

## **Can graduate attributes be taught and not simply embedded in the curriculum? An evaluation of stakeholder perspectives and implications for graduate employability**

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### **Abstract**

**Purpose:** The aims of this research are to examine stakeholder perspectives of the use and usefulness of graduate attributes which are embedded into the curriculum of a UK university and to evaluate the potential of these graduate attributes to go beyond institutional pedagogy and enhance the employability skills set of graduates.

**Design/methodology/approach:** The research used a mixed method to elicit perspectives of a University's graduate attributes, interviewing employers and surveying students using a self-assessment tool and convenience sampling approach.

**Findings:** The research found that there are key attributes for the success of University-led graduate attributes which include engagement from stakeholders with those attributes,

commitment from teaching staff towards the development of identified attributes, appropriate time to align and embed attributes into the curriculum and with the needs of stakeholders and a framework which compliments institutional research and is properly resourced (Al-Mahood and Gruba, 2007). No one graduate attribute works in isolation, they have to be part of a measured and balanced model or framework to address the multi-faceted nature of graduate employability. The research reveals that work-based initiatives were the most valued by graduates and employers alike, which are arguably easier to teach as it is learning by doing as opposed to developing generic softer skills which are not valued highly by graduates in respect to employment. The findings support existing research that graduates value graduate attributes which involve work based learning activities as a means to gain employability skills and employment.

Practical and social implications: The research findings should provide Universities and Colleges from both within and out with the UK with a blueprint from which to create or refresh existing University led graduate attributes.

Originality/value: The findings from this paper consolidate existing research in the area of graduate employability and take research forward in the areas of graduate attributes, the measurement of these attributes and their currency in terms of employability and employer synergy.

Key words: Self-assessment tool; graduate attributes; employability.

## **Introduction**

When seeking to identify what employers want from a graduate one issue for employers is establishing knowledge of what their employees do and what they need to know to do that role. It is clear that for many employers articulating this knowledge and applying it in recruitment practice is limited by a lack of understanding of graduate attributes and how these are developed through a higher education taught course. The educational experience and attributes developed through Higher Education study could be expected to align with this praxis for employers (employability), although this raises a number of questions that need to be addressed. For example, does the educational experience 'teach' these attributes, develop them or facilitate them? What is the role of Higher Education in providing for employability? Even if we know what attributes employers value, are there issues with how these are taught, what is developed and what is nurtured? Can we realistically measure some

or any of these attributes to any useful end for each student or can these attributed only remain as generic statements? This paper investigates the aspects of practice, and reflexively considers what employers want in relation to their expectations of 'typical' attributes – and how students develop their attributes to provide some understanding on how students know what they know in (and through) practice in developing their attributes for employment in the current context where universities identify the acquisition of attributes as a part of the uniqueness of the student experience. The present study investigates the tacit and embodied aspects of educational practice in providing a curriculum that has embedded attribute development. Specifically, it investigates the taken-for-granted accounts of the student experience undertaking different pedagogical approaches to prepare for graduate employment. This paper presents a deeper understanding of graduate attributes examining how the attributes align between the curriculum, the student experience and employer expectations.

Whilst there is evidence of research into employer requirements when preparing curricula there are indications that employers are providing ambiguous expectations to educators. For example, Wellman (2010) revealed that for marketing graduates the employability attributes expected through the actual recruitment process showed that only under half of employers demanded a degree and less than a quarter a marketing one. This study raises questions about the value employers actually place on the attainment of a degree based on their recruitment decisions. In addition, the analysis also identified a wide range of 52 attributes, within 16 clusters, including communications, interpersonal relationships, information and communications technology, planning, self-management, decision making and problem solving and 22 personal traits, including creativity, responsibility, initiative, determination and confidence being commonly required. These issues indicate the nature of the problem for educators in relation to identifying how to meet employer expectations given their actions and the breadth of requirement through a curriculum designed with the need to compromise and meet different stakeholder expectations, including those of the students and quality assurance in addition to employers. Therefore, the first problem is identifying, reliably, exactly what employers want to inform curriculum design.

There is also an argument that Higher Education needs to retrieve the traditional civic role of the university so that universities are “of” the community and developing graduates as citizens (Mason O’Connor, Lynch and Owen, 2011). This ideological expectation appears in

various attributes for universities, but is a somewhat ambiguous issue when there is clear evidence that strategies are aligned with international and business objectives rather than as a social good.

Studies investigating how well the graduate attributes on which curricula are based match those required by employers have been limited (Debus and Lawley, 2009). Crebert et al. (2004) found that the literature consistently identifies employers' stated needs for graduates to be confident communicators, good team players, critical thinkers, problem solvers and, to be adaptive, adaptable and transformative people capable of initiating as well as responding to change. Our study therefore began by examining the currency of the Abertay graduate attributes with employer expectations for reliability and consistency given that the original attributes of 2007 had been extensively reviewed and revised during 2013/14 and implemented during 2015/16. If employers identify what they value and universities are committed to developing society and economic impact through more employable students we need to be able to determine "how" the development of these characteristics are "facilitated" (if not taught) and assessed; otherwise, it'll be a result of chance.

