divide: real or imaginary?**

Shirley Gibbs, Theresa McLennan:

There has been much written about the existence of a gap between generations when it comes to technology use and knowhow. This gap has been called the "digital divide." Since the early 1990s the prevalence of home computer use and ownership has increased to become the norm. Along with this, children are being exposed to computers at all levels of the education system from pre-school to tertiary study. This exposure has, in part, led to the premise that this current generation are "good" at using computers. This paper examines the concept of the digital divide from the perspective of a class of students enrolling in an introductory computing class in a New Zealand University in 2009. The mean age of this class was 20 with the most represented age group being those who are younger than twenty. This study found little evidence of the traditional digital divide.

## **Paper Session 2**

**Wednesday 7<sup>th</sup> July, 1.30 – 3.00**

**G203**

*Chair: Hamish Smith*

### **Selecting the best students for IT programmes: what determines “best”?**

Karen Phillips

For students who enrolled in a Level 5 Diploma (cf 1<sup>st</sup> year degree) in Information and Communications Technology between 2004 and 2009 in New Zealand, data have been gathered for factors that might predict success. These include age, gender, ethnicity, part- or full-time status, previous tertiary programmes completed and length of time between enrolment and start date. Measures of success examined include graduate status, total number of courses passed, total number of merit grades gained, percentage of courses passed and number of semesters taken to reach graduation. The two most important determinants of success are age at start, with older students performing better and number of days between enrolment and start date, with the greater time gap leading to higher success outcomes. The interplay of age and gender suggested that for younger students (under 25), being female was a better predictor of success, whereas for older students this difference disappears. There were indications that Māori students performed less well than NZ European students, but only the number of Merits gained was significantly lower for Māori.

### **IT Students Orientation Week: A challenge accepted**

Clare Atkins, David Ayre, Mark Caukill, Ryan Clarke, Matthias Otto, Mary Proctor

“Orientation Week” is a well established tradition in New Zealand tertiary education institutions and done well it is increasingly being recognised as important in both retaining students and contributing to their future success. Reflecting on previous years’ orientations prompted the IT teaching staff to

rethink the traditional form it had taken and as a result “IT Challenge Week” was organised. This was a series of fun but challenging tasks, involving all students, intended to encourage team work, problem solving, socializing and orientation to the services offered by the Institute and the wider community. Although not initially planned as a research project, the anecdotal and observable success of the Challenge Week has led the staff to consider the whole concept in more depth, not least how more traditional teaching activities may be enhanced by taking a similar approach. This paper details the rationale for the activities, based on observation and feedback and describes improvements that will be made for future years.

### **Using Google Docs for the Early Identification of ‘At Risk’ Students**

Aaron Steele

This paper explores the use of Google Docs as a mechanism for the early identification of ‘at risk’ students during the assessment process. A cloud computing assessment model is introduced and applied to a case study assessment involving 23 second year students. Monitoring and analysis of the assessment process revealed major advantages to using a cloud computing assessment model, specifically in the areas of progress checking, redirection of off track students, plagiarism, and on time submissions.

## **Paper Session 3**

**Thursday 8<sup>th</sup> July, 11.00 – 12.30**

**G107**

*Chair: Dale Parsons*

### **First Year Programming: Using Competition for Motivation**

Aaron Steele

This paper explores the use of an optional programming competition as motivation for first year programming students through examination of a case study. The case study involved monitoring student interest and involvement in an optional programming competition that was introduced to students at the start of the semester. Students were surveyed at the beginning and at the end of the semester with the results being compared with the actual number of competition participants. The study found that although student interest was initially very high, actual participation was much lower with students commonly citing time constraints and a lack of inspiration as reasons for not submitting competition entries. Although final submissions were lower than expected, the overall experience was found to be positive, and also provided additional beneficial from a lecturer's perspective.

