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## **Testing a model of undergraduate competence in employability skills and its implications for stakeholders**

### **Abstract**

Despite the development of employability skills being firmly entrenched in higher education's strategic agenda worldwide; recent graduates' standards in certain skills are not meeting industry expectations. This paper presents and tests a model of undergraduate competence in employability skills. It highlights those factors which impact on competence in employability skills and identify ways in which stakeholders can adjust curricula and pedagogy to enhance graduate skill outcomes. Data was gathered from an online survey of 1008 business undergraduates who self-rated their competence against a framework of employability skills typically considered essential in graduates. The data was analysed using multiple regression techniques. Results suggest a range of factors influence competence in employability skills. These include geographical origin, sex, work experience, engagement with the skills agenda, stage of degree studies, scope of relationships and activities beyond education and work and the quality of skills development in the learning programme. The implications for stakeholders in undergraduate education are discussed, highlighting their shared responsibility for ensuring undergraduate employability skills are developed to required industry standards. The model provides an important contribution to the multi-faceted concept of graduate employability, of which skill development forms an important part.

### **Keywords**

Graduate; undergraduate; employability; skills; competence.

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## Introduction

Enhancing the employability of graduating students features significantly in the strategic agenda of higher education providers worldwide. There has been a gradual shift in industry expectations of graduates from exhibiting academic expertise in a chosen discipline to a commercially aware candidate with a strong command of, and immediate ability to apply, a broad range of skills deemed essential in the workplace. The impetus for skill development in higher education has stemmed from growing pressures on industry from intense, global competition and rapid technological advances; renewed interest in graduate leadership skills; large supplies of graduates competing in increasingly soft labour markets and the shift to less hierarchical, and more self-managed, career pathways (see Smith and Kruger 2008).

Graduate employability is influenced by many different factors (Dacre Pool and Sewell 2007) yet typical models highlight the significant role of certain skills which assist graduates in applying their disciplinary knowledge in the workplace. In Australia, the origin of this study, these skills are typically referred to as employability skills although other terms, such as key, core, professional or generic skills, are commonly used. Employability skills broadly considered critical in graduating students span team working, communication, self-management and analytical skills (Business, Industry and Higher Education Collaboration Council [BIHECC] 2007); industry preferences appearing fairly consistent across several developed economies (Bowman 2010).

Despite recent efforts in examining employability skills in Eastern regions (see Gereffi, Fernandez-Stark, Bamber, Psilos and DeStefano 2011; Velde 2009), we have limited understanding of the differences in industry requirements and skill development processes between developed and developing economies. Given the strong similarities to Australian strategies for enhancing national skill outcomes by government, education and industry stakeholders, this paper's findings can confidently be extended to culturally-similar, developed regions such as North America, the UK and

Ireland. Documented alignment in the perceived meaning and importance of graduate employability skills, as well as similar initiatives for skill development, may extend these boundaries further.

The global focus on developing employability skills in undergraduates has catalysed a number of important changes in higher education. First, the emergence of frameworks defining employability skills, or graduate attributes, which graduating students from particular higher education providers are expected to master. These frameworks generally derive from national skills frameworks and typically address the same sets of skills and attributes with minor differences in terminology (Bowman 2010). Ambiguity at the frameworks' conceptual level; namely the interchangeable use of capabilities, competencies, skills, attributes and abilities, is problematic (Barrie 2006). Further, the different terminology used for individual skills is confusing and plagues empirical studies where stakeholder interpretations of the meaning of certain skills may differ significantly (Male and Chapman 2005). A prominent example is what precisely constitutes the skill set termed 'interpersonal skills' and how this relates to other skill sets such as team working and communication.

The treatment of institution-specific skill frameworks has generated a number of different approaches to employability skill development. The more favoured approach is to embed and assess learning outcomes into core, discipline-specific units which adequately address the framework (Bowman 2010). A more resource-intensive alternative is the creation of a standalone, or bolt-on, learning programme specifically dedicated to developing employability skills. Finally, the incorporation of work experience into undergraduate degree programmes, termed work-integrated learning [WIL], is fast becoming a popular complement and/or alternative to skill development (Freudenberg, Brimble, and Cameron 2011).

A further change is the increasing focus on the 'assurance of learning' of expected standards in graduate employability skills. This is apparent in standards for accrediting bodies, such as The Association to Advance Collegiate Schools of Business [AACSB], and discipline-based professional

associations. In Australia, the recently introduced Academic Teaching and Learning Standards (Australian Learning and Teaching Council [ALTC] 2010) provide threshold learning outcomes for all undergraduate degree programmes and heavily reinforce the constructive alignment of employability skill development to teaching, learning and assessment.

These changes have generated a number of problems including effectively clarifying precisely which skills industry requires and the standard to which graduates are expected to perform in the workplace. Further, difficulties in assessing and measuring skill outcomes are well documented (Halfhill and Nielsen 2007), aggravated by the conceptually ambiguous nature of certain skills such as emotional and social intelligence, initiative and confidence. The challenge of graduates successfully transferring these acquired skills across the very different contexts of the university classroom and the workplace raises a further problem (Hakel and Halpern 2005). Faculty appreciation of the complex nature of graduate employability in recent years has meant a growing departure from the tick box approach to managing prerequisite lists of graduate attributes (Tomlinson 2008). Acknowledgement that employability concerns “not a product but a process of learning” (Harvey n.d) has meant rigorous, and resource-intensive, efforts by many faculties to develop sound pedagogical practices in the teaching and learning of employability skills. This, in combination with increased administrative workloads, more diverse student cohorts and rising demand for research outcomes, puts more pressure on already time-constrained academics (see Pop-Vasileva, Baird, and Blair 2011).

Difficulty in engaging faculty with the permeation of skill development in undergraduate curricula is also a significant problem. Inertia to and challenge of the employability agenda exists among academics as the shift in focus from academic inquiry to work-readiness is perceived as devaluing higher education (Starkey and Tempest 2009). Skills development is perceived by some as more appropriate to industry than the university classroom. In their discussion of the changing role of Accounting graduates and where the educational responsibilities close and employers begin,

Kavanagh, Hancock, Howieson, Kent and Tempone (2010) consider the lack of interaction between educators and practitioners as preventing the achievement of industry needs. They discuss Wilson et al.'s (2009) differentiation between 'capability', acquired at university, and 'competence', that demonstrated in the workplace. Part of developing 'capability' is graduates learning how to reflect on applying their disciplinary knowledge in practice, rather than actually developing the practical skills. Woronoff (2009) also argues substantive, disciplinary knowledge is best taught at university and 'expertise', essentially the application and contextualisation of knowledge, in the workplace where graduates have access to meaningful practice opportunities and mentors. Although Woronoff believes the fostering of essential practical skills required to contextualise and apply knowledge should be taught in university, critiques of higher education's efforts to produce work-ready graduates must understand there will always be opportunity cost – in the form of knowledge development - due to resource constraints.

