

What Our ICT Graduates Really Need from Us: A Perspective from the Workplace

Tony Koppi¹ Judy Sheard² Fazel Naghdy¹ Joe Chicharo¹ Sylvia L. Edwards³
Wayne Brookes⁴ David Wilson⁴

¹Faculty of Informatics, University of Wollongong, Australia
tkoppi{fazel, chicharo}@uow.edu.au

²Faculty of Information Technology, Monash University, Australia
Judy.Sheard@infotech.monash.edu.au

³Faculty of Information Technology, Queensland University of Technology, Australia
s.edwards@qut.edu.au

⁴Faculty of Information Technology, University of Technology Sydney, Australia
brookes@it.uts.edu.au, David.Wilson@insearch.edu.au

Abstract

A national Discipline-Based Initiative (DBI) project for Information and Communications Technology (ICT), funded by the Australian Learning and Teaching Council, has sought the opinions of recent graduates of ICT in the workplace to help inform the curriculum. An online survey was devised to question graduates on workplace requirements and university preparation for abilities categorized as: personal/interpersonal; cognitive; business and technical. The graduates in employment have highlighted broad mismatches between the requirements of their professional work in these categories and the preparation for employment they received from university. A regression analysis was used to determine influences on graduates' opinions of the preparation they received at university. The quantitative and qualitative results from this survey could have far-reaching consequences for ICT education and this initiative will enable the development of curricula that ensures graduates are equipped with the skills required by the ICT industry.

Keywords: ICT curriculum, graduate workplace abilities, ICT graduates, professional work requirements, university courses

1 Introduction

This paper reports on a study that is part of the Discipline-Based Initiative (DBI) for Information and Communications Technology (ICT) education in Australia. This national project is based at the University of Wollongong under the directorship of Professors Joe Chicharo (Dean, Faculty of Informatics) and Fazel Naghdy (Head, School of Electrical

Computer and Telecommunications Engineering) and is concerned with improving education and the student experience in the broad range of ICT disciplines. The project is partnered by Monash University, Queensland University of Technology, and the University of Technology, Sydney, with the collaboration of the Australian Information Industry Association (AIIA) in parts of the project. It is supported by The Australian Learning and Teaching Council.

The issues and challenges facing the ICT education sector are broad and complex. The context in which these can be explored includes the interrelated areas of high schools, tertiary education providers (which are dominated by universities), industry, professional bodies and government. Furthermore, the discipline area of ICT covers a wide spectrum with engineering-related disciplines at one end and business/commerce-related disciplines at the other.

In spite of the downturn in the early years of this century, the ICT industry has proved to be quite robust and is set to grow in the coming years. There is a renewed optimism for healthy growth of the sector at least during this decade (Newstrom, 2005). The growth is expected to take place concurrently in all four major sectors of ICT i.e., hardware, software, services and communication.

The growth and expansion of ICT so far and its future development have two major impacts on ICT education. The growing ICT sector will require more trained human resources at all levels including maintenance, design, development, implementation and leadership. At the same time, new developments and inventions will create new fields in ICT, which in turn will demand introduction of new courses and training programs at all levels.

The rapid pace of change in the ICT sector has been driving and demanding parallel changes in all facets of ICT education including curriculum, structure, content and delivery. This has been crucial to ensure that courses offered have relevant curricula, address the needs of the ICT industry and produce graduates of immediate benefit in their employment.

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This paper is concerned with the ICT curriculum and its relevance to graduates in the workplace. Recent graduates who have been in the workplace from one to five years have been consulted about their curriculum by means of an online survey. A survey of graduates in the workplace was a recommendation from an Australian Universities Teaching Committee (AUTC) project concerned with ICT education (AUTC, 2001). The survey was designed to elicit from graduates in the workplace the abilities they consider as important for successful performance in their current professional work, and to give their perceptions of how well their university course prepared them for these abilities. The results of the survey will enable universities to develop curricula that better prepare their students for employment in the ICT sector. A similar but smaller and narrower study was carried out by Sumner and Yager (2008) in the US on perceived differences between what MIS graduates learned in their degree program and the requirements of their jobs.

