Breakfast with ICT Employers: What do they want to see in our graduates?

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Abstract

In an increasingly globalised and competitive economy, there is a need to ensure that graduates have the skills, knowledge and attitudes to be not only work ready for today but *work ready PLUS* for tomorrow. Data from the Graduate Destination Survey (2012) show that 75% of ICT students get a job once they complete their degree. Although employment outcomes are influenced by external market conditions, students, employers and other stakeholders expect universities to help students maximise their potential to find suitable work, that is, maximise their employability.

Employability is achieved by developing students' technical and generic skills. The development of technical skills is difficult in the computing sector where it has been argued that the ICT fundamentals have changed so much and continue to change rapidly. This project aims to understand what employability skills ICT employers expect to see in our graduates. Data for this study was collected from ICT employers, invited to participate in an industry breakfast to discuss the employability skills they are looking for when employing graduates.

A qualitative thematic analysis has been used to analyse the data, and the findings suggest that employers want ICT graduates to have effective teamwork and communication skills, with flexible and adaptive attitudes, without being arrogant. This study is part of a larger nationally funded project by the Australian Government Department of Education, aimed at developing employability skills in disciplines with low employment outcomes.

Keywords: ICT Graduate Employability; SFIA skills framework; Computer Science Education.

1 Introduction

In an increasingly globalised and competitive economy, there is a demand to ensure that graduates have the skills, knowledge and attitudes not only to be work ready for today but *work ready PLUS* for tomorrow (Fullan and Scott, 2014). Graduates need to be able to successfully navigate the messy realities of the workplace. From the perspective of students, employers, governments and other stakeholders, it is the responsibility of universities to best equip students to maximise their potential, to enable them to find suitable work and excel in the workplace - that is, to maximise their employability. It is usually a combination of technical and generic skills that makes students employable. Yorke (2006) defines employability as a set of achievements, which include skills, understandings and personal attributes. It is these achievements that make graduates more likely to gain employment, and then be successful in their chosen career. Employment outcome, however, refers to a measure of the number of graduates that actually secure full-time jobs, which in addition to a student's employability, is often influenced by external market conditions.

In the discipline of ICT, there is perceived gap between what employers would like to see in ICT graduates and what skills the graduates actually have. Data from the Graduate Destination Survey (2012) shows that approximately 75% of ICT students find a job once they complete their degree. There are many challenges faced by students who enter the IT sector, and one of the main challenges as suggested by John Craven from DB Results (Craven, 2014) at a presentation to the Australian Council of Deans of ICT (on 8th May 2014) is that the ICT fundamentals have changed. Technically, the field has moved from a strong focus on application software to a range of business platforms, from pure requirements gathering to outcomes and continuous improvement of systems, and the industry continues to struggle with suitable methodologies for successful systems

development, with a strong move from the waterfall approach to agile methods (Wilton, 2011, Okay-Somerville & Scholarios, 2013, Curtis & McKenzie, 2001). Organisations are excited by the opportunities and challenges provided by big data and the continuous technological advances. It is recognised that the technical skills are dynamic, shaped by new technologies and market demands, but in addition to the changing technical landscape, generic skills are equally as important. Consequently, there is an expanding dialogue between universities, industry and governments around "graduate attributes" and "employability".

This paper reports on a component of a broader national study. The national study focuses on developing employability skills in our graduates across a variety of disciplines, with the specific aim of aligning the expectations of employers, professional bodies, academic staff, graduates and students. It seeks to identify good practice curricula that promote graduate employability. This large study is funded by the Australian Government Department of Education. The focus of this paper, however, is to understand more deeply contemporary employability skills and attributes ICT employers expect to see in our graduates. Section 2 outlines models for understanding employability. Section 3 outlines the data collection process from the ICT employers across Australia participating in the study. This sample reflects the diversity of ICT employers in Australia today, and the range of ICT disciplines. A detailed description of the employability skills that employers are looking for is provided in Section 4 of the paper, followed by a discussion of the findings in Section 5. The conclusion highlights the themes emerging from the data and future work from the study is foreshadowed.