### **Managing 'At Risk' students**

Christo Potgieter, Wilfred Greyling, Bruce Ferguson

Both the Tertiary Education Commission and the Ministry of Education are now moving fast to lower ITP funding for courses with low pass rates. It is imperative that academics understand student progression towards individual outcomes and pass rates of courses. Pro-active management with powerful tools for improved student outcomes will be very advantageous in future. Following work by McCarthy (2005) and Scott (2005) on student retention, completion and progression, Potgieter, Ferguson and Robertson reported during 2009 on several experiences regarding

student outcomes. The authors have since developed and now demonstrate a sophisticated tool for general use by proactive programme managers, specifically a statistical model to predict success of the pass/fail categories for IT students. This paper provides opportunities for further study and reference for reflective practice by programme Managers at ITPs

### **Student Retention: How to keep them?**

Frina Albertyn

Student retention is one of the more intricate issues of modern tertiary education. The purpose of this paper is to explore the reasons why first year Bachelor in Computing System students, at especially the Eastern Institute of Technology, continue their studies or leave after their first semester of study without completing their studies. This paper seeks to understand these reasons and to explore possible ways of retaining students who might consider withdrawing. It seeks to share with other institutes of technology these experiences and to find ways of improving retention rates at this institution. Some experiences from other institutes using existing published literature are explored. Students that withdrew in the first semester of study were telephonically interviewed. Their responses are discussed in the paper. Students that were retained were also interviewed and their responses are also analysed. Several interesting reasons were identified with both groups and will be included in the discussion of the findings in the paper.

### **First Year Programming: Engagement vs Success Measurements from UCOL**

Aaron Steele

This research paper sought to confirm the notion that high student engagement results in high academic success rates in first year programming. It also aimed to discover if high face-to-face engagement is necessary for success within a blended delivery environment.

The study measured various aspects of student engagement over the course of a semester and compared this data with each student's final grade. The results suggested that high face-to-face engagement most commonly results in high academic success, however a linear relationship could not be reasonably established from the data. The research also revealed limitations in using individual student Moodle hit counts as a measure for online engagement

## **Paper Session 4**

**Thursday 8<sup>th</sup> July, 11.00 – 12.30**

**G204**

*Chair: Patricia Haden*

### **StudySieve: a system that supports student-generated short-answer questions**

Andrew Luxton-Reilly, Beryl Plimmer, Robert Sheehan

Asking students to reflect on course content and ask questions about that content has been shown to improve comprehension in numerous domains. More recently, tools have been developed to store multiple-choice questions created by students in an online repository where they can be shared, evaluated and discussed with their peers. Although benefits are reported from the use of such systems, multiple-choice questions are not suitable for all teaching contexts: many instructors prefer to use free-response questions to assess learning.

We report here on a tool specifically designed to expand the contexts in which student-generated questions can be used. StudySieve supports student-generated questions with free-response answers. We investigate the way that students use StudySieve in an introductory computing course. We categorise their questions according to the cognitive dimension of the Revised Bloom's Taxonomy, and compare them with the questions used by instructors in coursework. We find that most student-

generated questions belong to the lower cognitive levels, consistent with the type of questions they must answer in laboratories and tests.

### **The feedback Loop: Using Ubiquitous Presenter in computing classes**

David Kennedy

The use of a network of tablet PCs to teach a first year computing degree mathematics class has shown that students value the learning involved in seeing other student's submissions and the teacher comments on these as well as comments on their own submissions. The lecturers value receiving responses from many of the students and not just the few who always answer. This paper discusses the use of an active learning pedagogy, student submissions, and feedback in a database class based in a standard PC computer laboratory. Instructor perceptions and student reactions to this pedagogy are discussed. Student reactions were collated from a questionnaire. In spite of many technical problems both lecturers and students reported benefits for teaching and learning.

### **Using Mobile Technologies to Enhance Student Engagement in Large Lectures**

Trevor Nesbit, Angela Martin

The pressure of increasing class sizes to gain financial economies of scale is seen by some as reducing the quality of the educational outcomes for students, with some of this reduction in quality focussing on the increasing lack of engagement and feedback between students and teachers/lecturers as class sizes increase. One aspect of engagement that diminishes as class sizes increase is the use of small group discussion around a topic, with one member of each group explaining their findings to the rest of the class with this then allowing the teacher/lecturer to give immediate feedback to the rest of the class.

