The Robots are Coming! The response of careers professionals to the future of the graduate job

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The future of work, shaped by technology, threatens graduate jobs, even in traditional professions. So how do we equip students for their future, not the world we know? For 30 years, employer requirements and graduate roles have seen little variation, but reviews of key sources suggest a change has begun. Drawing upon current perspectives on the future of work, this article identifies challenges and opportunities for higher education careers professionals relating to the relevance of knowledge and practice. It also suggests that this futuristic landscape provides further opportunity to challenge a persistent binary divide between 'being academic' and 'being employable'.

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Introduction

Across higher education, careers professionals have been accustomed to a relatively steady graduate market with as much change within higher education itself. The term 'careers professional' is commonly used across the sector to describe a range of roles, differently configured by institution, covering responsibility for careers education, information, advice, guidance, employer engagement and the management of placements. Careers professionals are experts in helping students to identify their values, skills, knowledge and motivations, to identify the sectors or organisations in which they wish to develop their careers and to make successful applications. The focus on 'graduate level jobs' means students must be helped to understand the particular skills or attributes that employers are looking for. This endeavour has been assisted by a regular production of lists, often the result of surveys, usually in order of priority. A review of representative lists from 1988 to 2017 suggests that relatively little has changed over time.

The author is the proud owner of a carefully preserved cutting from a 1988 edition of the Sunday Times, shown to her then by her (slightly anxious) father, six months before she graduated in history and economics and, to her delight, presented by him to her when she took up her current post in Nottingham twenty five years later. Godfrey Golzen's 1988 article reported on moves taken by the then Council for National Academic Awards (CNAA) to explore and articulate the connection between 'humanities and employment'. Comparison with the list of skills sought by graduate employers within the Association of Graduate Recruiters' 2017 Development Survey suggests that while order and terms may have changed - for example, graduate job-seekers are now much more familiar with the concept of 'commercial awareness' - the qualities required now still resonate strongly with the Golzen article; what is the purpose of commercial awareness if not to contribute to informed decision-making? A review of the skills required by employers in the intervening years: CBI (1994), Bennett (2002), Edge Foundation/SCRE (2011), supports the suggestion that variation has been limited, even when uniquely articulated skills are highlighted. The Bennett (2002) list is derived from a survey of over 1000 graduate employers, published roughly at the mid-point between the Golzen article and the 2016 data collection for the AGR 2017 survey. All five lists are presented in figure 1 for comparison.

Figure 1: Articulations of skills sought by graduate recruiters 1988-2017
(uniquely articulated skills in bold)

Golzen (1988)	Bennett (2002) (alphabetical, not prioirity order)	The Edge Foundation/ SCRE (2011)
• Communication	• Adaptability/Flexibility	• Team working
• Motivation	• **Analysis**	• Problem solving
• Personal Qualities (application of ideas, persistence)	• Communication	• **Self-management**
• Interpersonal Skills (**tenacity**, teamwork)	• Initiative	• Knowledge of the business
• **Informed Decision Making**	• IT	• Literacy and numeracy relevant to the post
• **Management**	• Leadership	• ICT knowledge
	• Motivation	• Good interpersonal and communication skills
	• Numeracy	• Ability to use own initiative **but also to follow instructions**
	• **Organisation**	• Leadership skills where necessary
	• **Presentation**	
	• Problem Solving	
	• **Self-confidence**	
	• Teamworking	
CBI (1994)		**AGR (2017)**
• Personal and Interpersonal Skills		• **Negotiating/influencing**
• Communication		• Commercial Awareness
• Information Technology		• **Dealing with conflict**
• Application of Number		• **Self-Awareness**
• Problem Solving		• Business Communication
• **Modern Language Competencies**		• **Managing up**
		• Interpersonal Skills
		• Problem Solving
		• Teamwork
		• **Resiliency Skills**

Evolution not Revolution

Ongoing feedback from graduate recruiters indicates that the consistency of these lists reflects a graduate job market where change has been incremental, not dramatic. The introduction of technology within the workplace is apparent in the appearance of 'Information Technology' in 1994, 'IT' in 2002 and 'ICT' in 2011, and a disappearance by 2017, suggesting that such proficiency, perhaps not always rightly, is now assumed. Over this period, technology has primarily enabled recognisable graduate roles while the biggest transformations to jobs have been within technology-related roles themselves and in opportunities for start-up companies to fill new niches. Careers professionals have kept pace with these developments through research, experience and contact with employers, augmented by labour market reports. Market changes have reflected economic cycles, most recently the recessions as a result of the dot.com crash in the early 2000s and the 2008 financial crisis. There has also been sector evolution: the 'Big Six' accountancy firms are now the 'Big Four' financial services firms. No one is seeking to recruit entrepreneurial accountants, if ever they were, and there are now opportunities to be fast-tracked into client-facing public sector roles, for example teaching and social work. For students,

often bewildered by the range of job possibilities, the familiarity of skills important when writing their UCAS personal statements, such as communication, teamwork and problem-solving, are reassuring. Highlighting such skills in a graduate job application, with updated examples that demonstrate contribution to outcomes and relevance to job and company, are demanding, rather than alien tasks.