2 Background

A review of the current literature generally differentiates between two general categories of employability skills: technical (job-specific, functional or discipline-specific skills) and generic (core or non-technical skills). (Bhaerman & Spill, 1988; Department of Industry, 2013; Lowden et al., 2011; Yorke, 2006).

While it is essential that individuals possess the technical skills necessary for their chosen profession in order to be considered employable in the industry, these skills seem to be "taken for granted" by employers (Yorke, 2006, p. 4). This is because it is generally assumed that graduates will have already acquired and developed these skills through their qualifications, hence possessing the technical skills simply becomes a "tick in the box" (Brown, Hesketh, & Williams, 2002, p. 19). This has resulted in the generic skills becoming a more important determinant of employability and the subject of much of the research literature.

2.1 Generic Skills

Generic skills or soft skills are understood to be the range of skills that encapsulate physical abilities, cognitive abilities and interpersonal skills that "enable people to succeed in a wide range of different tasks and jobs" (Yorke, 2006, p. 12). These skills are frequently cited as being an essential component of employability, highly valued by employers (Finch et al., 2013), and often encompass capabilities such as: written and oral communication, listening skills; professionalism, and teamwork and leadership. Alongside these skills, cognitive abilities such as problem solving, strategic and critical thinking and creativity are also considered to be essential components of employability (Lowden et al., 2011). In addition, Muhamad (2012) understands these skills as the ability to process complex information, question and reason and put new knowledge into practice. Furthermore, self-management, punctuality and time management, as well as the ability to adhere to workplace expectations are also important factors (UKCES, 2009). These generic skills are often termed "transferable skills" as they are applicable across a range of contexts and disciplines (Muhamad, 2012). In recent decades there has been an increasing demand for generic skills in the workplace.

2.2 Employability Skills

There is a significant body of work that focuses on employability being linked to skills gained, and there have been many attempts to define and categorise the skills that employers consider to be valuable in the workplace, across a broad range of professions. In an effort to holistically define and categorise the aforementioned generic skills, the Department of Industry (2013), in collaboration with several Australian government departments, developed the Core Skills for Work Developmental Framework. This framework groups these skills into three clusters:

- Navigating the world of work, including being able to manage career and work life and navigate rights and protocols at work;
- Interacting with others, encompassing communication, listening and interpersonal skills;
- Getting the work done, incorporating the ability to plan and organise, make decisions, identify and solve problems and create and innovate.

Another straightforward, practical model, the CareerEDGE model, developed by Pool & Sewell (2007) enables employability to be understood by students, parents and careers advisers and includes the following five key components of employability: career development and learning; work and life experience; degree subject knowledge; understanding and skills; generic skills and emotional intelligence.

More recently, Fullan and Scott (2014) define core learning outcomes as the six C's of deep learning, that will give graduates the *PLUS* factor which will allow them to manage the complex realities of the workplace. These core skills which involve academic and personal/interpersonal qualities and capabilities, include: *Character* such as grit, tenancies and perseverance; *global Citizenship* - considering global issues based on deep understanding of diverse values; *Collaboration* - working in teams with strong interpersonal skills; spoken,

written and digital *Communication skills*; *Creativity* - having an entrepreneurial eye for economic and social opportunities and *Critical thinking* - being able to evaluate knowledge and apply it in the real world.

In the ICT profession, the Skills Framework for the Information Age (SFIA), a framework for describing and managing the skills needed by IT professionals, was developed by people experienced in the management of skills in IT. SFIA has become a de facto standard around the world, with over 2,500 corporate users in 195 countries (http://www.sfia-online.org/).

SFIA maps out 96 professional IT skills, organised in the following six categories - strategy and architecture; business change; solution development and implementation; service management; procurement and management support; and client interface. It also defines seven levels of attainment - follow; assist; apply; enable; ensure and advise; initiate and influence; and set strategy, inspire and mobilise, each of which is described in generic, non-technical terms. Each skill has an overall definition, and an "at-level" definition for each of the levels at which it can be recognised. "IT professional capability comes from a combination of professional skills, behavioural skills and knowledge. Experience and qualifications validate and support that basic capability" SFIA (2014).