### **Can Graduate Attributes be Taught?**

Having identified a set of attributes specific to the Abertay context and conducted a review of their currency for reliability with a sample of employers that engage with student placements or employing graduates the question of what the curriculum can actually deliver then needs to be addressed. It could be argued that some generic skills and abilities (for example, communication skills, problem solving, analysis, critical thinking and teamwork) lend themselves to development at university, provided students are made aware of their importance, and are given opportunities to practise them throughout their degree programs and in an authentic workplace setting.

A specific issue within the design of undergraduate degrees is to ascertain the extent to which the taught curriculum can actually include and embed various attributes such as 'professionalism'. There are a number of questions that can be raised, including, which aspects of professionalism can be taught as opposed to developed, which aspects may be altered through teaching, reflective practice and assessment and what is the influence of extra-curricular opportunities in developing professionalism?. In addition, with many

Universities realising the benefits of vocational degrees and the importance of employability, the increasing inclusion of work-based learning and different placement models are also identifiable as curriculum developments intended as a part of achieving the employability attributes articulated by universities (Nottingham, 2016).

In identifying attributes during any university process the question of whether the attributes can be taught does not appear to be part of the process of identifying and articulating the attributes. In addition, identifying generic attributes that can be incorporated within curriculum design is limited where these remain tacit (Jones, 2009a). There is also the matter of the appropriate methodology for developing attributes such as leadership, entrepreneurial skills, assuming responsibility and making decisions, and demonstrating ethical standards. Some attributes are more appropriately developed in the workplace, either during work placement or in an employment situation, than at university. A curriculum that is inclusive of work placements could be argued as providing the necessary basis from which students can develop their attributes effectively to transition smoothly to the workplace.

Collier (2012) examined whether professionalism can be taught in the medical profession and identified that some topics of professionalism can be taught such as ethical codes governing conduct. During the study a particular issue in relation to the context was identified indicating that some elements are not readily teachable and if teachable, cannot readily be assessed equitably. For example, some attributes such as leadership can be taught and assessed but how can degrees of benevolence, compassion and ethical practice be measured equitably and consistently? It could be argued that the focus of attention may be only on those attributes that can be measured readily rather than dealing with the complexities of equally valuable attributes for which measurement is more complex, if indeed possible at all. Collier's study identified that in dealing with social media within a professional context that 60% of 78 medical schools reported unprofessional on-line behaviour by students with the most frequent issues being profanity (52%), discriminatory language (48%), depictions of intoxication (39%) and sexually suggestive material (38%). In relation to the complexity of the teaching of professional attributes, Abate (2010) concluded that engineering ethics cannot be taught if we understand "teaching engineering ethics" to mean training engineers to be moral individuals but that there is a justification to teaching engineering ethics insofar as identifying the most desirable and efficacious pedagogical approach to the subject area.

Curriculum design may require an extensive breadth of content for attribute achievement beyond initial expectations and the course framework permitted. In relation to professionalism, for example, additional content may be required to cover management of digital media and social networking sites to ensure reputation and standards are visibly maintained. Not only does this add pressure to the volume of content for any course and result in compromise on what may then have to be excluded but in more general terms the question of whether addressing such a topic within curriculum design can be interpreted as a form of censorship and control. Ultimately it is for each curriculum design team to reflect on such matters taking into account the current context and exercising appropriate judgement. It is with regards the issue of judgement where it could be argued that some curriculum design teams are not appropriately qualified or skilled enough to find a balance in content, which could put students at some institutions at a disadvantage in contrast to others.

Given the complexity of the content for curriculum design each discipline should be responsible for designing, implementing and assessing graduate attributes so as to produce marketable graduates (Herok et al., 2013). Jones (2009b) found that skills such as critical thinking, analysis, problem solving and communication are conceptualised and taught in quite different ways in different disciplines. It follows, therefore, that graduate attributes have to be realistic in terms of their ability to be taught and assessed and ambiguous statements such as “demonstrates a willingness to be a ‘lifelong learner’”, which cannot be validated until the end of a graduate’s working life, would be inappropriate if the intention is to articulate meaningful statements. As well as avoiding spurious statements for attributes when it comes to an attribute involving values, the educators have the power to get students to become conscious of their values and help them identify and develop the skills needed to reflect on them; however, the educator must first acquire the same skills (Sutrop, 2015). Notwithstanding the issues there is evidence that aspects of character and attributes can be taught showing that there is a measurable impact (Schwartz, 2007) and that the integration of attributes with disciplinary epistemology (Jones 2009b) enable the positive development of attributes. For the purposes of curriculum design and teaching practice it is appropriate to identify the limitations of what can be achieved in practice.

There is evidence that the alignment of an attribute such as entrepreneurship with teaching practice might not be reliable (Klein, 2006). Klein investigated the major approaches to teaching entrepreneurship at undergraduate level and found little connection between the

leading approaches to entrepreneurship education and economists' understanding of the entrepreneurial function. Further, the matter of the subject being partly science based and partly art also has an influence on teaching. Henry and Treanor (2012) discuss the difficulties in teaching entrepreneurship where educators have to cover both the "science" and the "art" elements and identify that there is value of entrepreneurship education as a key enhancer of employable skills, regardless of the discipline area. Whilst the functional business and management skills considered the science element can be taught using a conventional pedagogical approach the art element capturing the more creative and innovative attributes of entrepreneurship are more of a challenge for both educators and students (Henry and Treanor, 2012).