Overcoming Lauder's (2001) 'plug-in and play' mentality is necessary. Here, graduates arrive in the workplace armed with the required skill sets which can be successfully applied in a range of different contexts at the proverbial press of a button. Such unrealistic employer expectations and the continued criticism of higher education efforts will not enhance graduate skill outcomes. Parallel with this, academics must acknowledge the futility of resisting the skills movement as governments in developed economies continue their strategic focus on skill outcomes through, among other initiatives, national skill frameworks and conditional funding rules. A more desirable outcome would be enhanced on-campus collaboration and industry input into skill development using some of the professional learning pathways suggested by Papadopoulos, Taylor, Fallshaw, and Zanko (2010).

Industry's criticisms of higher education's efforts in developing certain employability skills extends to documented gaps in decision making, leadership, critical thinking and conflict management (see Jackson and Chapman 2012); team working (Confederation of British Industry [CBI] 2011) and communication skills (see Conrad and Newberry 2011). Higher education's response



has typically focused on the further research and development of sound practices in the teaching, learning and assessment of employability skills; integrating WIL into curricula and implementing extensive projects which map current offerings to ensure industry-alignment, see Oliver (2011) for a prominent example. There does, however, lack a holistic approach to understanding the factors which may influence undergraduate competence in employability skills and how curricula and pedagogy may be adjusted accordingly to enhance skill outcomes. There has been extensive modelling of graduate employability (see Dacre Pool and Sewell 2007) and exploration of the contribution of different factors to graduate workplace performance, such as WIL, skill development and labour market conditions (McQuaid and Lindsay 2005). Despite valuable research in this area, a greater understanding of the interacting forces which influence skill competence in undergraduates may enable stakeholders to identify and implement measures which enhance skill outcomes, thus bridging endemic skill gaps in graduating students.

The research objective of this study is to test a proposed model of undergraduate competence in employability skills. The aim is to highlight which factors impact on competence and, in light of the findings, identify ways in which educators – and other stakeholders – can better tease out undergraduate mastery of these skills. The objective will be addressed using data gathered from a quantitative survey of 1008 business undergraduate students completing a core employability skills programme in an Australian university. The paper will provide a background which presents the model and context in which it was tested, followed by an outline of methodology and a discussion of the results. Implications on and recommended practices for stakeholders in undergraduate education to enhance skill outcomes and better meet industry needs are then discussed.

## **Background**

### ***Proposed Model***

Figure 1 presents the proposed model of undergraduates' competence in employability skills. The model is derived from literature of stakeholder perceptions of graduate performance in

certain skills and conventional wisdom, the latter particularly in regard to the included demographic variables. [Insert Figure 1] The structural equation for the parent nominal variables is:

$$\text{Skills performance} = b_0 + b_1 \text{Continent} + b_2 \text{Sex} + b_3 \text{Stage} + b_4 \text{Age} + b_5 \text{Importance} + b_6 \text{Quality} + b_7 \text{Working status} + b_8 \text{Work experience} + b_9 \text{Major} + b_{10} \text{Life spheres} + e$$

A student's sex is included to explore suggestions that females report greater skill development as undergraduates (Wilton 2011). The student's continent of birth is incorporated to explore the impact of geographical origins on skills competence; particularly given 44% of participants were international students. Literature suggests that international students rate their competency levels in employability skills lower than local, Australian students (Graduate Careers Australia 2008). Conventional wisdom prompted the inclusion of the stage of the degree which a student has progressed to, and their age, as potential influences on their capabilities in certain skills.

There has been extensive literature in recent years on the value of work experience opportunities, in the form of part-time working and WIL, and their positive impact on competence in employability skills (Freudenberg et al. 2011). This has been captured by two different variables in the model: current working status and experience in a range of different roles prior to completing the skills audit. Wheeler (2008) highlights the importance of what she refers to as 'life spheres', those activities and relationships which extend beyond education and work hours, on acquiring managerial competencies. She examined the impact of multiple life spheres on part-time MBA students and concluded there was a positive relationship between the number of relationships across life spheres and performance in certain competencies.

Student engagement with the employability agenda, termed perceived importance in the model, and their motivation to develop employability skills is likely to impact on competence (Nilsson 2010). Further, quality of skill development is included as a predictor to gauge the impact of learning programme approach on skill outcomes (Ballantine and McCourt Larres 2007).

### **Context of study**

The context for testing the proposed model is a core employability skills programme for undergraduates completing a Bachelor in Business programme in a West Australian university. The programme comprises four units – two in the first year, one in the second year and the fourth unit in the student’s final year – and is based on the ethos of skill development through student-centred learning. The content of the programme is constructively aligned with an employability skills framework, see Table 1. **[Insert Table 1]** The recently developed framework broadly represents skills typically required by industry in business undergraduates. It derives from an extensive review of literature and employer-based studies on required skills in undergraduates (see Jackson 2010).

The framework comprises 10 skills and 40 constituent behaviours. The detailed behaviour descriptors aim to overcome ambiguity in the precise meaning of certain skills and the interplay of different definitions which plague studies on stakeholder perceptions on employability skills (see Tymon 2011). Homogeneous interpretation of the skill meanings, and their application in the workplace, is essential for the effective evaluation of skill outcomes. Students enrolled in a unit in the employability skills programme are required to complete a Skills Audit where they self-assess their capabilities against each of the behaviours in the framework. This form of reflection is critical for evaluating the effectiveness of the programme and for reinforcing student learning (Zubizarreta 2009).

## **Method**

### ***Participants***

Across the 1232 students enrolled in the employability skills programme, 1008 students completed the entire Skills Audit and agreed to their results being used for research purposes. Of these, 212 were studying Unit One (first year); 337 Unit Two (first year); 209 in Unit Three (second year) and 250 in Unit Four (final year). Fifty five percent of the sample was female and 86% were completing a Bachelor of Business with a broad range of single, double and triple majors. Remaining students were studying a degree from Law and Justice, Urban and Regional Planning and Sport,

Tourism and Hospitality Management programmes within the Faculty of Business and Law. Seventy eight percent of the sample was aged 25 and under; only 3% were aged 41 or above. Forty two percent were born in Asia, 10% in Africa, 8% in Europe and 40% in Australasia.