SFIA has been adopted by the Australian Computer Society (ACS), as well as other professional societies and organisations. It provides a foundation for the professional grades, accreditation and programs of the ACS, as well as a common framework which allows an international understanding of what an ICT role actually involves. One aspect of the ACS accreditation process aimed at encouraging the development of generic skills, is the mandatory requirement that every undergraduate and postgraduate program include a final year capstone project. This project should aim to draw together all the technical skills the graduate has learned throughout their degree, together with a strong focus on the development of generic skills.

2.3 The Gap

It has been suggested that the employability skills acquired at university may not match the skills needed in employment (Wilton, 2011, Riebe & Jackson, 2013). Many employers are not satisfied with the skills graduates bring to the workplace. Research undertaken for the Council for Industry and Higher Education by Archer and Davison, (2008); explains that almost a third of employers have problems with graduates' generic employability skills such as working in a team, communication, problem solving and self-management. A quarter of them are also disappointed with graduates' attitude to work, while close to half of the employer are looking for business awareness and foreign language skills. Their report highlights the findings from a pilot survey of 233 employers and shows that there is a need for action by universities, employers, students and government to address both the reality and perception of the skills deficit in our graduates (Archer & Davison, 2008). This is a reality felt by both students and employers, and should be the impetus for policy makers and the Higher Education sector to address this gap.

Finch et al (2013), recognise that there needs to be a stronger relationship between education and employability, driven by an understanding of the factors that influence an undergraduate student's "successful transition into the labour market" (p.682). Jollands et al (2012) also argue that employment outcomes can be enhanced by educational approaches which integrate generic skills related to employability into the curriculum. This study aims to develop a closer alignment between what employability skills ICT employers want, and what employability skills ICT academics need to develop in their students. The first step is to develop a contemporary understanding of the skills employers are looking for.

3 Method

3.1 Data Collection

Employers and staff of professional bodies were invited to participate in an Industry Breakfast Forum in June 2014. These were drawn from local employers from the project team member networks, program advisory committees from our respective Schools, and professional bodies for each discipline. Invitations were sent to staff in enterprises with a range of sizes, including small, medium and large companies.

ABCD University drew on employers from a wide range organisations that participate in their Industry Based Learning (IBL) program, which includes six month industry placements as part of students' undergraduate degree programs. A vital part of the program is regular engagement with the IBL industry partners. Structured engagement is facilitated through 4 steering committee meetings held to help manage the IBL program and discuss IT graduate employment issues. The initial call to partners to attend the event was made at an IBL steering committee meeting, where partners were informed of the national project. A similar process was followed for employers of XYZ ICT graduates.

The Forum commenced with a breakfast, in a large meeting room, where employers from five disciplines were introduced to each other and members of the research team for each discipline. There were researchers and employers from Engineering, Psychology, Media Communications, Applied Science as well as from the ICT industry. The project leader addressed the whole group giving details of the project to all the employers. The agenda was semi-structured. The five teams then separated into smaller industry-based focus group sessions. Each focus group moved to a nearby separate room and the session was recorded.

The ICT focus group was facilitated by two project team members. Participants filled in a short demographic questionnaire, and signed their consent form. They were then asked to introduce themselves and then asked to consider the following three questions regarding graduate employment. The three key questions discussed were:

1 What are the key skills you are looking for in prospective employees?
2 What are the key attitudes you would like graduates to display?

3 What would you not like to see in the prospective graduates?

Employers were first asked to jot down on Post-it notes the key skills employers looked for in graduates. They then discussed how they might assess these skills in graduates during selection interviews. Employers provided short written responses on Post-it notes, which were then sorted on butchers paper on the wall.

In a second round of discussion, each employer jotted on Post-it notes, their ideas about what attitudes they looked for in graduates. They then discussed how they might identify these attitudes in graduates, and which ones were often lacking.

Similarly the third question above was answered by employers jotting ideas on Post-it notes, which were once again sorted onto butchers paper on the wall.