Much of the literature surrounding the introduction of technology into the learning process has focussed on engaging students outside of the traditional face-face learning environment whether in a full or pure eLearning sense or as a supplement to face-face delivery. There has been some attention in the literature paid to the use of technologies such as “clickers” and other examples where technologies such as mobile phones and other wirelessly connected devices have been used with the explicit aim of enhancing student engagement.

This paper seeks to explore some of the pedagogical value that can be gained by the use of small group discussions with feedback, and how in larger classes of 200 or more students, some of this value can potentially be retained through the use of mobile technologies such as short-message-services (SMS) so that the students can give their group’s response and the whole class can receive feedback from the lecturer within 2-3 minutes. This means that this approach is much more aligned to the literature surrounding the use of classroom response systems and clickers than it is to the literature surrounding mLearning.

A literature review is conducted that covers some of the background behind the paper including the benefits of small group discussion with feedback; and some examples of how SMS, “clickers” and similar technologies have been used within a classroom setting. This is followed by a description of a model for how a readily available product (SMS-Studio), with some extra development, can be used to enhance the engagement of students in large classes. The results of initial experiments into its use in a large first year information systems class of more than 300 students are also presented.

The paper concludes that the trial of the system has been successful when it comes to the cost of participation for students; the engagement of students; the filtering of responses from students; the ability to give quick feedback to the students on their responses; and the student reaction to the use of the system.

## **Developing Research and Presentation Skills in Post Graduate Students**

Donald Joyce, Becky Blackshaw, Alison Young

In this paper, techniques used with postgraduate computing students to develop research, analysis and presentation skills are explained and their success is evaluated. Several different techniques are used with students entering post graduate study at different levels. The courses at each level and the research forums are described and analysed.

## **Paper Session 5**

**Thursday 8<sup>th</sup> July 11.00 – 12.30**

**G203**

*Chair: Samuel Mann*

### **ICT4D: working with communities for ICT enabled change**

Alison Young, Tony Clear, Chris McCarthy, Logan Muller

Technology implementations in remote areas of South America, and, for that matter, other parts of the developing world have had limited success or final benefit for the recipients. In one particular case in the remote Peruvian Andes, a New Zealand team engaged with the local population to form an approach for rolling out the Internet with the result being one of the highest uptakes of technology in Peru and a huge benefit for the recipient communities. The approach, or method, developed for the project has been called “Community Centric Empowerment” (CCE). This paper outlines the reasons for the development of the methodology, describes its elements and how it was applied in the implementation of technology in the developing world.

### **Computing student views on sustainability: a snapshot**

Dobrilla Lopez, Mike Lopez

UNESCO launched the Decade of Education for Sustainable Development for 2005 – 2014 with the aim of integrating Education for Sustainable Development (ESD) into all aspects of education and learning. The motivation for this study was to inform our decisions on embedding ESD into our teaching.

Incoming computing students (n=116) were surveyed to capture their views on sustainability before they engaged in formal learning and these views were compared to those of computing students at another institution. The study explored views on the relevance of sustainability to their study, sustainability priorities and knowledge, possible actions they could take, their capacity to take these actions and make a difference, and how they would deal with a challenging scenario.

Students were pro-ecological but did not believe they had the capability to make a difference. Significant variation was found in attitudes and values across the various ethnicities in our sample, suggesting that careful consideration should be given to this aspect.

This study adds to the emerging body of knowledge around sustainability perceptions and values of incoming students and informs curriculum for the embedding of ESD into education and learning.

### **Wilber's Quadrant Theory in an Interdisciplinary**

#### **Approach to Teaching Sustainability in IT**

Karen Love, Jonathan Ford, Jane Sutcliffe

This paper describes the use of Ken Wilber's Integral Theory as applied to first year BIT professional practice students' oral presentations. The paper introduces Wilber's theory and his use of quadrants as a theoretical framework for approaching technology and sustainability via popular media.

## **Paper Session 6**

Thursday 8<sup>th</sup> July 3.30 – 5.00

G203

*Chair: Chris McCarthy*

### **Establishing an IT Business Incubator in Hawke's Bay**

Stephen Corich, Andrew Friedlander

All but one of the business incubators in New Zealand are located in a metropolitan areas and all of them are closely associated with one of the New Zealand's major universities. This paper describes an attempt to establish a business incubator, with a focus on using IT, in a regional centre which does not have a University presence.