Irrespective of what an educator believes can, or cannot be taught, there is evidence (Yaeger and Dweck, 2012) that educators can influence student development. The Yaeger and Dweck study involving students studying mathematics showed that students who believe that qualities can be developed (as opposed to qualities that are fixed), using approaches to change mindsets, demonstrated higher achievement across challenging school transitions and greater course completion rates. The study confirms that it is possible for the educators, within an appropriate curriculum design, to change and foster mindsets effectively to create resilience.

The incorporation of generic attributes within curriculum design is also complex while attributes such as critical thinking, problem solving and communication are valued by teaching staff they are often implicit in teaching (Jones, 2009a). Jones (2009a) identified that the gap between what is valued and what is actually taught is a result of variation in interpretation of generic attributes, the difficulties of reducing complex attributes to definable learning outcomes and practical constraints on teaching caused by factors such as large classes.

Al-Mahmood and Gruba (2007) examined three different models of delivery in Australian universities for generic graduate attributes, these models being dedicated, infused and embedded within the context of the ICT subject. Al-Mahmood and Gruba (2007) identified that, irrespective of model, that there were common elements for success and these included, engagement with attributes and commitment by the delivery team towards their development, realistic time for the curriculum to be aligned with influence of attributes, adequate resources

and the research agenda has also to be encouraged to build upon both discipline and graduate attribute knowledge.

Curriculum design in relation to achieving attributes has been an issue for some years with Barrie (2006) identifying issues within the Australian Higher Education sector that has been engaging with the concept of graduate attributes for longer than the UK. It is evident that the UK is not alone in struggling to identify what combination of skills, attributes and knowledge to include in these statements of graduate outcomes and resolving how to develop curricula to effectively achieve these outcomes. Barrie (2007) investigated academic conceptions of generic attributes and found that academics hold a variety of disparate understandings of the nature of generic attributes and their place amongst the outcomes of a university education. Barrie (2007) proposed a model for implementing curriculum reform in universities:

Approach I: Additive outcomes taught in a teacher-focused way in a supplementary curriculum

1. Generic attributes are basic prerequisite skills which students should already possess; they are only taught in remedial classes at university. (A:1)
2. Generic graduate attributes are skills and abilities that can complement, but not modify, disciplinary knowledge and are taught to all students as an unrelated add-on to the existing curriculum. (B:2)

Approach II: Transformative outcomes taught in a teacher-focused way in an integrated curriculum

3. Generic graduate attributes make disciplinary knowledge relevant and are taught as part of discipline content. (C:3)
4. Generic graduate attributes make disciplinary knowledge relevant and are taught through the process of teaching discipline content. (C:4)

Approach III: Transformative outcomes taught in a learner-focused way in an integrated curriculum

5. Generic graduate attributes make disciplinary knowledge relevant and are learnt through the way students engage with the course. (C:5)
6. Generic attributes are complex abilities that infuse learning and knowledge and are learnt through the way students engage with the course. (D:5)
7. Generic attributes are complex abilities that infuse learning and knowledge and are learnt through the way students engage with university. (D:6)



Barrie (2007) found that the most complex integrated conception (D:6) presented a particular challenge for generic attributes curriculum reform initiatives. Generic attributes are understood to be interwoven aptitudes and abilities, such as academic inquiry and intellectual curiosity, the ability to accommodate diversity and alternative perspectives, the ability to create and defend ideas, and the ability to use communication as a vehicle for learning. Barrie (2007) explains that while such outcomes might sit at the heart of formal scholarship and university courses (as in the D:5 conception), the processes by which students might develop such abilities can also be far broader than the familiar academic classroom learning environment presenting the question of how universities might help students achieve the attributes through engagement with other facets of university life outside of their formal classes.

Teamwork skills are a core attribute and expectation for the workplace and during studies, but the generic nature of this title does not convey the complexity of how it needs to be rigorously covered within curriculum design. Opatrny (2006) examined the question of whether or not the teaching of teamwork had an enduring impact on students' teamwork skills, supporting the conclusion that the meaningful teamwork skills that have a measurable impact can be taught. At face value there is encouragement to develop teamwork skills within curriculum design but in practice it is possible to identify a lack of alignment between what is taught and assessed and what is expected by employers. A primary issue relates to whether there is a team or group for the purposes of the student experience as many educators confuse the two terms in practice yet they are separate and distinct in operation and should be treated as such when it comes to teaching and assessment. In groups where people can be assigned individual tasks for a collective output it is possible to provide individual grades that align with the individual tasks that can be identified; for a team submission then collective responsibility and the same grade for each member would be the appropriate method in practice to reflect the teamwork philosophy. If the teaching practice is fundamentally flawed then it follows that how such an attribute is assessed, if at all, will be flawed and it appears that a single output is taken as a proxy for teamwork skills without actually assessing the teamwork skills. The value of teamwork in work-based learning in preparation for employment is recognised (Crebert et al., 2004), particularly as this is where the importance of teamwork skills and being given and taking responsibility are realised more visibly within the student experience but it must be executed with an understanding of all the teamwork skills, attributes and objectives that the exercise is to let the students develop and achieve.