3.2 Data Analysis

A total of 11 employers attended the industry breakfast. The industries represented in the focus group included primarily medium to large multinational and local organisations from the professional services, insurance, financial, technology and retail sectors.

The employers provided written responses on sticky notes to each question. These were clustered according to emerging themes and analysed quantitatively. A summary of the Post-it note analysis is provided in Tables 1 - 4 in the results section 4.1 of this paper. The discussions during the focus groups were recorded and were transcribed verbatim. The transcriptions were entered into NVivo and analysed thematically with a qualitative open coding approach based on themes drawn from the Dacre Pool and Sewell employability framework (2007).

4 Results and Discussion

4.1 Results Classification

Employers' comments were sorted and similar attitudes and skills were grouped. The top two skills and attitudes identified by employers on the Post-it notes (as shown in Table 1 below) were Communication skills followed by Teamwork. Nine of the eleven employers identified communication skills as the top "employability" skill. The top two attitudes were "motivated and driven" and "flexible and adaptable". Employers did not want to employ graduates who were unwilling to be flexible, which is understandable in an ever changing ICT environment.

Post-it Note Summary	Most Common	#	Second	#
Skill	Communication skills	9	Teamwork	5
Attitude	Motivated & driven	6	Flexible and adaptable	6

Table 1: The top two skills and attitudes ICT employers look for in prospective graduate employees

Classified lists of the skills and attitudes that employers want to see in graduates, and what employers do not want to see in graduates are presented in Tables 2 - 4. In each of these areas, Post-it notes were sorted by the research team based on similarity, and a classification scheme was created which is represented in the first column. The number of comments in each classification is specified in the second column, and the employers' comments (with duplicates removed) are provided in the third column.

Skill classification	No. of comments	List of comments on post-it notes
Communication skills	9	- Strong written skills - Presentation/oral skills - Communication (verbal and written)
Teamwork	5	- Team player - Interacting with others - Team work
Problem solving	4	- Structured problem solving ability - Critical thinking - Analysing and problem solving
Business acumen	4	- Must have business acumen - Commercial awareness - Link technology to business (impact)
Technical ability	4	- Demonstrate IT aptitude - Relevant technical abilities ie. R, C++ - Comp Sci / Programming skills
Leadership	3	- Demonstrate leadership skills - Influences others - Influencing skills
Work experience	3	- Any work experience, can be part-time, doesn't have to be relevant - Industry based learning is a clear advantage - Industry knowledge
Project management	2	- Time management - Prioritising
Relationships	2	- Client focused - Good networker
Company knowledge	1	- Research into company and specific role

Table 2: Skills ICT employers are looking for in graduates

Table 2 presents the top skills as identified by the employers from their Post-it notes, while Table 3 gives the key attitudes they are looking for in prospective graduates.

Attitude classification	No. of comments	List of unique comments on post-it notes
Flexibility	6	- Adaptability - Long term thinking - Reliance and adaptability - Demonstrate ability to adapt to difficult individuals/ circumstances
Motivation	6	- Personal drive - Self motivated - Passion and drive to succeed - "can do" attitude (not all about themselves and what they can get out for themselves)
Initiative	3	- Innovative thinking - Demonstrate taking initiative
Self awareness	3	- Confident (willing to contribute) - Personality - Self aware - Works well under pressure
Learning ability	3	- Willingness to learn - Willing to learn / develop
Work experience	2	- Any extra curricula / work - Experience outside of papers - It's not all about getting the top grades: looking for an individual with extra curricular activities

Table 3: Attitudes ICT employers are looking for in graduates

While discussing the skills and attitudes employers were seeking from graduate employees, they discussed some of the downsides of identifying these during interviews. They addressed the pros and cons of large and smaller sized group interviews. They were then asked to itemise the qualities they would not like do see graduates display in these interviews and these are presented in Table 4 below.