In regard to work status, 24% of the sample did not currently work in paid employment; 53% worked between 10 and 29 hours per week and only 8% worked full-time. Work experience among the sample varied. In trainee positions under constant supervision, 38% had no experience; 57% had one to three years and 5% had four years or more. For positions with little or no supervision, 31% had no experience; 49% had one to three years and 20% had four years or more. Finally, 65% had no experience in a supervisory role, 28% had one to three years experience and 7% four years or more.

### ***Instrument***

To address the research objectives, students completed an online audit of their capabilities in the behaviours defined in the employability skills framework. The survey instrument was pretested by a number of academics in the learning programme. First, information on the demographic variables was captured. Four dummy variables were created for continent of birth – Australasia, Asia, Europe and Africa. There were no students from the Americas in the sample. Dummies were created for sex and stage of degree, the latter gauged by whether students were completing Unit One, Two, Three or Four in the employability skills programme. Students were asked to state their age and, if applicable, their first, second and third majors which were merged into dummy variables comprising Accounting and Finance; Economics; Sports, Hospitality, Tourism and Events Management; Human Resources; Management; Marketing and Other.

Regarding life spheres, students were asked to indicate which of the following activities they participated in beyond work and education hours: activities with family members; personal leisure activities other than with family members; professional affiliations outside of work; community and civic activities (such as voluntary work) and activities with a church or spiritual group. Their yes/no responses were merged into a set of five dummy variables. Information on work experience was

captured in two ways. First, students were asked how many hours they worked in paid employment each week to indicate their current working status. Next they were asked to state the number of years they had worked in trainee, autonomous and supervisory positions to gauge prior work experience.

To measure perceptions on the importance of employability skill development, students rated - on a scale of one to seven - the importance of developing those skills defined in the programme's framework in today's business undergraduate degree programmes. One was defined as 'not important at all' and seven as 'extremely important'. The quality of skill development was measured by students rating – on a sliding scale of one to ten - how well their particular unit had developed each of its designated core skills. A composite score was calculated, representing the average rating across all of the unit's core skills. The dependent variable, competence in employability skills, was measured by a composite score of the students' self-assessed ratings – on a sliding scale of one to ten – in performing each of the behaviours from the skills framework in the workplace. A rating of one indicated an inability to perform the behaviour in the workplace and ten an expert and able to teach others.

### ***Procedures***

Students enrolled in the four units within the employability skills programme completed the Audit electronically during October 2011. There was no more than a two week lag for students within a particular unit completing the Audit to ensure they were at the same stage of skill development. Students completed the Audit in the latter half of semester and, for those enrolled on campus, were allocated class time for submission. Off campus students were encourage to complete the Audit via electronic mail and announcements on the university's learning management system.

### ***Limitations of study***

First, the study utilises students' self-assessed ratings to measure the dependent variable of competence in certain employability skills. Debate on the integrity of self-assessment is well-

documented (Allen and Van Der Velden 2005; MacDonald 2011). It is noted, however, that literature emerging from graduate skills performance, including that with which findings are compared and upon which the model is based, derives predominantly from stakeholder perceptions; albeit employer, academics or the graduates themselves. To overcome issues of bias and disparities in perceptions, a model based on 360 degree assessments of relevant stakeholder groups would certainly be superior.

There are also limitations posed by the sample deriving from a single source as exploration of the impact of learning programme type and approach (Ballantine and McCourt Larres 2007), institutional type (Wilton 2011) and the degree qualification (Smith and Kruger 2008) on skill outcomes cannot be gauged. The significant proportion of international students in the study may raise concerns yet convention dictates they are likely to migrate and work in Australia following their degree studies (see Keneley and Jackling 2011). Further, retrospectively, it is noted that including behaviour names within the actual behaviour descriptors –see ‘reasoning’ within the ‘problem solving’ skill set as an example – does not assist with efforts to eliminate ambiguity and achieve homogenous interpretations of the precise meaning of each behaviour and the holistic skill sets.

## **Results and Discussion**

As part of the preliminary analysis, a histogram for each of the predictor variables was examined and skewness and kurtosis computed to identify any departures from normality. Measures were within what are broadly considered ‘normal limits’, Kurtosis indices of less than 10 and skew statistics less than 5 (see Curran, West, and Finch 1996), for all variables except those measuring work experience as a trainee, autonomous worker and supervisor. A log transformation was successfully applied to these three variables. Casewise deletion was considered appropriate for any missing values as this accounted for less than 1% of the overall sample, a relatively small loss of data (Raymond and Roberts 1987) which reduced the sample to  $n=1002$ .

The results of the ordinary least-squares regression analysis of earnings are presented in Table 2 [**Insert Table 2**]. The regression coefficients indicate the expected change in ratings of competence in employability skills, in units of one on a scale of one to ten, for a unit change in the relevant independent variable, holding constant the other variables in the model. Significant results ( $\alpha=0.05$ ) are highlighted \* although it is important to remember that statistically insignificant results may also be substantively important. The chosen base variables for continent of birth, stage of degree, major and life spheres; those being Australasia, unit one, Accounting and Finance and activities with a church/spiritual group respectively, are absent from the table. Upon examining the standardised regression residuals, there were 8 cases classed as outliers due to exceeding three in absolute value. These cases were removed from the analysis and are not included in the results, resulting in a final sample of  $n=994$ . Otherwise, histograms and scatter plots indicated the residuals demonstrated normality.

Bivariate correlations did not fall in the problematic range above 0.6 where substantial risks may be posed for Type II errors (Grewal, Cote, and Baumgartner 2004). The Variance Inflation Factor (VIF) and tolerance were also computed to investigate multicollinearity. VIF coefficients ranged from 1.049 to 2.129 which are relatively small and suggest the instability associated with multicollinearity is absent. Tolerance, a measure of the unique contribution of each variable to the model, ranged from 0.470 to 0.953 which is within acceptable limits; particularly given the use of dummy variables in the analysis (Chan 2004). The Durbin-Watson test statistic is  $d=1.968$ , lying close to the critical value of two and indicating there is no first order linear auto-correlation in the data (Norusis 2008). Further, a scatter plot of studentised residuals against regression standardised predicted values precluded heteroscedasticity.

Regarding demographic characteristics, continent played a mixed role in influencing skill ratings. With Australasian students as the omitted base variable, Asian students have a significantly lower competence composite score. In order to test whether continent, in its collective form, has a

statistically significant impact on perceived competence, a joint test ( $\alpha=0.05$ ) for the set of dummy variables was undertaken. Table 3 indicates there was a significant change in  $R^2$  which confirms continent, as a parent variable, contributes significantly to the regression analysis. **[Insert Table 3]**

Keneley and Jackling (2011) also observed differences in domestic (Australian) and international students' self-ratings of competence in certain skills and behaviours. Their findings indicated international undergraduates believed their Accounting studies aided their development of employability skills more than local students. Keneley and Jackling attributed this largely to differences in the education models of the two cohorts prior to university; Asia focusing more on the acquisition of discipline-related skills with less exposure to settings typically used for developing employability skills in the West, such as group-based learning and assessment. This may explain differences in the composite score of students from different continents and highlights the potential influence of prior formal skill development on undergraduate perceptions of competence. Interestingly, Goldfinch and Hughes' (2007) study of Scottish undergraduates found nationality and ethnic grouping did not influence student confidence in employability skills.