The problems of applying the same grade for all team-members is recognised by educators, yet in the workplace a fact that does not raise the same discussion of equity when results are reviewed. In addition, the output of any group or teamwork assessment is typically subject content, although there may be an element to allow for reflection, but exactly how can the intangible and unseen skills developed for a teamwork attribute of an individual through completing the assessment of, for example, collaboration, negotiation, empathy and listening to others be equitably and consistently assessed in a transparent way? Teaching staff are creative and can find solutions to these problems, such as creating a single total grade that can be divided and apportioned across the team by the team to reflect individual contributions/effort that might not be recognised within the output (although this requires clear procedures for disputes). In terms of equality of student experience this approach to practice raises the question, “To what extent should such solutions be left to the discretion of teaching staff?” From a management perspective there is no doubt that there would be preference for a more ‘institutionalised’ approach with guidelines that ensure transparency and consistency.

### **Can Graduate Attributes be Measured?**

If graduate attributes are to have any meaning and substance then it follows that there is an obligation to rationally and explicitly show how and where the curriculum develops, facilitates and assesses these attributes (Shannon, 2012). The issues surrounding identification and alignment of attributes with employer expectations to inform curriculum design have been discussed but the question of evidencing the achievements still has to be addressed. The importance of evidencing the achievement of attributes is receiving increasing recognition and the start of the trend was commented upon by Hughes and Barrie (2010) from the Australian perspective and identifying national projects resulting in resource materials. Hughes and Barrie (2010) found that alignment between learning outcomes and assessment needed to acknowledge other factors to be effective. The eight inter-related factors determining the effectiveness of the implementation of graduate attributes were:

- Conceptualisation
- Stakeholders
- Implementation strategy
- Curriculum approach
- Assessment

- Staff development
- Quality assurance
- Student-centredness

Providing evidence in the forms of mapping documents has an important role in providing quality assurance and reporting processes transparency to demonstrate alignment between the espoused curriculum and the taught curriculum. The question of how well aligned the stated curriculum with the enacted curriculum was examined by Bath et al. (2007) at one Australian institution by engaging in a process of action learning to create a valid and living curriculum for the development of graduate attributes. The study confirmed that there were benefits to measuring the development of graduate attributes in students and that this can be a simple self-assessment process. Whilst not an objective measure Bath et al. (2007) argue that there is potential for demonstrating the development of generic skills that are difficult to assess with other approaches.

Employers identify innovation, adaptability and flexibility as generic, transferable skills and attributes and are accepted as a proxy of an employee's employability and work readiness (Coatzee, 2014). How are these attributes to be articulated? These qualities of personal growth and intellectual development as a product of a specific higher education experience and the relevance of the attributes in the workplace if they are to be measured, need to be measured reliably. Problems of implementing the graduate skills and attributes agenda in higher education are generally attributed to the lack of a clear theoretical foundation and how these skills and attributes should be taught, assessed, measured and evaluated within a specific disciplinary context (Green et al., 2009).

### **The Effectiveness of Self-Assessment Tools**

Markus et al. (2005) examined the origins, development and the claimed benefits of implementing competency models and their application in a sample of New Zealand organisations. Markus et al. (2005) questioned the gap between claims made for individual performance improvement and the benefits measurably delivered. One of Markus' et al. (2007) concerns was the considerable administrative burden; raising the question for anyone considering this approach, "Can the investment in administration be justified?" Markus et al.

(2007) argued that the current lack of validation studies means that the actual benefits of such models are unknown to a degree.

Heijke et al. (2003) investigated the role of three different types of competencies in the labour market for higher education graduates, distinguishing between discipline specific competence, general academic competence and management competence. The study involved Italian higher education graduates interviewed three years after graduation. The Heijke et al. (2003) study supports the grouping of competencies into categories crucial for managerial leaders. The Heijke et al. (2003) confirm that the level of discipline-specific competences obtained in higher education offers a comparative advantage for graduates working inside their own discipline-specific domain, and therefore has a pay-off for those graduates who are able to find a job in the discipline studied. The study also found that more generic management competences are valued in the labour market but seem to be acquired more successfully in a working context than in higher education.

Deshpande and Farley (2004, p6) state that, “self-reporting is not an ideal solution to measuring performance, but it seems the most workable”. Simons et al. (2002, p292) undertook a study of 1,453 psychological tests over a 3 year period to investigate the error rates resulting from hand scoring seven types of psychometric tests, “commonly employed in psychological practice”. The study by Simons et al. (2002) found that during self-scoring 9.3% resulted in an ‘incorrect profile’ as opposed to 2.5% when scored by a professional psychologist. Whilst this raises concerns about the reliability surrounding the design and implementation of a self-evaluation tool for graduate attributes the study acknowledged that no information on the instruction to participants was available and there was no indication of how much time the participants were given. With sufficient instruction and guidance and the use of spreadsheets the issues of arithmetic and transposition errors can be reduced to smaller figures than Simons et al. (2002) reported.

Based on the evidence above it is possible to deduce that whilst there may be reasons for questioning the accuracy of such approaches the acceptability of these models in practice as a method for assisting in the process of reflection and development would indicate that the benefits outweigh the limitations. Lawson et al. (2012) provide compelling evidence that self-assessment, whilst it does have some limitations, can make valid judgements of their performance in relation to graduate attributes.