The paper describes how a group of Hawke's Bay business leaders working alongside Eastern Institute of Technology (EIT) set about trying to establish a business incubator in the Hawke's Bay region. The decision to consider developing a business incubator with an Information Technology (IT) focus arose from an offer by FX Networks, New Zealand to provide accommodation, and IT and networking support to local entrepreneurs who might need assistance in establishing a new business venture.

The paper briefly describes the processes adopted by a steering group consisting of educational and business leaders as they went about attempting to establish an incubator. The paper also describes how local businesses were surveyed in an attempt to establish the level of support that existed. The findings from the survey, which showed mixed level of business support, are also presented. The paper concludes with a summary of progress to date. The paper will be of interest to educational institutes and businesses in regional centers of New Zealand who are thinking of establishing a business incubator and are looking for advice on the processes to follow.

### **The changing role of e-commerce in regional SMEs**

David Skelton, Gerard Gillet-Jackson

This article examines the penetration of e-commerce within the strategic marketing mix of small to medium enterprises (SMEs) in Napier, New Zealand. A sample group of thirty businesses of various types was selected in Napier with a sixty percent response rate. It seeks to ascertain the level of e-commerce penetration into those businesses using the internet, those with websites of their own or industry supported, those involved with purchasing and selling online. Frequency of update, plans for future involvement and the percentage of e-commerce used for marketing was also examined.

A review of strategic marketing and e-business literature was conducted. This tied in with current NZ governmental proposals and actions to increase high speed broadband internet for business use to twenty-five major regions, including Napier.

It was established that the percentage of SMEs utilising e-marketing had increased since a previous study in 2003. However, despite the increase, the utilisation percentage appeared to remain low compared with other countries and NZ regions. Answers were sought as to why and what the future holds for e-commerce growth.

### **Teaching Web Based Accounting Information Systems: Benefits and Pitfalls**

Trevor Martin, Angela Martin

The purpose of this paper is to present the experiences of teaching part of a second year accounting information systems (AIS) course using a web-based AIS and another part of the same course using a traditionally installed stand alone system.

In an earlier paper, one of the authors developed a Small Business Web Based AIS Model that depicts the issues surrounding the selection and use of web-based AIS for small and medium enterprises (SMEs) in a New Zealand context. The experience of the lecturers

and the students is analysed and used to evaluate the model.

While there were some issues surrounding the use of the web-based AIS product, most of these could be dealt with, and they also served to reinforce a number of the theoretical aspects that are covered in the course. The findings of this paper were consistent with 5 of the 10 aspects of the Small Business Web Based AIS Model without contradicting the other 5 aspects of the model.

### **Industry view of ICT Roles and Skills Needs in Canterbury**

Mehdi Asgarkhani, Alison Young

This paper elaborates on the ICT skills needs within both Canterbury region and New Zealand. ICTs play a crucial role in today's knowledge-based economy.

Organizations heavily rely on ICT solutions to develop and grow business. There is an increasing need for ICT skills within organizations – so as to benefit from the use of ICT tools and solutions. A focus group of industry representatives participated in this study – to identify the need for roles and skills within the ICT sector. It appears that there are consistencies in both the need for roles and the use of development platforms for the Canterbury region and all regions of New Zealand. That is to say, ICT qualifications designed to address national needs should address majority of ICT needs within the Canterbury region.

## **Paper Session 7**

**Friday 9<sup>th</sup> July 9.00-10.30**

**G204**

*Chair: Trevor Nesbit*

### **Using web 2.0 in teaching and learning: A wiki case study**

Michael Verhaart

This paper informs and demonstrates to educators how web 2.0 technologies could be incorporated into their teaching and learning. It describes a case study that uses a wiki as the content container that allows for the inclusion of shared media, such as Flickr, SlideShare and YouTube, plus social media, such as Twitter. The use of a supporting blog that manages out of context content is also described.