Results indicated significantly lower competence ratings for males than females, aligning with Wilton's (2011) study where female graduates reported greater possession of employability skills than their male counterparts. Wilton's study indicated that this did not, however, translate into equal or enhance employment outcomes. Smith and Kruger's (2008) study of business undergraduates reported greater perceived competence in interpersonal skills among females, more specifically team working, assertiveness, political and networking skills, and Goldfinch and Hughes (2007) that females are slightly more confident in their evaluation and numeracy skills than males.

As would be expected, the stage of the degree significantly impacted on perceived competence; students from the later units achieving higher composite scores than students from the first unit. While this is a positive result as the programme aims to scaffold employability skill development throughout the programme, it may be attributed also to the parallel sequential



development of skills in core, disciplinary units comprising the Bachelor of Business. A joint test ( $\alpha=0.05$ ) for the dummies defining stage of degree confirmed that, as a set, they have a significant impact on perceived competence in employability skills (see Table 3).

Results indicated that age has little impact on competence ratings; stage of degree possibly a better indicator of student progress as cohorts entering higher education become increasingly diverse (Jeffrey 2009). Finally, with Accounting and Finance as the base major, there was only a significant impact for Economics students on the composite competence scores. The more useful joint test ( $\alpha=0.05$ ) confirms that a student's major did not have a significant impact on perceived competence in employability skills (see Table 3). This supports other findings that disciplines within the field of business have little impact on stakeholder perceptions of graduate performance in employability skills in the workplace (Jackson and Chapman 2012).

Membership of a professional affiliation had a significant, positive impact on assessments of competence in relation to the base variable of activities with a church/spiritual group. As summarised in Table 3, a joint test indicates a statistically significant change in model fit ( $\alpha=0.05$ ) and suggests life spheres contribute significantly to the regression analysis. Aligning with this, Poropat (2011) studied the impact of 'citizenship performance' and noted the complementary nature of citizenship and employability skill outcomes. His findings indicated that citizenship enhances both academic performance and long-term graduate employability.

Work experience appears critical to perceived competence in employability skills. Both the number of hours worked in paid employment each week and the number of years in supervisory or autonomous roles with little or no supervision had a positive impact on competence ratings, supporting empirical studies which indicate the significant influence of work experience on perceived skills competence (Smith and Kruger 2008). Interestingly, experience as a trainee working under constant supervision had a significantly negative impact on competence ratings. This suggests

positions which offer little scope for undergraduates to actively and creatively apply their learning are detrimental to self-belief in mastering employability skills.

Participants' perception of the importance of developing employability skills in business undergraduate programmes positively impacted on perceived competence. This link aligns with learning theory that engagement with learning goals is essential for achieving effective outcomes (Tymon 2011). Further, and in alignment with conventional wisdom, the better the unit developed its assigned core skills, the higher the competence ratings.

We are principally concerned with evaluating the impact of each independent variable on undergraduate perceptions of performance in employability skills in the workplace, indicated by the  $p$ -values and confidence intervals in Table 2. The  $R^2$  value of 0.31 indicates a reasonable goodness of fit in the overall model. As the residuals are deemed to be approximately normally distributed, about two thirds of the cases have residuals less than the standard error estimate (SEE), in this case 0.92 and calibrated in competence rating units on the scale of one to ten. The associated standard error for each coefficient, expressed in competence rating units, is modest and indicates a fair degree of precision in estimating coefficients in a repeated sampling framework. This may be due to the large sample size and the relatively large number of parameters in the model although possibly counter-influenced by the overall model fit.

In regard of respecifying the model to improve overall fit, a measure of prior formal skill development, such as schooling (Smith and Green 2005) or possibly the entry pathway into university, particularly with increasingly large numbers of international enrolments – may be beneficial. Further, the introduction of confidence as a mediating variable; particularly if self-assessed ratings are used, may improve our understanding of the precise impact of geographical origin on competence.

### **Implications for practice**

Although self-reporting data has been used in this study, undergraduates are asked to consider their capabilities in regard to actual workplace performance, rather than how they would like to perform. Despite this, inflated self-perceptions and an overall lack of humility are often associated with recent graduates (Papadopoulos 2010) so assuming perceived competence represents actual performance should be exercised with caution. Nevertheless, there is considerable alignment with existing literature and it is hoped the model contributes further to our understanding of influences on employability skills performance in graduates.

Results suggest a range of factors influence perceived competence in employability skills with multiple implications for educators. First, Asian students at the same stage of their university degree as Australians feel capable of performing employability skills in a workplace setting, aligning with other studies identifying disparities in certain skills (Keneley and Jackling 2011). In Australia, Asians form 81% of international student enrolments (Department of Education, Employment and Workplace Relations [DEEWR] 2010), urging further exploration into why these differences exist and the development of more culturally sensitive pedagogical approaches with diverse student cohorts.

The study also suggests that, controlling for other variables in the model; females believe they are more competent in employability skills than their male counterparts. Further investigation into their different learning styles may engender the development of more gender-sensitive approaches for enhancing perceived competence and actual skill outcomes.

Student ratings suggest employability skills performance improves as they progress through the bolt-on employability skills programme. The programme enables students to sequentially develop and scaffold their learning in a coordinated fashion, most likely guided by the integral skills framework. It is far easier to implement and manage sequential development in a standalone programme dedicated to employability skill outcomes than across a number of core, discipline-specific units which may lack a holistic approach due to inertia and resource restraints. The bolt-on

approach may therefore prove a useful tool for some institutions (Smith and Kruger 2008) although the importance of providing disciplinary context to the programme is critical (Barrie 2004).

A student's degree major appears to make little difference to perceived competence in employability skills. This, however, may be skewed by the nature of the sample as it is based entirely within the Faculty of Business and Law. There would be significant value in extending testing of the model across different faculties to understand the broader influence of discipline on competence. This may assist universities in deciding whether to adopt a university-wide, cross-disciplinary approach to skill development, or more specific learning outcomes tailored to specific areas.