## **A Self-Assessment Methodology for Measuring Graduate Attribute Development**

Our project team started by identifying a number of employers for the planned workshop to assist in reviewing the Abertay Attributes in relation to their current expectations and needs of workplace attributes. 27 people were contacted directly in representing their organisations, some with the request to include specific additional contacts. Following this event the team set up interviews with those that could not attend the workshop event and created the metrics from the inputs. This tool was piloted with those that attended the workshop or participated in the follow-up interviews.

### ***Aims, Objectives and output of employer focus group***

Graduate Attributes are sensitive to their surroundings, the culture, and the values of the institution (Green et al., 2009), for which Abertay University created Abertay Attributes. The employer focus group examined what Abertay Attributes mean in practice to local and national employers, including what behaviours, or actions could be considered evidence of attribute development?

This action research project (Reason & Bradbury, 2013) develops, with employers and key Scottish skills councils, a survey based tool to capture and assess Abertay Attribute development. This section covers the employer-engagement group of the research. What do employers want our graduates to be like? The action thinking interventions addressed:

1. The perfect graduate vs the actual employee (Table 1)
2. The behaviours and traits of ideal graduates (later categorized into the FOUR Abertay Attributes)
3. The top table: Ranking of key criteria (Abertay Attributes)
4. Conversion of focus group (employer) needs into 'statements of practice'
5. Circulation of results for review, editing, and development.

The team then operationalized the Abertay Attribute principles into behaviors, beliefs and actions. Through the use of action learning sets the team converted the principles of Abertay

Attributes into measurable criteria, and produced a survey instrument in preparation for the pilot testing of an Abertay Attribute survey tool.

**Table 1 Focus group results: The perfect graduate vs the actual employee**

<b>What employers want:</b>	<b>What doesn't HE teach students?</b>
<ul style="list-style-type: none"> <li>• Qualifications / knowledge of subject</li> <li>• Understanding of 'how to learn', 'how to research', and 'how to study'</li> <li>• Graduate competencies: more than knowing what, knowing how and why.</li> <li>• Ready for professional training, can be trained easily without restarting everything...</li> <li>• Potential for management / leadership and have the appropriate skills and attitude</li> <li>• Shows the evidence that employer-university engagement is producing the right graduate</li> <li>• Brings new ideas and innovation into business</li> <li>• Hit the ground running</li> <li>• Good IT / technical / Business skills</li> <li>• Level of maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Communication skills (personal, face-to-face, telephone, non-verbal skills)</li> <li>• Create a sense of confidence (self-belief, ambition and drive)</li> <li>• Understanding and awareness of uncertainty (how to cope outside comfort zone)</li> <li>• Responsibility (taking responsibility and being accountable)</li> <li>• Presentation and critical thinking / persuasion / selling skills</li> <li>• Initiative (need to be more creative and active)</li> <li>• Reflective or enquiring minds (why, why, why, how, how, how???)</li> <li>• More knowledge about the subject and technical basics.</li> </ul>

***The behaviours and traits of ideal graduates (later categorized into the FOUR Abertay Attributes)***

The employer focus group was mixed up to encourage creativity, and invited to brainstorm expected behaviours of the graduates they perceived as ideal (diagram 1). The ideas were then 'ranked'. The group produced four key categories of a 'graduate as person' which in their ranked order are: Integrity / reliability; good behaviour; communications and social

skills; resource / thinker (Table 2). Similar tasks were carried out to produce results for academic attributes (Table 3), citizenship and professional.

**Diagram 1: Graduate behaviours**



**Table 2: Personal Attributes**

Integrity / reliability	Good behaviour	Communications and social skills	Resource / thinker
Trustworthy	Confident	Good listener	Creative
Reliable	Pleasant	Good speaker	Interested
Honest	Team player	Clear thinker	Adaptable

Integrity	Friendly Cheerful Approachable On Time Networker Motivated Enthusiastic Polite	Focused  Presents well  Conveys clearly	Curious
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**Table 3: Academic - ranked into FIVE levels of importance (qualification/experience highest)**

1	2	3	4	5
Qualification Knowledge & Experience	Professional awareness Common sense Soft skills Time management Project management Written and oral presentation skills	Problem solving  Ability to evaluate  Ability to learn  Understanding competencies Confidence	Theory and practice Language skills Emotional intelligence Analytical awareness of SWOT	Continuous development Social intelligence

From the citizenship activity the participants identified the following characteristics they interpreted as displaying citizenship: outward looking, empathetic, outside interests, caring, committed to equality, think about consequences of decisions / future looking, active with groups, listener, professionally involved, broad awareness, learn about community, considerate, inclusive, global outlook / awareness and tolerant.

From the professionalism activity the participants identified the following characteristics: truthful, highly knowledgeable, positive first impression, positive attitude, articulate /



effective articulation skills, intuitive, confident, respectful / respected, high integrity, ethical, ambitious, approachable, responsible, committed, attention to detail and understand own limits.

The ‘words’ used by employers and careers advisors are typical words that mean something to those in these positions. These are not the same words as used by graduates / students but are in a form that is transferable between these population types. Often words and characteristics are almost universal such as honest, integrity, confidence, effective communicator and listener. Although leadership was not listed in the employer focus group it was mentioned within the interviews and were included in the mapping exercise to develop the questionnaire (Table 4) and appear as the questions in tables 5, 6, 7 and 8 without numbers.