The Revolution at Hand

There is increasing prediction and evidence that the growth and complexity of new technologies is starting to extend far beyond enabling traditional, recognisable work, to transform the world. Schwab (2016) talks of The Fourth Industrial Revolution, where big data, artificial intelligence, bio- and nano-technologies are starting to combine, creating possibilities that will redefine how we live and the jobs that humans do. Based on research undertaken by the World Economic Forum and a number of associated Global Agenda Councils, Schwab identified a number of 'Megatrends' which represent the fourth industrial revolution. He organised them into 'Physical', such as autonomous vehicles and advanced robotics; 'Digital', for example the Internet of Things, where people relate to and engage with products through connected technologies and platforms; and 'Biological', exemplified by the speed at which a human genome can now be sequenced - a few hours - compared with the 10 years it took to complete the original Human Genome Project. Some examples cited are familiar to many, such as the rise of Uber, or targeted medical treatments based on high quality genetic data. Equally, Schwab accepts that at the time of writing, some concepts are still abstract and he features a number of yet-to-be-tested predictions alongside examples. He concludes by calling leaders of all aspects of society to engage with these changes together to develop holistic perspectives that can identify integrated solutions, so that the revolution is harnessed to improve, rather than undermine, a society where humans can thrive.

Stephen Hawking, Bill Gates and Elon Musk are amongst those concerned by the threat to human labour from advances in robotics. Hawking continues to warn that artificial intelligence could transform society through the eradication of poverty and disease, but could 'evolve' to the point of outperforming

humans, presenting as a threat, not a powerful, controllable force for good (Osbourne, 2017) while Gates has suggested that those companies using high levels of robotic labour should pay a 'Robot Tax' in order to compensate for the loss in taxes from human workers. This could help to pay for jobs where human interaction will apparently remain paramount, such as caring for children and the elderly (Waters, 2017). Musk has called for a Universal Basic Income for those whose work is displaced by automation altogether (Weller, 2017). A more optimistic perspective suggests that sector changes will result in the redistribution of human labour to improved jobs, possibly in greater numbers (Bakhshi, 2017).

Susskind and Susskind (2015) approach this issue from the perspective of the professions including health, education, law and architecture, traditionally dominated by graduate level jobs. They contend that technology and artificial intelligence will transform roles currently fulfilled by human experts applying specialist knowledge and expertise. They suggest that in a technology-based internet society, traditional professional work will be seen as unaffordable, antiquated, opaque and underperforming. They also suggest a number of trends which demonstrate the movement of professional work, traditionally considered an individually delivered craft, towards configurations resonant with processes. They suggest this is taking place in three ways: 'routinisation' where appropriate elements can be configured into processes introducing higher levels of efficiency and consistency akin to standard operating procedures; 'decomposition' – the breaking down of professional work into component parts, 'multi-sourced' for fulfilment through other people or technology; and 'disintermediation and re-intermediation' where professionals replace elements of their face-to-face service with an online version or try to deliver their services online to enhance their presence (Susskind and Susskind, 2015: 119-123). The authors provide many examples where this is already taking place, including education, where they suggest that the move towards blended learning, flipped lectures, Massive Online Open Courses (MOOCs) and open-access online journals, harnessing the new technologies available, provides more personalised learning experiences changing the nature and range of roles within education:

In all of these illustrations the historical monopoly of traditional teachers, tutors and lecturers is challenged. There is less need for the 'sage on the stage' and more of a job for the 'guide on the side'…. There are new roles and new disciplines, like education software designers…content curators… and data scientists.   (Susskind and Susskind, 2015: 60)

Changes to professions are expected to impact directly on the availability and nature of many graduate roles, with change particularly notable in areas where experience and knowledge have traditionally been built through large amounts of information management and analysis within early career responsibilities. For example, artificial intelligence now enables the rapid scanning of hundreds of legal documents for consistencies and inconsistencies, traditionally the work of those beginning their legal career. Another illustration is the change to the hiring pattern of Goldman Sachs' stock traders; from 600 in the year 2000, to just two graduates in 2017, the remaining work undertaken by 200 computers (Gleason, 2017). That it was tempting to write 'two humans' in the preceding sentence is perhaps telling.