The study reaffirms the collective importance of life spheres on undergraduates' perceived competence in certain employability skills. Across a range of disciplines, the value of networking, voluntary and community duties (Bourner and Millican 2011) and social groups and sports clubs (Stuart et al. 2011) are widely acknowledged as enhancing graduate employability. Wheeler's (2008) study of life spheres suggested that the number of activities does not impact on competence in managerial competencies, only that they span across the different life spheres. It is therefore important that students carefully select and prioritise which relationships and activities they establish during their undergraduate years to improve skill development. Educating undergraduates on the importance of life experience during their studies, and beyond, is vital. This may be embedded into curricula or through stand-alone delivery by career development advisors or similar. The inclusion of opportunities which contribute to an undergraduate's life experience – such as voluntary placements and field trips – should be regularly reviewed by curriculum designers. Although there is evidence of extra-curricular programmes for student development (see Muldoon 2009), implementation may be difficult due to funding and occupational health and safety considerations restraints.

A student's perception of the importance of employability skill development impacts on their competence ratings, aligning with Smith and Kruger (2008) findings that interest in skill

development resulted in varying perceptions of skill outcomes. Assuming a degree of alignment between perceived competence and actual performance, this highlights the importance of engaging students with the employability agenda and the need to develop a broad range of skills, alongside disciplinary expertise. Again, students in the study may be more engaged with the importance of skill development, and what constitutes employability, due to the continuous dissemination of and assessment against the programme's employability skills framework. Further, undergraduates' work experience appears paramount to skill levels. Universities should ensure they are catering for student needs through the provision of off-campus study options and class times which suit a range of workplace commitments. Opportunities for work experience within the curriculum – through internship, sandwich programme and/or WIL opportunities – are vital. The value of WIL in developing graduate work-readiness through integrating theory and practice is increasingly recognised (Smith, Kielley-Coleman, and Meijer 2010) and universities are responsible for designing programmes which provide adequate access for students.

Similarly employers should ensure they are amenable to their workforce's commitment to undergraduate study by providing study leave, as appropriate, and flexibility in their work hours. Businesses should also understand and value the many ways it may contribute to students' workplace learning. This may extend to providing WIL/placement opportunities which allow students to work autonomously and provide a valuable and meaningful experience to candidates. They should be given a degree of responsibility and encouraged to exercise their initiative and creativity. Incorporating reflection into WIL, the responsibility of both educators and host employers, will add sense and meaning to knowledge and skill acquisition (Smith et al. 2010), enhancing their ability to transfer across different contexts (Clarke 2002).

In addition to work placements, other initiatives aimed at bringing industry and education closer together may benefit undergraduate competence in employability skills. This may include professional speaker sessions, voluntary placement opportunities and industry-partnered

networking events and competitions (Papadopoulos et al. 2010). Liaising with academics, on consultative committees or advisory groups, does not often facilitate collaborative teaching and learning among industry and education partners or the direct interaction students need with managers, supervisors, mentors and previous graduates to fine tune their employability skills. Meredith and Burkle (2008) highlight the advantages of authentic learning using live classroom projects based on active firms requiring informed analysis and decision making processes in high pressured environments. Further, the secondment of lecturers and professionals between the university and workplace settings may also prove valuable in enhancing undergraduate skill development (Smith and Kruger 2008) as parties better appreciate each others' needs and parameters of learning and applying skills.

As stakeholders in undergraduate education, professional associations should also evaluate their relationships with student bodies. Cheaper membership options, greater access to networking events and more transparent accreditation standards may enhance undergraduate skill outcomes. The model also highlights some important points for students in their bid to contend successfully in increasingly competitive graduate labour markets. Building up life experience through leisure activities, club memberships and voluntary work and networking with industry and employers through professional association membership and work experience not only enhance ones' résumé but are vital for mastering skills deemed essential for graduate work-readiness. Undergraduates should engage with the employability agenda and consider carefully their choice of leisure activities and work roles. Significant numbers of undergraduates now have to work on a part-time basis to support their studies (McMillan 2005) but clearly it is important to secure relevant, autonomous and responsible positions.

### **Concluding comments**

The model provides an important contribution to our understanding of undergraduate competence in a broad range of industry-relevant skills typically considered vital for graduate

employability. Its' significance extends further as competence in certain employability skills aids academic development (Baker and Henson 2010; Goldfinch and Hughes 2007), supporting Knight and Yorke's (2003) premise that the divide between academic and employability skills is imaginary. It also reaffirms that undergraduate competence in employability skills is not the sole responsibility of higher education practitioners.

It is, however, important to remember that employability skills form only one, albeit significant, aspect of graduate employability. Disciplinary knowledge, macroeconomic and labour market conditions (McQuaid and Lindsay 2005), learning transfer (Jackson and Hancock 2010) and job mobility (Wittekind, Raeder and Grote 2009) each influence employability. This model therefore forms only an initial, yet valuable, stage in understanding the bigger picture of what makes a graduate work-ready. Future studies embracing the multi-dimensional nature of graduate employability and any disparities in influential factors among different geographical regions would significantly add value to global efforts to improve graduate employability.