Attitude classification	No. of comments	List of unique comments on post-it notes
Inflexibility	5	- Unwilling to be flexible - Inflexible, unwilling to compromise
Unprofessionalism	2	- Lack of professionalism (business sense); includes tardiness, dress attire, inappropriate conversation - Poor workplace behaviour - not in line with values
Poor Communication	2	- Poor communication - eye contact, ask questions - Inability to listen/absorb
Under-preparation	2	- Lack of preparation - not doing their research prior to coming through process - Lack of career direction or organisational knowledge
Arrogance	2	- Arrogance, too cocky - Arrogance (expectation that everything will be handed on a plate)
Lack of Initiative	2	- Don't wait for instructions - be inquisitive - Lack of self awareness
Lack of Confidence	2	- Apprehensive, fear to speak up
Lack of Trust	1	- Ability to trust the individual - do they have their own agenda?

Table 4: What ICT employers do not want to see in prospective ICT graduates

4.2 Round Table Focus Group Discussion Analysis

The themes that employers deem important which emerged from analysis of the focus group discussion are teamwork, communication skills in particular listening, business acumen, flexibility and adaptability, confidence (not arrogance). We discuss these in more detail below.

4.2.1 Communication Skills

A key skill all employers agreed was essential for a future employee was ‘communication skills’, and in particular

they singled out 'listening' when asked to identify the most important one. They would like employees to listen to what is being asked of them by the employer, and not to tell them what needs to be done. They want someone who will not say the wrong thing at meetings and client interviews, but listen actively and contribute appropriately. Some illustrative quotes from employers include:

- *We look for the written communication skills [P1,p1]*
- *I think being a part of the good communicators [P8,p8]*
- *and often people fail an interview stage because they don't listen to the question and answer it completely different question to what you've asked… [P9,p8]*
- *Showing that empathy having that ability to sit down, listen, and talk, is something you want to see valued more often than not. Call it exuberance or enthusiasm or you know call it I'm excited to start a new role and I've got a tell you what it's [P1,p9]*

4.2.2 Teamwork

Another key skill which most employers identified as important was teamwork. As a first step, many employers interview their prospective employees in large groups of between 12 to 20. They are looking for people who can still "hold their own" with so many other people trying to contribute. However, they also look for someone who will not take over the group, and arrogantly promote themselves, their work or what they can do, the whole time. They want good listeners.

In the smaller group interviews of approximately 3 to 8 people, they are looking for someone who can explain their contribution to a group project, such as the capstone project which all IT graduates must complete before the end of their degree. Here they are looking for someone who has reflected on their own contribution, recognising they have not done the whole project, and are able to articulate why their contribution as part of a team was crucial to the success of the project.

Hence they are not looking for arrogance, where someone might say they were the manager and the success was entirely because of them, but nor do they want someone who will sit through such an interview and not promote themselves at all. In a group interview, they are not wanting someone to say they have a plan to be a manager in 5 years. Some quotes from the round table discussion which support the valued notion of teamwork include:

Some quotes which support this are:

- *At Company A and other organisations … it's the ability to work with others and have some thinking ability. You can see … maybe strategic thinking… longer term thinking, but also being able to work with others in the team [P3,p1]*
- *At Company B, we're very much a consulting services business now, we still have our technical software engineers and that type of thing when we look for these technical skills but the majority of our business is consulting and services so it's about finding people that have the ability to work well with our clients [P4,p1]*

4.2.3 Flexibility and Willingness to Learn

Attributes that employers liked to see are flexibility and a willingness to take up whatever role needs to be undertaken at that time in the business. They want employees who are comfortable being thrown in the deep end, where they have to quickly adapt to new environments and learn new things. Some companies have six month rotations through various parts of their organisation, so that staff are given the opportunity to identify areas of interest, and employers are able to observe where the employee would make the best contribution. They are looking for someone who is enthusiastic and willing to contribute. Some employer comments which illustrate this are:

- *I think it all comes back to that willingness to learn… More often and what we look for is someone who has that willingness to move from one side to another. [P1,p4]*
- *We need them to be adaptable. We need them to be willing to learn …but being adaptable is something that is really important to us [P4,p5]*
- *They might not have that similar role in a years' time and so they need to be adaptable. They need to be able to go hey this is a positive thing, not oh I thought I was going into SAP and not going to SAP anymore. [P9,p6]*
- *So you need to have the attitude that they want to be able to know that that's part of their development. [P3,p5]*

4.2.4 Business Acumen

Employers expect graduates to have a sense of business awareness so they can hit the ground running and enhance the worth of the company.