The Challenge to Careers Professionals in Higher Education

Graduate jobs are being transformed, amidst as much speculation as evidence, but now is the time to review practice, not cling to traditional assumptions about graduate careers, if students are to be prepared for a work life that spans decades. This section considers key challenges to careers professionals and the opportunities offered by these changing times to futureproof expertise and practice.

A profession is considered a distinct type of occupation, which uses a specialised body of knowledge and expertise to solve a particular type of problem (Torstendahl, 1991). A challenge that professional groups have faced in relatively recent years is that of 'information asymmetry' (Abbott, 1998), where information on many issues is readily available to all. This changes the deployment of professional expertise from the provision of information to the

interpretation and application of information to a setting, group or individual. As graduate careers change in ways described above, information on future roles and career paths is speculative, tentative and subject to change.

This presents a challenge to careers professionals, whose understanding of graduate roles and career paths provides context for their work, particularly when advising and guiding students making career choices. Knowledge about graduate roles built up over a number of years, even previous personal experience, may soon be far less relevant. This challenge may be heightened in services where an 'account management' approach to key graduate recruiters reinforces a focus on recruitment processes, rather than understanding the projected shape of a career a number of years hence affected by technological advancements. Relationships that focus on recruitment processes and outcomes are critical, but without keeping abreast of the conversations and trends at the heart of organisations, it may be difficult for careers professionals to enable students to navigate much beyond an altered opportunity structure, graduate recruitment processes and the first two years in the workplace.

Before the concept of the fourth industrial revolution was widely discussed, a study was undertaken across 14 institutions in England, Scotland and Wales, interviewing 22 careers advisers in higher education, with varied backgrounds and qualifications, about their professional identity. It suggested that their identity was undefined, locally focussed, unrecognised, unconfident but dedicated (Thambar, 2016). The study identified a reluctance for careers advisers to define themselves as experts, which can be explained by the aim of enabling students to manage their own career development, rather than to maintain a stronghold on scarcely available knowledge to encourage dependency (McCash, 2006). However careers advisers also described an absence of a clearly defined body of knowledge that they can claim as their own, particularly when engaging with academics. The subjects of the study described that knowledge as occupational and sector intelligence, rather than the guidance and career development techniques and theories that underpin their work. Feedback from the dissemination of this research nationally and

internationally indicates a resonance with careers professionals, not only careers advisers. In an academic setting where expertise defines individual roles and shapes institutional purpose, it is incongruous for careers professionals to seek recognition and operate with confidence without their own clearly-articulated expertise (Thambar, 2016).

The Opportunities for Expertise

The uncertainty surrounding graduate work provides new opportunities for careers professionals in higher education to develop expertise and specialist knowledge that strengthens their practice. The quaintly titled, but still relevant Labour Market Information, with occupational knowledge, can be reinvented by being at the forefront of insights into the future of graduate work. Engagement with current debates and workplace developments, not just recruitment trends, illustrated with real-world examples, would give careers professionals a knowledge advantage and refreshed authority within their field.

This may mean reviewing engagement strategies with employers to extend beyond strong links to facilitate graduate-entry recruitment to the building of insights into the projected evolution of graduate career paths. As change gathers momentum, individual perspectives and experiences could illuminate and contextualise wider-ranging surveys. Alumni well established in their careers, perhaps in the eye of the technological storm responsible for crafting their organisation's future work, could become as valuable to careers professionals for their practice as to the students encouraged to make alumni connections.

Such approaches could support a refreshed presence for student-facing careers information that balances trends and predictions with information on graduate roles in their current form. This will help to create a distinct identity for knowledge developed and deployed by careers professionals as an informed, impartial assessment of present and future graduate work. This is likely to be welcomed by students attempting to plan and envisage their future, bombarded by speculation as debates about a world, defined and altered by advanced robotics and technologies, enter popular culture.

As careers professionals translate and decode these debates to support students with their career planning, providing reassurance in uncertain times, they would naturally address the challenge of 'information asymmetry'. There may also be a further learning and service opportunity for some when students are helped to understand the developments taking place by reflecting on the role technology already plays in their lives. This would require insights into technological interactions with distinct generational characteristics, which would enable those working with entrepreneurial students to keep pace with evolving possibilities.