## References

- Allen, J., and R. Van Der Valden. 2005. *The role of self-assessment in measuring skills*. Maastricht, Netherlands: Research Centre for Education and the Labour Market.
- Australian Learning and Teaching Council [ALTC]. 2010. *Learning and teaching academic standards project – final report*. Strawberry Hills, NSW: ALTC.
- Ballantine, J., and P. McCourt Larres. 2007. Cooperative learning: A pedagogy to improve students' generic skills. *Education + Training* 49, No. 2: 126-137.
- Baker, G., and D. Henson 2010. Promoting employability skills development in a research-intensive university. *Education + Training* 52, No. 1: 62-75.
- Barrie, S. 2004. A researched-based approach to generic skills graduate attributes policy. *Higher Education Research and Development* 23, No. 3: 261–275
- Barrie, S. 2006. Understanding what we mean by generic attributes of graduates, *Higher Education* 51, No. 2: 215–241
- Bourner, T., and J. Millican. 2011. Student-community engagement and graduate employability. *Widening Participation and Lifelong Learning* 13, No. 2: 68-85.
- Bowman, K. 2010. *Background paper for the AQF Council on generic skills*. Retrieved from <http://www.aqf.edu.au/Portals/0/Documents/Generic%20skills%20background%20paper%20FINAL.pdf>
- Chan, Y. 2004. Biostatistics 201: Linear regression analysis. *Singapore Medical Journal* 45, No. 2: 55-61.
- Clarke, N. 2002. Job/work environment factors influencing training transfer within a human service agency: Some indicative support for Baldwin and Ford's transfer climate construct. *International Journal of Training and Development* 6, No. 3: 146-162.
- Confederation of British Industry [CBI]. 2011. *Building for growth: business priorities for education and skills – Education and skills survey 2011*. London: CBI.
- Conrad, D., and R. Newberry. 2011. 24 Business communication skills: Attitudes of human resource managers versus business educators. *American Communication Journal* 13, No. 1: 4-23.
- Curran, P., West, S., and J. Finch. 1996. The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods* 1: 16-29.
- Dacre Pool, L., and P. Sewell. 2007. The key to employability: Developing a practical model of graduate employability. *Education + Training* 49, No. 4: 277-289.
- Department of Education and Employment and Workplace Relations [DEEWR]. 2010. International Student Enrolments in Higher Education in 2009. Retrieved from <http://aei.dest.gov.au/AEI/PublicationsAndResearch/Snapshots/Default.htm>
- Freudenberg, B., Brimble, M., and C. Cameron. 2011. WIL and generic skill development: The development of business students' generic skills through work-integrated learning. *Asia-Pacific Journal of Cooperative Education* 12, No. 2: 79-93.
- Gereffi, G., Fernandez-Stark, K., Bamber, P., Psilos, P. and J. DeStefano. 2011. *Meeting the upgrading challenge: dynamic workforces for diversified economies*. Durham, NC: Center on Globalization, Governance & Competitiveness, Duke University.
- Goldfinch, J., and M. Hughes. 2007. Skills, learning styles and success of first-year undergraduates. *Active Learning in Higher Education* 8, No. 3: 259-273.
- Graduate Careers Australia. 2008. *University and Beyond 2007—International Students*. Melbourne: GCA.
- Grewell, R., Cote, J. and H. Baumgartner. 2004. Multicollinearity and measurement error in structural equation models: implications for theory testing. *Marketing Science* 23, No. 4: 519-529.
- Hakel, M., and D. Halpern. 2005. How far can transfer go: Making transfer happen across physical, temporal and conceptual space. In *Transfer of Learning from a modern multidisciplinary perspective*, ed J. Mestre, 357-370. Greenwich, CT: Information Age Publishing.



Halfhill, T., and T. Nielsen. 2007. Quantifying the 'softer side' of management education: An example using teamwork competencies. *Journal of Management Education* 31, No. 1: 64-80.

Harvey, L. n.d. *On employability*. Retrieved from <http://www.heacademy.ac.uk/resources>

Jackson, D., and Chapman, E. 2012. Non technical skill gaps in business graduates. *Education + Training* 54, No. 2/3. Retrieved through EarlyCite from <http://www.emeraldinsight.com/journals.htm?articleid=17010407&show=abstract>

Jackson, D., and P. Hancock. 2010. Non-technical skills in undergraduate degrees in business: development and transfer. *Education, Research and Perspectives* 37, No 1: 52-84.

Jackson, D., Sibson, R., and L. Riebe. Under review. Updating employability skills framework: An Australian case study. *International Journal of Management Education*.

Jeffrey, L. 2009. Learning orientations: Diversity in higher education. *Learning and Individual Differences*, 19: 195-208.

Kavanagh, M., Hancock, P., Howieson, B., Kent, J., and Tempone, I. 2010. *Who Should Teach What? Perceptions of the Roles of Universities and Practice in the Education of Professional Accountants*. Paper presented at Accounting & Finance Association of Australia and New Zealand Conference, 3-6 July, Christchurch, New Zealand.

Keneley, M., and B. Jackling. 2011. The Acquisition of Generic Skills of Culturally-diverse Student Cohorts. *Accounting Education: An International Journal* 20, No. 6: 605-623.

Knight, P., and M. Yorke 2003. Employability and good learning in higher education. *Teaching in Higher Education* 8 No. 1: 3-16.

Lauder, H. 2001. Innovation, Skill Diffusion and Social Exclusion. In *High Skills: Globalization, Competitiveness and Skill Formation*, ed. P. Brown, A. Green and H. Lauder, Oxford: Oxford University Press.

MacDonald, K. 2011. A reflection on the introduction of a peer and self-assessment initiative. *Practice and Evidence of Scholarship of Teaching and Learning in Higher Education* 6, No. 1: 27-42.

Male, S., and E. Chapman. 2005. Assessing the generic competencies of engineering graduates. Global Colloquium on Engineering Education, Sydney. Retrieved from <http://www.aeee.com.au/conferences/papers/2005/Paper/Paper203.pdf>.

McMillan, J. 2005. *Course Change and Attrition from Higher Education: Longitudinal Surveys of Australian Youth*. Camberwell, Vic: Australian Council for Educational Research [ACER].

McQuaid, R., and C. Lindsay. 2005. The Concept of Employability. *Urban Studies* 42, no. 2: 197-219.

Meredith, S., and M. Burkle. 2008. Building bridges between university and industry: Theory and practice. *Education + Training* 50, No. 3: 199-215.

Muldoon, R. 2009. Recognising the enhancement of graduate attributes and employability through part-time work while at university. *Active Learning in Higher Education* 10, No. 3, 237-252.

Papadopoulos, T. 2010. Beyond discipline and technical knowledge: industry perspectives on the business curriculum. *Industry and Higher Education* 24, No 2: 109-116.

Papadopoulos, T., Taylor, T., Fallshaw, E., and M. Zanko. 2010. *Engaging industry: Embedding professional learning in the business curriculum*. Strawberry Hills, NSW: Australian Learning and Teaching Council.

Nilsson, S. 2010. Enhancing individual employability: The perspective of engineering graduates. *Education + Training* 52, No. 6/7: 540-551.

Norusis, M. 2008. *SPSS Statistics 17.0 Statistical procedures companion*. Upper Saddle River, NJ: Prentice-Hall.

Oliver, B. 2011. *Assuring Graduate Capabilities: Good Practice Report*. Retrieved from <http://www.altc.edu.au/resource-assuring-graduate-outcomes-curtin-2011>.

Pop-Vasileva, A., Baird, K., and B. Blair. 2011. University corporatisation: The effect on academic work-related attitudes. *Accounting, Auditing and Accountability Journal* 24, No. 4: 408-439.

Poropat, A. 2011. The role of citizenship performance in academic achievement and graduate employability. *Education + Training* 53, No. 6: 499-514.