The views of these graduates in the workplace represent industry's requirements of university curricula. Any discrepancy between these requirements and the perceptions of university preparation to meet them would reveal a gap between academia and industry. Such a gap between industry and academia was identified by Yen, Chen, Leea and Kohc (2003) and Nagarajan and Edwards (2008). Another perspective of graduate suitability for the workplace is given by employers (such as reported by Hagan, 2004) but that aspect is outside the scope of this paper.

2 Design of the online survey of graduates in the workplace

The online survey of ICT graduates in the workplace was intended to inform universities about the curriculum with respect to industry requirements. The survey questionnaire was developed by the project team. The design was based on that of Scott (2003) and modified for the purposes of this ICT study. The questionnaire was trialled with graduates and academics before release. Notification of the survey was via local Alumni Offices and responses were received from graduates from 15 Australian universities.

The categories under which the survey questions were devised are as follows:

- Personal/interpersonal abilities
- Thinking/cognitive abilities
- Business abilities
- Technical abilities
- Learning and university experience

The essential structure of the survey was three columns on a webpage with statements of abilities relevant to a particular category down the centre, the rating scale of importance of that ability in current professional work on the left, and the extent to which

the university course¹ focused on developing that ability on the right (as shown in Table 1). Five point Likert scales were used for the comparison of responses on the left and right of the table. Comparing the left and right sides illustrates how well the curriculum is integrated with the requirements of professional practice. The results tables presented below differ from the online version, which included radio buttons and the high-low order was reversed.

Text entry boxes were provided at the end of each category for respondents to add any comments and other information they considered would be helpful regarding that category.

3 Results and discussion

This paper reports on results from five universities that gave the majority of the total responses. These five universities were from NSW, Victoria and Queensland, and included one Group of Eight (Go8)² university and two from the Australian Technology Network (ATN). There were 548 completed responses to the online survey from graduates in the workplace from these five universities. The results are presented in the following tables as percentage values and they are ranked by the high score of the left column. Data were analysed in SPSS and the distribution of responses relating to current professional work was compared to that of university preparation by using the Wilcoxon Test.

3.1 Personal/interpersonal abilities

There were 12 questions in this category. The percentage responses are shown in Table 1. The results are ordered on the left hand column (high responses) for the importance for professional work. For all questions, the graduates gave a higher rating for the importance of the ability for successful performance of professional work than the extent to which the university course focussed on this ability. These differences were significant according to Wilcoxon tests. There were 104 open text responses to this category.

¹ Course in this context means a program of study for a degree or diploma.

² The Group of Eight is a coalition of research intensive Australian universities (<http://www.go8.edu.au/>)

Importance of this for successful performance in my Current professional work						Extent to which my University Course focused on this ability				
5	4	3	2	1		5	4	3	2	1
high				low		high				low
61	29	10	1	0	Ability to remain calm under pressure or when things go wrong	11	24	30	21	13
55	33	10	2	1	Ability to contribute positively to team-based projects	29	37	24	7	3
51	33	13	3	1	Ability to communicate effectively in writing	23	36	27	11	3
51	31	13	4	1	Ability to speak to groups of people effectively	13	35	28	15	10
49	39	10	2	0	A willingness to face and learn from my errors and listen openly to feedback	19	31	31	12	6
48	28	17	4	3	Ability to work productively with people from a wide range of cultural backgrounds	25	30	27	11	7
46	34	15	4	2	Ability to communicate effectively and appropriately using electronic media	19	37	26	15	4
44	41	12	2	1	A willingness to consider different points of view before coming to a decision	17	36	27	14	5
34	31	25	7	3	Ability to communicate effectively in visual or graphical formats	14	33	31	17	6
32	27	21	10	10	Ability to consider the impact of my actions on the environment	9	16	31	22	23
30	34	20	10	6	Ability to consider the impact of my actions on people in the broader community	9	19	34	22	17
11	14	19	14	43	Ability to communicate in languages other than English	4	6	16	14	59