- *It might be their very first time working in a corporate environment but to have some sort of business awareness and sort of business savvy before they hit the workforce in terms of different stakeholders and knowing where people fit in the company. [P9,p6-7]*
- *At Company D as well…. more often than not they work with the business, they need to get that business prac and they need to understand staff we're working with cause we're working [as though] with gold so their merchandising is important. [P1,p10]*

4.2.5 Confidence but not Arrogance

The main thing which employers do not want to see is arrogance, which potential employees sometimes demonstrated during the interview process, by dominating the discussion. They do not want students telling them what their business needs are, and all the things they would change when they joined the organisation. Nor do they want to hear about all the wonderful things they can do technically. They believe that most students have the technical skills required by their company by the time they come to the interview, as they have passed their degree, or they have passed an entry level test, or both.

- W*e have grads who come in with a little bit of an attitude of expectation of what they want and you know we want to be a manager within a year or two. [P4,p5]*
- *We didn't like anyone who was too arrogant but who didn't contribute so it was one of those fine lines, you wanted someone who can contribute but if they started taking over, then that was thinking oh maybe we're not interested. [P2,p1]*
- *Mine's more so about unrealistic expectations, unwilling into compromise. [P4,p7]*

Overall ICT employers are looking for someone who demonstrates that they have the teamwork skills to fit in with their existing employees, belong to the groups by listening, identifying what they can contribute and generally overall enhance and improve their company.

5 Conclusion and Future Work

Students, employers and other stakeholders expect universities to help students maximise their potential to find suitable work, that is, to maximise their employability. In order to do this, it is necessary to work in partnership with industry and professional bodies and to understand the changing market conditions for graduates in their discipline. Students can best improve their generic skills when they and their teachers fully understand ICT employers' needs and expectations.

SFIA has provided a good framework for defining the employability skills students need, but it has yet to be fully integrated into academic programs. Capstone projects, a requirement for credentialing by the ACS, combine the technical skills required by future employers and generic skills. However, employers believe the generic skills need further, more guided and directed development, with a stronger emphasis on the listening skills, but without neglecting the oral and written skills.

This study provides a first step into understanding what contemporary employers are looking for in the ICT graduates. Our findings support previous studies (Archer & Davison, 2008, Wilton, 2011, Department of Industry, 2013) that ICT employers are not focused on the technical aspects when selecting employees. They believe that all graduates do have the foundation technical skills, but these technical skills are only deemed important during the selection process for highly technical roles. Universally, they were far more concerned about assessing the generic skills, which they believed were vital for sustained, successful careers in their organisations. These findings support and highlight the need for ICT degrees to continue to provide strong technical foundations, but to ensure that students are given every opportunity to develop the generic skills to improve employability outcomes.

Employers tell us that the key skills required are problem solving, business acumen and project management. They rated teamwork and communication skills as the top two skills, and within communication skills, good listeners were highly sought after. With teamwork, the ability to reflect and identify contribution to a team was highly prized. In addition, the key attitudes of self-awareness, learning, flexibility, initiative, motivation were highly regarded by employers as markers of successful staff. Arrogance and an inability to speak up when necessary, or speaking out when inappropriate are some of the things which employers did not want to see in ICT graduates.

The next stage of the project will focus on consultation with academic staff and undergraduates to assess the impact of activities to develop employability skills. A series of focus groups will be undertaken with undergraduate students, to collect evidence about when and where students are developing generic skills. This will be followed by a series of workshops with staff responsible for curriculum design to map teaching activities and generic skill development in undergraduates. Following this series of interviews with academic staff will be undertaken to document good practice case studies. The study will conclude with interviews with graduates to seek more in depth views on generic skills required, perceived gaps and strategies to redress the gaps.

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