- Raymond, M., and D. Roberts. 1987. A comparison of methods for treating incomplete data in selection research. *Educational and Psychological Measurement* 47: 13-26.
- Smith, E., and A. Green. 2005. *How workplace experiences while at school affect career pathways*. Adelaide: National Centre for Vocational and Educational Research.
- Smith, J., Meijer, G, and N. Kielly-Coleman. 2010. Assurance of learning : the role of work integrated learning and industry partners. In *Work Integrated Learning : Responding to Challenges*, ed M. Campbell, 409-419. Perth, WA: Australian Collaborative Education Network [ACEN].
- Smith, E., and J. Kruger. 2008. A critical assessment of the perceptions of potential graduates regarding their generic skill level: An exploratory study. *SAJEMS NS* 11, No 2: 121-138.
- Starkey, K., and S. Tempest. 2009. The winter of our discontent: The design challenge for business schools. *Academy of Management, Learning and Education* 8, No. 4: 576-586.
- Stuart, M., Lido, C., Morgan, J., Solomon, L. and S. May. 2011. The impact of engagement with extra-curricular activities on the student experience and graduate outcomes for widening participation populations. *Active Learning in Higher Education* 12, No. 3: 203-215.
- Tomlinson, M. 2008. The degree is not enough: students' perceptions of the role of higher education credentials for graduate work and employability. *British Journal of Sociology of Education* 29, No. 1: 49-61.
- Tymon, A. 2011. The student perspective on employability. *Studies in Higher Education*, iFirst Article. Retrieved from <http://dx.doi.org/10.1080/03075079.2011.604408>.
- Velde, C. 2009. Employers perception of graduate competencies and future trends in higher vocational education in China. *Journal of Vocational Education and Training* 61, No. 1: 35-51.
- Wheeler, J. 2008. The impact of social environments on emotional, social, and cognitive development. *Journal of Management Development* 27, No. 1: 129-145.
- Wilson, R., Pierce, A., Allison, M., Hoogendoorn, M., Kral, B., and K. Watty. 2009. Accountancy and Academic/Professional Inter-Dependency (or Mutual Exclusivity?). *Accounting in Europe* 6, No. 2: 149 – 166.
- Wilton, N. 2011. Do employability skills really matter in the UK graduate labour market? The case of business and management graduates. *Work Employment Society* 25, No. 1, 85–100.
- Wittekind, A., Raeder, S., and G. Grote. 2010. A longitudinal study of determinants of perceived employability. *Journal of Organizational Behavior* 31: 566-586.
- Woronoff, M., 2009. *What Law Schools Should Teach Future Transactional Lawyers: Perspectives from practice*. UCLA School of Law, Law-Econ Research Paper No. 09-17. Available at SSRN: <http://ssrn.com/abstract=1430087> or <http://dx.doi.org/10.2139/ssrn.1430087>
- Zubizarreta, J. 2009. *The learning portfolio: reflective practice for improving student learning*. Bolton, MA: Anker.

**Table 1 Employability skill framework (adapted from Jackson, Sibson and Riebe, n.d.)**

<b>Employability Skill</b>	<b>Behaviour</b>	<b>Descriptor</b>
<i>Working effectively with others</i>  <i>Core to Units One, Two and Three</i>	Task collaboration	Complete group tasks through collaborative communication, problem solving, discussion and planning.
	Team working	Operate within, and contribute to, a respectful, supportive and cooperative group climate.
	Social intelligence	Acknowledge the complex emotions and viewpoints of others and respond sensitively and appropriately.
	Cultural and diversity awareness	Work productively with people from diverse cultures, races, ages, gender, religions and lifestyles.
	Influencing others	Defend and assert their rights, interests and needs and convince others of the validity of one's point of view.
	Conflict resolution	Address and resolve contentious issues with key stakeholders.
<i>Communicating effectively</i>  <i>Core to Unit One</i>	Verbal communication	Communicate orally in a clear and sensitive manner which is appropriately varied according to different audiences and seniority levels.
	Giving and receiving feedback	Give and receive feedback appropriately and constructively.
	Public speaking	Speak publicly and adjust their style according to the nature of the audience.
	Meeting participation	Participate constructively in meetings.
	Written communication	Present knowledge, in a range of written formats, in a professional, structured and clear manner.
<i>Self-awareness</i>  <i>Core to Units One and Four</i>	Meta-cognition	Reflect on and evaluate personal practices, strengths and weaknesses in the workplace.
	Lifelong learning	Actively seek, monitor and manage knowledge and sustainable opportunities for learning in the context of employment and life.
	Career management	Develop meaningful and realistic career goals and pathways for achieving them in light of labour market conditions.
<i>Thinking critically</i>  <i>Core to Unit Two</i>	Conceptualisation	Recognise patterns in detailed documents and scenarios to understand the 'bigger' picture.
	Evaluation	Recognise, evaluate and retain key points in a range of documents and scenarios.
<i>Analysing data and using technology</i>  <i>Core to Unit Two</i>	Numeracy	Analyse and use numbers and data accurately and manipulate into relevant information.
	Technology	Select and use appropriate technology to address diverse tasks and problems.
	Information management	Retrieve, interpret, evaluate and interactively use information in a range of different formats.
<i>Problem Solving</i>  <i>Core to Unit Three</i>	Reasoning	Use rational and logical reasoning to deduce appropriate and well-reasoned conclusions.
	Analysing and diagnosing	Analyse facts and circumstances and ask the right questions to diagnose problems.
	Decision making	Make appropriate and timely decisions, in light of available information, in sensitive and complex situations.
<i>Developing initiative and</i>	Entrepreneurship/ Intrapreneurship	Initiate change and add value by embracing new ideas and showing ingenuity and creativity in addressing challenges and problems.

enterprise	Lateral thinking / creativity	Develop a range of solutions using lateral and creative thinking.
<i>Core to Unit Two and Three</i>	Initiative Change management	Take action unprompted to achieve agreed goals. Manage change and demonstrate flexibility in their approach to all aspects of work.
Self- management	Self-efficacy	Be self-confident in dealing with the challenges that employment and life present.
<i>Core to Unit Three</i>	Stress tolerance Work / life balance	Persevere and retain effectiveness under pressure or when things go wrong. Demonstrate the importance of well being and strive to maintain a productive balance of work and life.
	Self-regulation	Reflect on and regulate their emotions and demonstrate self-control.
Social responsibility and accountability	Social responsibility Accountability Personal ethics	Behave in a manner which is sustainable and socially responsible (e.g., consistent with company policy and/or broader community values). Accept responsibility for own decisions, actions and work outcomes. Remain consistently committed to and guided by core values and beliefs such as honesty and integrity.
<i>Core to Units Three and Four</i>	Organisational awareness	Recognise organisational structure, operations, culture and systems and adapt their behaviour and attitudes accordingly.
Developing professionalism	Efficiency	Achieve prescribed goals and outcomes in a timely and resourceful manner.
<i>Core to Unit Four</i>	Multi-tasking Autonomy Time management Drive Goal and task management	Perform more than one task at the same time. Complete tasks in a self-directed manner in the absence of supervision. Manage their time to achieve agreed goals. Go beyond the call of duty by pitching in, including undertaking menial tasks, as required by the business. Set, maintain and consistently act upon achievable goals, prioritised tasks, plans and realistic schedules.