### **Methods for rubric inclusion into Moodle**

John Jamieson

The purpose of this paper is twofold, first part discussed a method of embedding a rubric in Moodle using various methods – existing facilities, SCORM and a Moodle Module. The second part introduced a Moodle specific module suitable for including multi dimensional rubrics. The paper briefly revisited the pedagogy behind the rubric and how it was applied to the Moodle module.

### **Blended Learning Environments: Lecturers have their say**

David Skelton

To investigate the overall blended learning environment in a tertiary institute a revealing case study reflected student and staff perspectives on the effective blended learning environment which is increasingly influenced by e-learning and emerging technologies. This particular paper focuses on the teacher's perspective on e-learning, emerging technologies and the blended environment which most universities and tertiary institutes

have now embraced to varying degrees. Qualitative data on the use of online and blended learning experiences by tertiary staff were gathered by email surveys and supplementary interviews. The study synthesised results from multiple sources within a tertiary institute and made recommendations and gave insight into optimal blended learning environments within the tertiary sector. Overall, the study provided a perspective on the psychology and strategic view of the learning environment for the future tertiary institute.

### **Attitudes of educators to the introduction of mobile technology aimed at supporting learners**

Kathryn MacCallum

Mobile technology offers a wide range of possible opportunities in the educational context. The portability and low cost of mobile devices, compared to computers, have enabled interaction and learning to take place anywhere and anytime. Mobile learning is a relatively new area of interest and many early researchers report a range of advantages and possibilities of using mobile devices in schools and tertiary institutes. However, as with the inclusion of all new technology into a new context, it is important to consider the possible barriers and resistance that may result from the introduction of new technology. This paper discusses the results of a survey conducted at one of the largest polytechnic in New Zealand. The survey was aimed at collecting educators' attitudes to mobile learning, to determine what factors influence their potential adoption of mobile technology into the educational setting. The survey adopted the Technology Adoption Model (TAM) which was used to assess the perceived usefulness and usability of mobile technology used to support teaching and learning.

## **Paper Session 8**

**Thursday 8<sup>th</sup> July 11.00-12.30**

**G204**

*Chair: Steve Corich*

### **Implementing a UUID Primary Key in a Distributed Email Client Application**

Tim Hunt

This paper describes the incorporation of Universal Unique Identifiers (UUIDs) into the database design for a children's email application. Implementation of the new design is described including the mechanism for sharing data between installations using an IMAP based email server. Testing of the software has demonstrated that the design results in a functional distributed application although there remains scope for improving the synchronization algorithm. The Mifrenz application is available from <http://mifrenz.com> for download.

### **Students as new Settlers: the policy implementation gap**

Chris McCarthy, Young Sook (Rosa)Yoo

Given that New Zealand is experiencing a lack of skilled labour in Information Technology (IT), and that this lack is increasing in direct proportion to ongoing technological development, the government is looking to immigrants to meet this shortfall. The purpose of this paper is to explore the issues surrounding the New Zealand Government's stated preference for meeting this shortfall in skilled labour by having highly qualified international students as new settlers/new immigrants. What actually happens to these international IT students once they are here in New Zealand and how does the New Zealand IT job market match their needs with the needs of these potential new settlers?

### **Assessing with a unit testing framework: variations of approach**

Mike Lance, Amitrajit Sarkar, Ranran Bian

This work describes two different uses of a Unit Testing Framework for automated marking of programming assignments. Usually unit testing focuses on verifying the correctness of individual methods. Here we firstly show how to use unit tests to give novice programmers feedback as they learn how to code simple data-centric Creation, Retrieval, Updating and Deletion (CRUD) tasks. Following this there is an explanation of how advancing novice programmers can be guided to create robust methods in a complex system through the feedback from automated acceptance tests. These are novel variations of the standard use of unit tests for automatic assessment of programming assignments and showcase the possibilities for vocational focused programming courses.

### **Learning from JamSessions**

Samuel Mann, Shaun Squires, Henry McConnochie, Daniel McFadyen, Blair Stratton, James Anderson, Patricia Haden, Hamish Smith, Lesley Smith

This paper describes the development of JamSessions: an interactive game for the real guitar that combines real-time analysis and challenge-based game play to provide an engaging learning experience. JamSessions was developed as a capstone project within an information technology degree. This paper explores the factors that made the project successful, with a view to enhancing future projects. These success factors include a strong group with a shared vision, a test-driven development approach, collaboration with design students, high skill and problem solving.