**Table 4: Questionnaire developed from employer focus group**

<b>Personal Attributes</b>	<b>Academic</b>
1. I would consider myself trustworthy	1. I have worked hard to achieve the highest level of knowledge in my subject
2. Others would see me trustworthy	
3. I know my personal limits	
4. I ensure I deliver what I promise.	2. I understand that I need to do the work required to meet the gap between my current level of knowledge in my field and where I could be.
5. People who know me would consider me reliable	
6. I am always honest with people when dealing with difficult issues	3. I actively look for opportunities to extend my thinking through contact and application with industry.
7. I believe honesty is important when interacting with others	
8. I am clear about my own values and live by them rigorously	4. I know how to evidence my subject knowledge in practice.
9. People consider me to be reliable	5. I manage my learning through planned use of time and resources.
10. I work in teams effectively	
11. People would call me friendly and approachable	6. I am creative in identifying solutions to problems.
12. I am polite to others.	
13. I am a good listener.	

<p>14. I am a good speaker</p> <p>15. I am motivated and enthusiastic when dealing with people and problems.</p> <p>16. I am usually on time for meetings</p> <p>17. I can present my thoughts clearly to others</p> <p>18. I can work very focused on a given task</p>	<p>7. I can identify, collect and analyse information without direction from others.</p> <p>8. I can speak another language well</p> <p>9. I use a plan for my personal development</p> <p>10. I use my social skills to improve relationships with others.</p> <p>11. I can work independently</p> <p>12. I continuously look for opportunities to enhance my skills</p> <p>13. People think I am a good problem solver</p> <p>14. I know how to learn a subject</p> <p>15. I prefer to analyse issues rather than describe them</p> <p>16. I know how to translate my academic knowledge into what an employer wants</p> <p>17. I can objectively evaluate my performance</p> <p>18. I know what employers want</p>
<p><b>Active Citizenship</b></p> <p>1. I engage with my local community in social, welfare or charity activities.</p> <p>2. I like to meet and work with new and interesting people outside my university friends.</p> <p>3. I am sensitive to the needs of people less fortunate than myself.</p> <p>4. I have many friends outside the university</p> <p>5. I like to include a diverse range of people in my activities</p> <p>6. I feel comfortable organizing events.</p>	<p><b>Professional</b></p> <p>1. I am very knowledgeable about my field of study</p> <p>2. I work hard to create a positive impression</p> <p>3. I practice my communication skills by engaging in conversation with other professionals.</p> <p>4. I treat others with respect</p> <p>5. I value the skills of others.</p> <p>6. I normally have a plan to ensure success and work hard to achieve this.</p>

7. I feel comfortable having responsibility for events	7. I understand that attention to detail is important
8. I have friends outside my ethnic group and	8. I can hold an intelligent conversation with a wide range of people on community, business and personal issues
9. I actively engage with a diverse peer group	9. I take personal responsibility for the work I produce.
10. I am aware of global issues and how they affect my community	10. It is important that I understand my own limits to improve my skills.
11. I am tolerant of different opinions	11. I am ethical in all my dealing with others.
12. I can voice my own opinion without offending others.	12. I am ambitious for myself
13. I listen to others and seek understanding without criticism	13. I can instil ambition in my colleagues
14. I try to consider the implications of my actions carefully.	14. People tell me I am a responsible person
15. I am aware of the consequences of my actions	15. People have remarked positively on my personal integrity
16. People have told me that I have a caring nature	16. I have a positive attitude to the work I am undertaking
17. I am aware of what is going on in the world	17. I have good presentation skills
18. I can empathise with other's feelings	18. In my dealings with others I try to be as honest as possible

Subsequently the attribute self-assessment tool was designed with a questionnaire. An extract of the pattern matrix, which lists the factors and the loadings of the survey item on each factor (component) is presented in Table 5 Academic, Table 6 Personal, Table 7 Active Citizen and Table 8 Professional. The higher the loadings, the more a survey item is associated with or representative of that particular factor. Factor/component 1 could be described as 'academic', factor 2 as 'professional', factor 3 as 'citizenship', and factor 4 as 'personal'.

**Table 5: Academic Pattern Matrix<sup>a</sup>**

	Component			
	1	2	3	4
(Acad 1) I have worked hard to achieve the highest level of knowledge in my subject	.376	-.018	-.056	.393
(Acad 2) I understand that I need to do the work required to meet the gap between my current level of knowledge in my field and where I could be.	.185	.127	.106	.512
(Acad 3) I actively look for opportunities to extend my thinking through contact and application with industry.	.499	-.190	.226	.342
(Acad 4) I know how to evidence my subject knowledge in practice	.452	-.083	-.106	.301
(Acad 5) I manage my learning through planned use of time and resources	.428	.004	.061	.358
(Acad 6) I am creative in identifying solutions to problems	.580	.001	-.060	.288
(Acad 7) I can identify, collect and analyse information without direction from others.	.471	.079	.000	.393
(Acad 8) I can speak another language well	.670	.148	-.289	.006
(Acad 9) I use a plan for my personal development	.664	-.017	.014	-.141
(Acad 10) I use my social skills to improve relationships with others	.273	.061	-.079	.341
(Acad 11) I can work independently	.175	.349	.109	.329
(Acad 12) I continuously look for opportunities to enhance my skills	.784	-.085	.174	-.028
(Acad 13) People think I am a good problem solver	.615	.064	.062	.134
(Acad 14) I know how to learn a subject	.367	.222	-.083	.427
(Acad 15) I prefer to analyse issues rather than describe them	.339	.322	.124	.164
(Acad 16) I know how to translate my academic knowledge into what an employer wants	.505	.148	.180	-.238

(Acad 17) I can objectively evaluate my performance	.725	-.055	.245	-.080
(Acad 18) I know what employers want	.282	-.516	.597	.014
I can hold an intelligent conversation with a wide range of people on community, business and personal issues. (Acad)	.122	.185	.473	.126

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 14 iterations.