Table 1. Personal/interpersonal abilities responses given as % and ranked in order of importance (high score) in current professional work

The ability to remain calm under pressure or when things go wrong is clearly seen as the most important ability in the work environment by nearly two thirds of the respondents. None of the open text responses directly commented on this particular ability although there were several comments of a general nature regarding these 'soft skills'. Some of those comments noted that universities were generally not good at developing these skills (e.g., "University has not focused on interpersonal skills to the extent it should have focused"), and other graduates noted that these were developed in extra-curricular activities within the university, such as in university clubs and societies, and also in part-time jobs and work experience. Participation in extra-curricular activities to develop interpersonal skills has also been advocated by the Engineers for the development of their graduates (King, 2008).

The ability to contribute positively to team-based projects is a high priority in professional work, as indicated by more than half of the respondents. Nagarajan and Edwards (2008) also reported that

teamwork is an important requirement at work. A positive comment noting the importance of teamwork and university contribution from a respondent:

"Team based assignments where individuals were scored on their contribution to the work were very important to ensure one person didn't "carry" the group, but was also not penalised for others short-falls. In IT today, it is rare to be working solo on a piece of work. More and more employers are asking for self-starting team based players, as more companies adopt the Agile project methodology."

However, in explanation of the significant difference between importance for professional work and university preparation of this ability (Table 1), other comments note that universities were not fully effective in developing teamwork skills for a variety of reasons including differences in ability, experience, attitude and behaviour amongst the students within an

environment that is different from that of the workplace.

Written and oral communication skills were also given high importance by more than half of the respondents and were also significantly different from university preparation for these abilities (Table 1). Nagarajan and Edwards (2008) reported that the dominant skill requirement at work was communication (both verbal and written). Many respondents commented on their lack of development of presentation abilities whilst at university.

“Presentations were usually done in Tutorials - while the first thing I came across (and I told myself I wish we were trained on this ...) was speaking to over 300 people.”

“...and only made 2-3 presentations to peers which utilised an over-head projector.”

“I also learned the importance of being able to consult effectively through presentation and confident speaking. I am still working on

these skills and had I realised the importance in UNI I would have given more of an effort in presentations etc.”

“I think more presentation skill should have been taught in university. In the first few subjects there should have been more importance on presentation”

One university was praised and thanked by a respondent for the valuable relevant training received in communication units.

3.2 Thinking/cognitive abilities

Table 2 shows the thinking/cognitive abilities ranked in order of high importance in professional work. There were eight questions in this category. In each case, graduates gave a higher rating for the importance of the ability for successful performance of professional work than the extent to which the university course focussed on this ability. These differences were significant according to Wilcoxon tests.

Importance of this for successful performance in my current professional work						Extent to which my University Course focused on this ability				
5	4	3	2	1		5	4	3	2	1
high				low		high				low
61	29	8	1	1	Ability to diagnose what is really causing a problem and test this out in action	19	32	30	12	6
55	30	12	2	1	Ability to identify the core issue in any situation from a mass of detail	18	32	31	14	4
52	39	8	1	0	Ability to access and organise information effectively	28	36	27	7	2
49	39	10	2	0	Ability to bring a creative approach to problem solving	19	38	29	11	4
44	37	17	2	1	Ability to keep up to date with relevant developments	17	33	29	15	7
43	35	17	5	1	Ability to represent and interpret information in a variety of formats (e.g., graphical, text or multimedia)	24	35	29	10	2
42	42	13	2	1	Ability to synthesise information into appropriate formats	20	39	32	7	2
34	35	18	9	4	Ability to work equally well in paper-based and electronic-based formats	24	33	30	9	4

Table 2. Thinking/cognitive abilities responses given as % and ranked in order of importance (high score) in current professional work

Out of the 45 written responses, several respondents claimed that these cognitive/thinking abilities are probably the most important part of the university experience and of high relevance to professional work, for example:

“The things that I use most from my university education are the personal skills

and thinking skills. Very little of the content of my degree do I use in my present role.”