## **Panel 1**

**Wednesday 7<sup>th</sup> July, 1.30 – 3.00**

**G204**

*Chair: Stephen Corich*

### **Future of NACCQ**

Stephen Corich, Garry Robertson: Changing the shape of NACCQ

Recent years have seen significant changes occur in the tertiary education sector. A change of government and a new Tertiary Education Strategy, together with a major restructuring of the body representing Institutes of Technology and Polytechnics (ITP), has forced NACCQ to reevaluate its role in the sector.

This paper examines how these changes have impacted on computing education within the tertiary education sector and, in particular, within the ITPs. The role of the National Advisory Committee on Computing Qualifications (NACCQ), based on 23 years of consecutive activity, is described.

The paper explains the plans to form a new organisation, Computing and Information Technology Education and Research New Zealand (CITRENZ).

CITRENZ will continue NACCQ's strong advocacy role in promoting computing and Information Technology (IT) in the tertiary education sector.

The paper will be of interest to educational institutes delivering computing and IT qualifications, to students enrolled in the qualifications and to all stakeholders who have an interest in the programmes.

## **Panel 2**

**Wednesday 7<sup>th</sup> July, 3.30 – 5.00**

**G106**

*Chair: Catherine Snell-Siddle, UCOL*

### **Retention and Success**

Garry Robertson, Wintec

Bruce Ferguson, Wintec

Frina Albertyn, EIT

Chris McCarthy, CPIT

Issues surrounding student engagement and successful completion will be explored and the discussion will include an examination of data collection, reporting and processes; ways to enhance the learning experience; tracing the whereabouts of non-returning students; and looking at ways to increase retention and raise success rates

## **Panel 3**

**Wednesday 7<sup>th</sup> July, 3.30 – 5.00**

**G204**

*Chair: David Weir, CPIT*

### **Cloud Computing/ Virtualisation**

Mike Lopez, Manukau

John Ascroft, JADE

George Tongariro, Whitireia

Ashley Martin, OP

Cloud Computing can be defined as a pool of virtualised computer resources. Using this virtualisation, Cloud Computing allows workloads to be deployed and scaled-out quickly through the rapid provisioning of virtual or physical machines. The platform also provides a mechanism to manage those resources. In a Cloud Computing platform software is migrating from the desktop into the "clouds" of the Internet, promising users anytime, anywhere access to their programs and data. Shifts we are seeing are being driven by increased application - application interoperability, the broad acceptance of underlying web service standards and the use of public APIs and application development frameworks as the cultural norm for Internet applications. The concept of Cloud Computing and how virtualisation enables it offers many innovative opportunities and the panel will provide their vision on where we may be headed.

## **Panel 4**

**Thursday 8<sup>th</sup> July, 9.00 – 10.30**

**G201**

*Chair: Dave Scadden*

**“Curriculum and Quality Working Group”**

## **Panel 5**

**Thursday 8<sup>th</sup> July, 3.30 – 5.00**

**G106**

*Chair: Samuel Mann, OP*

**“Computing and Design”**

Nathan Shedroff

Beryl Plimmer, University of Auckland

Michael Verhaart

Knuth described the “art of programming”, but the relationship between art and code is somewhat uneasy. For many years we have seen papers at conferences making excuses for computing students’ inabilities when it comes to design. We’ve all sat through assessments where students show us something functional but truly ugly. Yet many of them will find themselves as web-designers or games-designers or exhibition developers (I could write a long list here). For some this will mean working with colleagues “who can draw”, for others, especially those in small businesses, they’ll be it. This panel explores the relationship between design and computing. The central question is whether we are appropriately preparing our graduates for careers where computing is ubiquitous, but experiences are design-led.