**Table 6: Personal Pattern Matrix**

	Component			
	1	2	3	4
(Pers 1) I would consider myself trustworthy	-.338	.087	.632	.320
(Pers 2) Others would see me trustworthy	-.162	.001	.640	.412
(Pers 3) I know my personal limits	.000	-.149	.268	.607
(Pers 4) I ensure I deliver what I promise	.027	.129	.264	.581
(Pers 5) People who know me would consider me reliable	-.116	.102	-.097	.419
(Pers 6) I am always honest with people when dealing with difficult issues	-.163	.318	.055	.333
(Pers 7) I believe honesty is important when interacting with others	-.228	.535	.286	.107
(Pers 8) I am clear about my own values and live by them rigorously	-.045	.363	.019	.495
(Pers 9) People consider me to be reliable	.106	-.053	.097	.491
(Pers 10) I work in teams effectively	-.084	.281	.014	.475
(Pers 11) People would call me friendly and approachable	-.426	.569	.280	.130
I tend to reflect on how I do things (Pers)	.393	.518	-.039	-.338
I am confident in my ability to be successful (Pers)	.310	.367	.067	.096
(Pers 12) I am polite to others	-.401	.316	.588	-.041
(Pers 13) I am a good listener	-.362	.230	.465	.294
(Pers 14) I am a good speaker	.273	.443	-.125	.274

(Pers 15) I am enthusiastic when dealing with problems	.407	.238	-.002	.168
I am prepared to take responsibility and lead if the situation requires it. (Pers)	.248	.610	.033	-.030
(Pers 16) I am usually on time for meetings	.004	-.211	.348	.626
(Pers 17) I can present my thoughts clearly to others	.119	.348	.029	.556
(Pers 18) I can work very focused on a given task	.464	.122	.052	.362

**Table 7: Citizenship Pattern Matrix**

	Component			
	1	2	3	4
(Citiz 1) I engage with my local community in social, welfare or charity activities.	.492	-.043	-.090	-.021
(Citiz 2) I like to meet and work with new and interesting people outside my university friends.	.324	.145	.091	-.085
(Citiz 3) I am sensitive to the needs of people less fortunate than myself.	.278	.197	.238	-.346
(Citiz 4) I have many friends outside the university	.003	-.118	.422	.270
(Citiz 5) I like to include a diverse range of people in my activities	.381	.108	.313	-.174
(Citiz 6) I feel comfortable organizing events.	.512	.448	-.137	.106
(Citiz 7) I feel comfortable having responsibility for events	.474	.407	-.203	.120
(Citiz 8) I have friends outside my ethnic group	.122	.394	-.165	.267
(Citiz 9) I actively engage with a diverse peer group	.385	.159	.084	.113
I can be trusted and relied on to do the job to the best of my abilities (Citiz)	.312	.160	.236	-.027
(Citiz 10) I am aware of global issues and how they affect my community	.495	-.415	.595	-.067
(Citiz 11) I am tolerant of different opinions	.155	.138	.623	-.519
(Citiz 12) I can voice my own opinion without offending others.	.027	-.182	.680	.110

(Citiz 13) I listen to others and seek understanding without criticism	-.078	.175	.775	.002
(Citiz 14) I try to consider the implications of my actions carefully.	.340	.090	.597	-.070
(Citiz 15) I am aware of the consequences of my actions	.160	-.031	.648	.075
(Citiz 16) People have told me that I have a caring nature	.159	.234	.594	-.345
(Citiz 17) I am aware of what is going on in the world	.216	-.248	.540	.115
(Citiz 18) I can empathise with other's feelings	-.027	.322	.313	-.581

**Table 8: Professional Pattern Matrix**

	Component			
	1	2	3	4
(Prof 1) I am very knowledgeable about my field of study	.429	.328	.055	-.017
(Prof 2) I work hard to create a positive impression	.037	.618	.115	.053
(Prof 3) I practice my communication skills by engaging in conversation with other professionals.	.317	.406	.066	.187
(Prof 4) I treat others with respect	-.336	.550	.402	-.001
(Prof 5) I value the skills of others.	-.113	.296	.431	.027
(Prof 6) I normally have a plan to ensure success and work hard to achieve this.	.335	.158	.235	.084
(Prof 7) I understand that attention to detail is important	.327	.230	.043	.017
(Prof 8) I can hold an intelligent conversation with a wide range of people on community, business and personal issues	.245	.061	.529	-.093
(Prof 9) I take personal responsibility for the work I produce.	.134	.377	.373	.155
(Prof 10) It is important that I understand my own limits to improve my skills.	.181	.421	.132	.032
(Prof 11) I am ethical in all my dealing with others	.055	.322	.322	.024
I am confident in my relationships with colleagues (Prof)	.245	-.227	.599	.244
(Prof 12) I am ambitious for myself	.059	.851	-.336	.033
(Prof 13) I can instil ambition in my colleagues	.200	.714	-.183	-.094