Almost two thirds of respondents thought that the ability to diagnose what is really causing a problem and test this out in action is of high importance, and more than half of the respondents thought that the ability to identify the core issue in any situation from a mass of detail was also of high importance. These

problem solving abilities were generally not considered to have been well developed at university. Some typical responses:

“Diagnosing problems is a highly developed skill, but was not "taught" at all. We each practiced it on our own solutions, but weren't given the skills.”

“It would be worthwhile in some of the problem-solving subjects, providing opportunities to students to complete the same task using different approaches would prove useful in training creative thinking.”

“I felt somewhat guided at university as to the solution to a problem especially if it was related to a specific topic. Generally I have

little or no information and very vague descriptions of the problem.”

“More real world examples of problems would be useful in ICT courses.”

3.3 Business abilities

Table 3 shows the business abilities ranked as being of high importance in professional work. There were eight questions in this category. In each case, graduates gave a higher rating for the importance of the ability for successful performance of professional work higher than the extent to which the university course focussed on this ability. These differences were significant according to Wilcoxon tests.

Importance of this for successful performance in my current professional work						Extent to which my University Course focused on this ability				
5	4	3	2	1		5	4	3	2	1
high				low		high				low
64	25	9	1	1	Ability to understand, appreciate and meet the needs of your clients	16	29	30	16	9
55	34	8	1	2	A willingness to take responsibility for projects including their outcomes	24	37	25	9	6
54	36	8	1	1	Ability to set and justify priorities	20	32	29	14	5
51	33	11	3	2	Knowing how to manage projects into successful implementation	21	35	27	12	5
50	35	11	3	1	Ability to estimate the time required for work-related tasks	20	33	25	15	8
44	35	15	4	3	Having an understanding of how your organisation functions as a business	11	22	31	19	17
39	33	18	5	4	Ability to be flexible and adaptable to frequent changes of employment	11	20	27	22	20
28	33	23	10	6	Ability to translate innovation into a viable business plan	11	22	30	20	17

Table 3. Business abilities responses given as % and ranked in order of importance (high score) in current professional work

Many of the 34 text responses in this category noted the importance of business skills in ICT employment. Some illustrative responses:

“I score 5 for all of the items because today's competitive is very tight. All are necessary”

“Business skills are essential to THRIVE (not just survive) in the IT industry. While Uni graduates continue to under-perform in this area, the degrees they showcase will continue to be under-valued and discounted as mere bits of paper.”

“Aside from 3rd and 4th year projects, I found business skills to be lacking from my degree.

When I started to manage projects for my company, I found these things difficult and had to learn very quickly from my mistakes.”

“Understanding the business context is essential however I really only did 1 subject that required this but in my programming work that I am doing I MUST speak the same language as the business and demonstrate that I understand their business from their perspective.”

However, while acknowledging the importance of business skills, other respondents commented on other important roles of universities.

“However, it's crucial to have a deep theoretical framework to build on, from the outset. And there's not so much luxury to get this in the chaos of working life. That's where time at Uni is such a crucial window of opportunity for learning theory and concepts.”

“I did not do a business or management related degree. I did a technical degree where I would not expect these things would need to be covered. I had gained previous business experience which I use for my current job.”

“...it would be more beneficial to have a subject give you a grounding in the principles

of the different methodologies, rather than trying to teach you to 'be' a PM on day 1.”

The challenge for university teachers seems to be one of achieving a balance of basic theory and business skills that will meet the needs of graduates in industry.

3.4 Technical abilities

Table 4 shows the technical abilities ranked as being of high importance in professional work in this category. The extent to which university courses focused on these abilities is significantly different in each case except for the item that is concerned with being able to program in relevant languages.