## **Panel 6**

**Friday 9<sup>th</sup> July, 9.00 – 10.30**

**G106**

*Chair: Anthony Robins, University of Otago*

**“First year programming”**

Tony Clear, AUT

Rob Oliver, CPIT

Dale Parsons, OP

Aaron Steele, UCOL

Programming is the core IT skill, but it is difficult to teach and difficult to learn. That makes first year programming the make or break course both for individual students and also for departments in IT related fields. It's important that we as teachers get it right! But what does "right" mean? Panelists will speak to topics relating to first year programming, such as relevant theory or experimental results, recommendations on best practice, or tales from the front lines of first year teaching.

## **Panel 7**

**Friday 9<sup>th</sup> July, 11.00 – 12.30**

**G106**

*Chair: Garry Robertson, Wintec*

**“IT Future Services”**

Mark Marshall, IT Manager CPIT

Mike Collins, IT Manager Otago Poly

Mark Caukill, NMIT

Mark Lyons, Aoraki

Budgetary constraints may be impacting positively on the capabilities of Information Technology Services (ITS). Many organisations recognise that increasing their financial commitment to the technologies and services provided by ITS can lead to increases in efficiency and cost savings.

The constant challenge is to find new and more efficient ways of increasing capacity and capability. Understanding the technological

requirements for the delivery of teaching and learning, and engaging with management in the academic planning processes, helps underpin the resourceful provision of IT services. This includes providing a balance in the mix of in-house and outsourced services and consideration of the security risks inherent with both.

Teaching and learning requirements associated with the Schools of Computing & IT, where the campus production network and the School's network requires structural separation, potentially adds a further layer of complexity to the provision of IT services.

Panel members will discuss their responses to the challenges associated with the provision of services to their clients in the 21st century tertiary environment.

## **Research Forum**

**Thursday 8<sup>th</sup> July, 09.00 – 10.30**

**G106**

*Chair: Alison Young*

### **“Gaining Research Funding”**

Peter Coolbear

### **“From Computing Conference paper to Journal Submission”**

Tony Clear

It is accepted that academic conferences are one of the major forms of transmission of research findings within the computing disciplines. However in the various ranking systems for academic research, for disciplines other than computing, publication in academic archival journals is often more highly valued. A submission to a computing conference may sometimes be a self contained piece, but the conference format is of necessity brief and means that many aspects of the research must be glossed over. The lengthier journal article format can provide more scope for presenting your work in depth. Thus a conference

submission can also be viewed as but one step in a journey to a more considered piece of research and a higher quality publication. This paper discusses the issues that need to be taken into account and presents some guidelines for upgrading a conference paper to a journal submission.

### **“Where to Publish and What it All Means”**

Alison Young

## **Event**

### **MashUp: PechaKucha with a twist**

**Sponsored by the Applied Design Research Centre**

**Wednesday 7<sup>th</sup> July, 5.00 – 7.30  
Ozone Lounge**

At this year's CITRENZ/NACCQ conference we're introducing Pecha Kucha, with a twist: Pecha Kucha Mashup. A fast paced, visual, interactive and collaborative celebration of computing research

1. Fast paced visual presentation of work of innovators in our field.
2. Audience decides four themes.
3. Presenters and audience break into groups to tell new stories from mashup of presenters slides.
4. Present back

Eight presenters, each with 20 slides - 20 seconds for each slide (ie 6 mins each). With a quick turnover between presenters - 56 minutes total. Slides are visual (max three words a slide).

Then audience decides on four themes, in groups reuses the slides from all presenters to create 4 collaborative narratives. (1 hour). Presented back immediately and again to whole conference at final session.

This is in an early evening slot. Refreshments will be served.