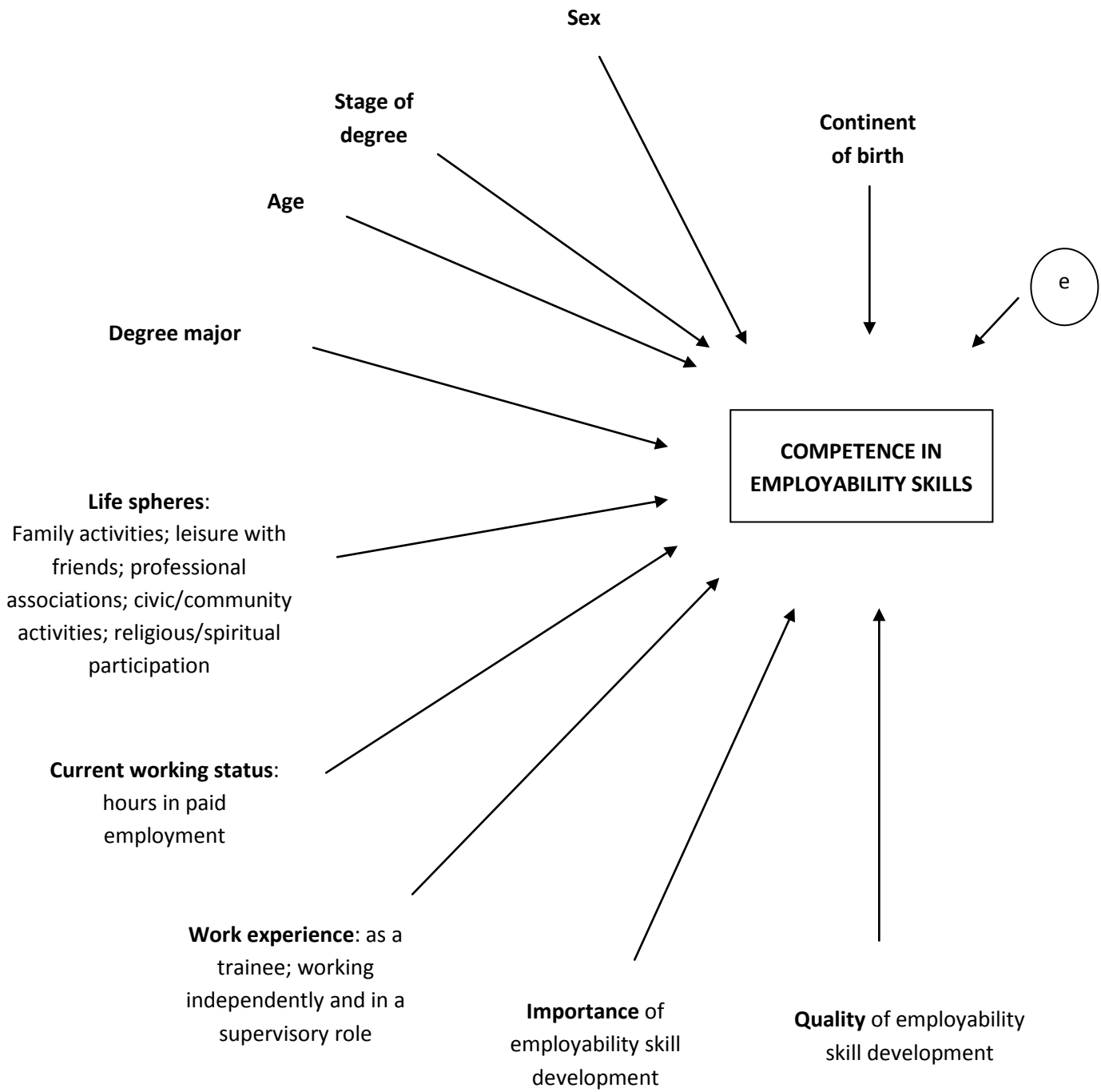
**Table 2 Regression analysis of competence in employability skills**

<b>Variable</b>	<b>Regression coefficient</b>	<b>Standard Error</b>	<b>95% Confidence Limits</b>	<b>p-value</b>
Continent: Asia	-0.53	0.08	[-0.69, -0.38]	0.000*
Continent: Africa	0.18	0.11	[-0.04, 0.39]	0.107
Continent: Europe	-0.10	0.12	[-0.33, 0.13]	0.389
Sex	-0.13	0.06	[-0.25, -0.01]	0.038*
Stage: Unit Two	0.36	0.08	[0.20, 0.52]	0.000*
Stage: Unit Three	0.36	0.09	[0.18, 0.55]	0.000*
Stage: Unit Four	0.49	0.09	[0.31, 0.67]	0.000*
Age	0.00	0.01	[-0.01, 0.02]	0.642
Major: Economics	0.30	0.15	[0.00, 0.60]	0.047*
Major: Sports, Hospitality, Tourism & Events Management	-0.05	0.09	[-0.24, 0.13]	0.572
Major: Human Resources	-0.12	0.10	[-0.31, 0.07]	0.215
Major: Management	0.04	0.10	[-0.16, 0.25]	0.674
Major: Marketing	0.05	0.08	[0-.12, 0.21]	0.581
Major: Other	-0.16	0.10	[-0.36, 0.04]	0.120
Life spheres: family	0.11	0.09	[-0.06, 0.28]	0.186
Life spheres: personal leisure	-0.07	0.09	[-0.25, 0.11]	0.449
Life spheres: professional associations	0.19	0.09	[0.01, 0.37]	0.038*
Life spheres: community activities	0.10	0.06	[-0.02, 0.22]	0.111
Working status	0.01	0.00	[0.00, 0.01]	0.007*
Work experience: trainee	-0.29	0.12	[-0.52, -0.06]	0.012*
Work experience: autonomous	0.31	0.12	[0.08, 0.55]	0.010*
Work experience: Supervisor	0.36	0.14	[0.08, 0.65]	0.013*
Importance of skill development	0.14	0.03	[0.08, 0.20]	0.000*
Quality of skill development	0.22	0.02	[0.18, 0.27]	0.000*
Constant	4.47	0.28	[3.92, 5.02]	0.000*

$R^2 = 0.31$ ;  $SEE = 0.92$ ,  $n=994$

**Table 3** Joint test results of dummy variable regression coefficients

Variable	$R^2$		F change	Significance F change
	Restricted model	Original model		
Continent	0.26	0.31	21.64	0.000*
Stage of degree	0.29	0.31	10.52	0.000*
Major	0.30	0.31	1.50	0.174
Life spheres	0.30	0.31	2.81	0.024



**Figure 1 Model of employability skill competence in undergraduates**