Importance of this for successful performance in my current professional work						Extent to which my University Course focused on this ability				
5	4	3	2	1		5	4	3	2	1
high				low		high				low
50	33	12	3	2	Having the technical expertise relevant to my work area	20	32	29	12	8
41	38	16	4	2	Having the practical skills to generate creative solutions to abstract problems	18	32	31	14	6
36	39	18	5	2	Having a critical understanding of theories and principles in a discipline area	26	39	26	8	2
34	32	21	7	5	Having experience with industry-based project work	12	21	27	22	18
28	33	27	8	4	Having numerical skills	19	32	28	13	8
26	28	24	13	9	Having exposure to ICT professionals prior to my current job	10	21	30	22	18
26	25	16	12	21	Being able to program in relevant languages	17	32	28	12	10
23	27	30	11	9	Being familiar with current technologies rather than fundamental theories	10	18	36	23	12
16	22	34	18	10	Having a firm grounding in fundamental theories rather than being familiar with current technologies	18	30	34	12	7

Table 4. Technical abilities responses given as % and ranked in order of importance (high score) in current professional work

Many of the text responses (49 in total) in this category commented that a focus on new technologies and practicalities relevant to the workplace is required. Some typical comments:

“A focus on new technologies available would be good even if it was a brief overview before leaving university to get a job.”

“Although the theory of a concept is important, believe that more time / focus should have been provided for the application of the particular theory.”

“Most of the course dealt with theory in depth - and failed to provide the practical skills relevant for work.”

Other respondents noted the relevance and place of fundamental theories.

“Nevertheless, I feel the theoretical background I got at Uni has put me in a very good position for adopting new technologies.”

“University is not TAFE, you should be learning more fundamental theories than current technologies.”

“Technical relevancy is well behind in University. Theory is usually good though and that is where I'm ahead of those that did not go to Uni.”

Several respondents noted the importance of specific industry skills and qualifications and commented that these should be available to university students.

“Programming is not a large part of my job however scripting is. Advanced scripting in PHP/Bash/Perl would have been useful to me.”

“In my 2 years of full-time employment I have been exposed constantly to the .NET platform which was never even considered during my university career.”

“During my course, I was introduced to ASP.NET, VB, C# and SQL. While this is good and relevant, it should be noted too that PHP is dominant in the real world.”

“It would be hugely useful to introduce students to BOTH ASP.NET and PHP as that would be a lot more relevant to the real world. I'm taking this survey only because I wanted to make this point - its from experience and I know others who share the same sentiments.”

“The Technical skills need to be accredited industry skills. Universities need to realise that learning the fundamentals at university is not up to the standard required by the work force.”

These diverse opinions of ICT graduates in the workplace emphasises the challenge that university teaching staff have in finding the optimal balance between fundamental theory, practical application, and industry requirements.

3.5 Learning experiences at university

Table 5 shows the learning experiences at university in relation to a set of abilities. The results are ranked as being of high importance in professional work. The extent to which university courses focused on these abilities is significantly different in each case except for the last item, which is concerned with being able to research publications to prepare documents, reports and presentations.

In this category, problem solving abilities rank the highest for professional work, and it appears that being able to solve problems personally is relatively more important than in a group. It is perhaps not surprising that universities match workplace requirements in the ability to research publications since that is a basic academic activity.

Importance of this for successful performance in my current professional work						Extent to which my University Course focused on this ability				
5	4	3	2	1		5	4	3	2	1
high				low		high				low
54	32	11	2	1	Problem-solving activities on my own	27	39	23	8	3
44	38	13	4	1	Problem-solving activities in a group	25	34	27	9	5
41	30	19	5	5	Working on projects relevant to industry	15	24	27	20	15
40	33	16	7	4	Giving presentations	26	33	25	10	7
36	30	19	7	8	Interviewing clients to ascertain their ICT needs for a project	10	20	25	22	23
33	30	22	10	6	Researching publications to prepare documents/ reports/ presentations	31	35	23	6	5

Table 5. Learning abilities responses given as % and ranked in order of importance (high score) in current professional work

3.6 The university experience

Table 6 shows the responses to a set of statements relating to the university experience. These indicate that the students were generally positive about their university experience. While some text responses stated that university teachers were not always up to date with technological advances, Table 6 shows that a majority of graduates in the workplace (59%) agreed to

some extent that the technical content of their degree was current. Some text responses also indicated that university courses did not prepare students well for their work, however almost two thirds of respondents (Table 6) tended to agree that they were well prepared for work. Furthermore, almost two thirds indicated that they consider their ICT qualification has an advantage over qualifications from other disciplines.