## Posters

Wednesday 7<sup>th</sup> July  
Ozone Lounge

### **Leadership in ICT Organizations: Skills or Experience?**

Mehdi Asgarkhan, Jun Wan

### **ARGOS Data Storage and Analysis**

Mark Bennett , Josh Lowry, Patricia Haden,  
Hamish Smith and Samuel Mann

### **The Elusive Sweven of Successful, Swasivious Schooling of Subnetting**

Mark Caukill

### **Industry education integration: improving students' course subject application**

Paul Dechering

### **Turning Them Back from the Brink...**

Lesley Smith, Joy Gasson

### **Information Technology Plan and Google Adword Project**

Karn Heavey, Frina Albertyn and Adrienne Pierce

### **Assessing with a unit test framework: testware construction strategies**

Mike Lance, Ranran Bian, Amitrajit Sarkar

### **B2B large scale, large organization: Dell – a case study**

Chris McCarthy, Ranran (Monica) Bian

### **What drives a hacker – thrills, power or money?**

Chris McCarthy, Courtenay Beckwith

### **Hastings District Council – An IT Internship**

Sarah McElroy, Dr David Skelton

### **Rescue me: tangible collaboration**

Samuel Mann, Gareth Dorsett, Trevor Farquharson, Henry McConnochie, Caro McCaw, Daniel Alexander and Amos Mann

### **eHeritage Dunedin**

Adon Moskal , Scott Simister, Daniel Copeland,  
Hamish Smith and Samuel Mann

### **Community Projects: A Network Development Plan**

Rob Oliver

### **Numeracy tools**

Dale Parsons

### **Business Intelligence courses: Learn from America?**

Christo Potgieter, Vida Botes

### **The Perfect Storm of Literature Studies from International Students**

Christo Potgieter, Chris Burrell

### **Computing & IT Careers: Utilising a National Resource for Teaching and Learning**

Garry Robertson, Carol Aymes

### **IT & T Job Markets: National Trends & Global Commentary**

Garry Robertson

### **Internship programme**

Lesley Smith, Samuel Mann

### **Dare to be Digital: The Gender Influence**

Melanie Tansley

### **Using design research in the development of a final year HCI class project.**

Leonie Trower, Todd Cochrane

### **Farmwise: agricultural simulation**

Brantyn Yates, Ashley Evans, Patricia Haden,  
Hamish Smith and Samuel Mann

### **The Current Status: Who Teaches What?**

Alison Young

## Posters

Thursday 8<sup>th</sup> July

Ozone Lounge

### **The Language of Computing and IT: Read with Understanding**

Susan Bennett, Garry Robertson

### **An International Student's Learning Journey: from red to green**

Ranran Bian, Mike Lance

### **'Same-Origin Policy' Circumvention for Legitimate, Dynamic Web Development**

Glenn Crawford, Malcolm Wieck

### **CityScape: panoramic exhibition system**

Trevor Farquharson, Jun Cui, Gareth Dorset, Patricia Haden, Hamish Smith and Samuel Mann

### **Subvert Web Development Project**

Monica Grinstead, Richard Dargie

### **Multistage Quality Checks in Designing, Developing and Delivering Computing Degrees**

Donald Joyce, Alison Young

### **R&D Vouchers: Business Continuity of IT**

Bruce Ferguson, Jannat Maqbool, Christo Potgieter

### **The Virtual Drum Kit**

Ian Hunter

### **Trust and Confidence in eBay and TradeMe: a Comparison**

Chris McCarthy, Wanaporn (Fern) Udomrasami

### **Interactive Lightshow**

Michael Mackenzie, Jo Dickson, Emma Pennyquick, Hamish Smith and Samuel Mann

### **Managing a Network with Freeware: Who's the Man?**

Gareth Morton, Garry Robertson

### **When Failing Is Passing: Turning A Failed Project Into Success**

Rob Oliver

### **Assessing the Learner: Using Real Time Assessment**

Rob Oliver

### **NZCS and Communities of Practice (CoP) – Where to?**

Christo Potgieter, Garry Robertson

### **Access NACCQ conferences with NZCS Code of Practice?**

Christo Potgieter, Garry Robertson

### **Fletcher Easysteel – Health and Safety CD ROM Application**

Debbie Richardson, Michael Verhaart

### **Tertiary ICT Enrolments: Attracting Students – A recipe for success?**

Garry Robertson, Susan Bennett

### **Sustainable Software Engineering**

Lesley Smith, Samuel Mann

### **Heinz Wattie Internship: An EIT final project**

Riki-lee Toki, Frina Albertyn, Neil Jackett

### **HTML 5: Features and Limitations**

Joe Wynn, David Weir

### **Interactive Iterative Storyboarding**

Mia Yatiswarra, David Weir