(Prof 14) People tell me I am a responsible person	.159	.551	-.147	.136
(Prof 15) People have remarked positively on my personal integrity	.248	.692	-.040	-.131
(Prof 16) I have a positive attitude to the work I am undertaking	.317	.289	.195	.153
(Prof 17) I have good presentation skills	.048	.621	.021	-.052
(Prof 18) In my dealings with others I try to be as honest as possible	.139	.553	.081	-.065

Based on the analysis the team can make some deductions regarding the survey which was conducted with 52 students. To determine the factor structure of the tool, a Principal Component Analysis (PCA), with oblique rotation was used. This technique was chosen because it allows us to explore possible factors, which we expect to be correlated.

To determine the number of factors, we used the following guidelines: eigenvalues higher than 1, scree plot. The first 4 factors have Eigenvalues of 22, 4.9, 4.3 and 3.85, respectively (the team's chosen cut-off point) and this is also where the Scree plot (a plot of Eigenvalues) levels off, another guideline. It has also been suggested in the statistical literature to go with all factors that have Eigenvalues > 1 but that is, in our view, not useful given that we have 21 of those. Thus, the team identified 4 factors within the model based on the Eigenvalues. The higher the Eigenvalue, the more variance is explained. The total variance explained with our model using these 4 factors is 45.8%. In relation to the factor loadings, i.e. how good each survey item is representative of the underlying factor, we retained items with a factor higher than 0.35 and if an item loaded on more than 1 factor it is a problematic item and needs to be re-written or removed.

Most items load highly on one factor only and not on the others, which means there is a good separation between the factors. There are a few (not many) items that load high on 2 factors. For example, the survey item citiz 6 "I feel comfortable organising events" loads .512 on factor 1 and .448 on factor 2. From what we can assert that factor 1 is more consistent with the 'academic' attribute, factor 2 is more consistent with the 'professional' attribute (though this specific item loads lower on factor 2). We speculated that this survey item is associated



with ‘active citizenship’, which is an entirely different attribute and the item only loads .106 on ‘active citizenship’. The results indicate the complexity in articulating transparently the development of a university’s unique attributes at individual level.

Examples for survey items that load high on the ‘academic’ attribute, are:

(Acad 12) I continuously look for opportunities to enhance my skills (.784)

(Acad 17) I can objectively evaluate my performance (.725)

(Acad 8) I can speak another language well (.670)

(Acad 9) I use a plan for my personal development (.664)

But also

(Citiz 6) I feel comfortable organizing events (.512)

Examples for survey items that load high on the ‘personal’ attribute, are:

(Pers 16) I am usually on time for meetings (.626)

(Pers 3) I know my personal limits (.607)

(Pers 4) I ensure I deliver what I promise (.581)

But also

(Acad 2) I understand that I need to do the work required to meet the gap between my current level of knowledge in my field and where I could be (.512)

Examples for survey items that load high on the ‘citizenship’ attribute, are:

(Citiz 13) I listen to others and seek understanding without criticism (.775)

(Citiz 12) I can voice my own opinion without offending others (.68)

(Citiz 15) I am aware of the consequences of my actions (.648)

But also

(Pers 1) I would consider myself trustworthy (.632)

Examples for survey items that load high on the ‘professional’ attribute, are:

(Prof 12) I am ambitious for myself (.851)

(Prof 13) I can instil ambition in my colleagues (.714)

(Prof 15) People have remarked positively on my personal integrity (.692)

But also

(Pers) I am prepared to take responsibility and lead if the situation requires it. (.610)

Based on inspection, there seem to be factors representative of 'academic', 'professional' and 'citizenship' attributes, consistent with how we labelled the survey items. The fourth one 'personal' is less clear cut, as it has fewer survey items that load highly on it (i.e. are associated with it). It could well be that a 3 factor (Attribute) model could provide a better fit, were it not for the fact that a number of survey items load highly on this 4th factor (between .5 and .63) and not with the other factors.

Overall the results are encouraging and means that our survey items map very well onto the factors (Attributes) we generally suspected. This also means we can go with the items that load the highest on each factor (Attribute) to specify the survey items for that factor. From this first survey the team need to re-examine the model as some of the items need to be redefined/investigated/removed. Again, that is perfectly acceptable as the model is refined and made more robust.

## **Conclusions**

The findings from this paper consolidate existing research in the area of graduate employability and take research forward in the areas of graduate attributes, the measurement of these attributes and their currency in terms of employability and employer synergy. There is sufficient evidence to indicate that a practical and reliable survey tool to measure attribute development at individual level can be designed and implemented. There is potential for this attribute self-assessment tool to be transferable to other institutions indicating the potential for all universities expressing 'graduateness' through attributes could make the development of these more individualistic and transparent. There is also evidence that demonstrates specific approaches to teaching and learning have an impact upon graduate-ness and attributes. The next step for the model is to re-validate with a much larger sample and then the impact of different teaching interventions can be more successfully evaluated. The team will then focus on teaching interventions comparing and contrasting the impact of simulated work experience, part-time work based experience and block-release full term work-based learning and the development of attributes.

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