Several text responses noted that part-time work (of various kinds) contributed positively to preparation for the workplace. While 24% of graduates apparently did not have part-time work (Table 6), more than half of

the remainder indicated that part-time work contributed to their work preparation.

	5 Strongly agree	4 Somewhat agree	3 Neutral	2 Somewhat disagree	1 Strongly disagree	Not applicable
The technical content of my degree was always up to date	22	37	18	14	7	2
My part-time job helped me prepare for the workplace	25	17	17	7	10	24
My ICT qualification has an advantage over qualifications from other disciplines	30	32	19	10	7	4
My university courses prepared me well for my work	27	34	18	12	7	2

Table 6. Responses to aspects of the university experience given as %

The influence of the graduates' ratings of university course focus items (columns on the right in Tables 1-5) on their rating of how well their university course prepared them for their work (fourth item in Table 6 is taken as an indicator of 'satisfaction') was investigated using a stepwise regression analysis. Twenty four of the 43 university course items that produced coefficient values greater than 0.3 when correlated against the preparation for work item were used in the regression. Five of these items produced a model with an R^2 of 0.291, significant at $F(5,408) = 33.455$ for $p < 0.05$. The regression output is shown in Table 7.

The significant influence of the ability to contribute positively to team-based projects in the workplace with general satisfaction of university courses is supported by many text responses that note the importance of teamwork in professional practice. However, many text responses also criticise how teamwork is managed in universities.

It is noteworthy that two of these items relate to problem-solving activities. This is supported by many text responses, indicating the importance of problem-

solving capabilities in the workplace. It seems that university courses which utilise problem solving activities leads to better prepared professionals. This is also recognised for the engineering profession (King, 2008).

Graduates also seem generally satisfied with the technical abilities they developed at university even though they expressed considerable ambivalence towards current technologies and fundamental theories.

Since none of the business items produced a significant influence, it would seem that whatever business skills they learned or didn't learn at university, they do not contribute to their general satisfaction with their university courses. However, 'working on projects relevant to industry' is significant in this regard, and that would encompass many aspects including practical application, problem-solving, teamwork and business abilities. Because many of the graduates commented on the lack of business abilities they learned at university, this lack of correlation with a measure of satisfaction may simply be taken as support for their comments.

Extent to which my University Course focused on this ability	Standardised Beta	t	Significance (p value)
Ability to contribute positively to team-based projects	0.213	4.573	0.000
Ability to diagnose what is really causing a problem and test this out in action	0.126	2.485	0.013
Having the technical expertise relevant to my work area	0.175	3.568	0.000
Problem-solving activities on my own	0.135	2.729	0.007
Working on projects relevant to industry	0.118	2.339	0.020

Table 7. Regression analysis results relating general satisfaction with university courses (item 4 in Table 6) with university preparation for the workplace

4 Conclusion

Our study found that graduates consider a range of abilities from the personal/interpersonal, cognitive, business, technical and learning domains are important for performance of their work. These include communication, teamwork, problem solving, organisation of information, project management, client relationships and technical expertise. However, there were considerable mismatches between what graduates consider to be of high importance for their work and their perceptions of how well universities focused on developing relevant abilities. The free text comments provided explanation of many of these.

While a majority of graduates seem to be satisfied with how their university prepared them for their work, many perceive themselves as being under prepared in terms of personal and interpersonal skills and business abilities. Graduates claimed they were generally well prepared in technical skills but would prefer more exposure to new and emerging technologies.

The perception that graduates are underprepared in communication and other 'soft' skills is not necessarily because universities did not provide the opportunities for the development of these skills. As a number of graduates claimed, as students they did not appreciate the importance of these skills for future work and hence did not engage in developing these as fully as they might have.

Future work on these graduate perspectives and those from employers will be used to determine how industry and academia can work together to produce curricula that will prepare graduates for careers in an expanding ICT profession. An outcome of this approach may be more industry involvement in the teaching of undergraduates.

Information from graduates in the workplace indicated that a well-rounded ICT graduate requires relevant technical know-how, workplace experience, problem solving skills and ability to work in a team for success in professional employment. Sumner and Yager (2008) also concluded that students need a balance of technical and non-technical skills for industry relevance. Perhaps the most appropriate final words are from one of the respondents.

"I really think that universities need to expose their students to the latest technologies as that is the first step in preparing them for full-time employment. The next step is to expose them to a working environment to teach them that excellent grades will only get you so far and that you need to have people skills to help you excel in what you do."

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Editors:

Margaret Hamilton

School of Computer Science and Information Technology
RMIT University
GPO Box 2476V
Melbourne, Victoria, 3001, Australia
Email: margaret.hamilton@rmit.edu.au

Tony Clear

School of Computing and Mathematical Sciences
Auckland University of Technology
Private Bag 92006
Auckland 1020, New Zealand
Email: tony.clear@aut.ac.nz

Series Editors:

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Simeon Simoff, University of Western Sydney, NSW
crpit@infoeng.flinders.edu.au

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Preface

Welcome to the Eleventh Australasian Computing Education Conference (ACE2009). This year, the ACE2009 conference, which is part of the Australasian Computer Science Week, is being held in Wellington, New Zealand from January 19 to January 23, 2009.

We can truly call this an international conference with 77 authors coming from Malaysia, Taiwan, China, Finland, England, United States, Greece, Argentina, Sweden, New Zealand and Australia. The Chairs would like to thank the Program Committee for their excellent efforts in the double-blind reviewing process which resulted in the selection of 18 full papers from the 40 papers submitted, giving an acceptance rate of 45%.

Our keynote speaker is Professor Mark Guzdial from Georgia Tech, author of several books including "Introduction to Computing and Programming with Python: A Multimedia Approach." He is currently vice-chair of the ACM Education Board and is a prominent member of SIGCSE, being the Symposium Co-Chair for SIGCSE 2009. For two days prior to our conference, we have organized a workshop partly sponsored by SIGCSE on "Contextualised Approaches to Computing Education". The presenters, Mark Guzdial and his wife Barbara Ericson, will cover several different contextualized approaches, including media computation, robotics and engineering approaches to CS1.

The topics of ACE2009 papers and presentations include taxonomies, classifications, studies of novice programming students, the use of technology in education, course content, curriculum structure, methods of assessment, mobile, flexible, online learning, and evaluations of alternative approaches to computing education. The high quality papers this year continue to push the frontiers of opportunities for research and innovation in computing education, and this conference will enable these educators to meet and share their experiences in a new forum. We will be holding a Second Life Panel where we will attempt to stream SL to the Conference room and connect Melbourne, Auckland and Nelson to showcase SL in action.

In keeping with the ACE tradition, there will be a post-conference workshop continuing to build research in Australasian computing education. Five years ago in Dunedin, New Zealand, we held the first BRACE workshop, and this year, on the return to New Zealand we are continuing the tradition by holding a BRACElet workshop.

We are grateful to SIGCSE for the grant to fund the pre-conference workshop, and for sponsoring the Conference jointly with the ACM. We thank everyone involved in Australasian Computer Science Week for making this Conference and Proceedings publication possible, and we thank CORE, our hosts Victoria University Wellington, and the Australasian Computing Education Executive for the opportunity to chair this ACE2009 Conference.

Margaret Hamilton
RMIT University, Australia

Tony Clear
Auckland University of Technology, New Zealand

ACE 2009 Programme Chairs
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