More than ever before, students will need to understand how they can still develop relevant skills and experience for an undefined future of work, with an emphasis on long-term employability rather than immediate employment. For those advising and guiding students, understanding and conveying a range of career theories, not least the interplay between decision making, opportunity awareness, transition learning and self-awareness (DOTS), could help students to develop conceptual frameworks and ways of thinking that equip them to develop their career over time (McCash, 2006). Appreciation of career theories such as 'planned happenstance' (Krumboltz, 1998) and concepts such as a growth mindset that introduces possibilities through learning, trying and taking risks (Dweck, 2006) will prepare students to navigate an unpredictable future. This requires expert knowledge of career theories and the process of employability development alongside the ability to translate that process for those who are being supported and enabled. These are not new features of professional careers work, particularly for careers advisers, but describing guidance, careers education and career development skills in the context of the future of work, provides an opportunity to refresh and re-badge expertise, emphasising its relevance to the challenges that students are likely to face.

Robots as peacemakers: Academic and Employability experts aligned at last?

Strengthening careers professionals' expertise may better position them as the institutional experts on

graduate careers, equipping them for an academic environment with a distinct body of occupational and sector knowledge that contextualises their practice, and provides a confident basis from which to discuss the future of work with academic colleagues. However the uncertain graduate landscape provides a further opportunity for those seeking to engage in academic partnership to support or enable institutional employability approaches. Despite the institutional spotlight on employability in the UK, particularly England, often in response to higher undergraduate tuition fees, a narrative still prevails that 'being academic' and 'being employable' are parallel paths within the student journey. These paths align on vocational courses leading to an academic qualification that grants admission to professional practice or accreditation (for example veterinary medicine or branches of engineering). In other disciplines, the paths are often distinct with work resulting in successful alignment lending weight to a narrative that employability has been brought into the curriculum. This implies that previously, an academic curriculum might have been 'employability-free'. However, the World Economic Forum has identified ten skills that it suggests will equip workers of the future for career success in the fourth industrial revolution. They are listed here:

Figure 2: Skills for Success in the Fourth Industrial Revolution (World Economic Forum, in Schwab, 2016)

1.	Complex Problem Solving	6.	Emotional Intelligence
2.	Critical Thinking	7.	Judgement and Decision Making
3.	Creativity	8.	Service Orientation
4.	People Management	9.	Negotiation
5.	Co-ordinating with Others	10.	Cognitive Flexibility

Schwab (2016) does not explicitly refer to the skills required for roles involving significant interaction with advanced technology. However, an investigation into the skills required for work in 2030 conducted by Bakhshi et al (2017) is complemented by a list of 20 skills which includes those needed to engage effectively with new technologies:

Figure 3: 21st Century Skills (Bakhshi et al, 2017)

1.	Judgement and Decision Making	11.	Critical Thinking
2.	Fluency of Ideas	12.	Instructing
3.	Active Learning	13.	Education and Training
4.	Learning Strategies	14.	Management of Personnel Resources
5.	Originality	15.	Co-ordination
6.	Systems Education	16.	Inductive Reasoning
7.	Deductive Reasoning	17.	Problem Sensitivity
8.	Complex Problem Solving	18.	Information Ordering
9.	Systems Analysis	19.	Active Listening
10.	Monitoring	20.	Administration and Management

These two lists effectively challenge the concept of an employability-free curriculum, indicating that complex problem solving, critical thinking, creativity, cognitive flexibility, fluency of ideas, deductive and inductive reasoning, all fundamental to academic endeavour, are skills for future career success. This gives careers professionals an opportunity to build strong partnerships with academic colleagues, not simply to find 'slots' of time for employability input, or encourage signposting to careers services, but to collectively present and refine the students' curricular experience to support their employability development. This is traditionally an area where partnership is hard won or the result of an institutional mandate and, in the case of careers advisers, where a sense of being a junior partner through a lack of qualification or a defined body of knowledge can undermine confidence and agency (Thambar, 2016). However, the possession of cutting-edge knowledge about the latest developments to graduate roles across sectors, while supporting academic endeavour as relevant to the future employability of students, provides the basis for a balanced partnership. Careers professionals could work alongside academic colleagues to make the implicit explicit in relation to student development of academic skills to support their employability. In this setting, careers professionals would not have to 'fight their way in', and academics would not feel distracted or undermined by the prospect of accommodating

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employability development at the expense of their core practice and subject expertise. Tensions around the purpose of higher education can dissipate as a transformational learning experience in its own right simultaneously equips students for their future career.

An example of this in practice, is the development of professional competencies within the curriculum at the University of Nottingham. A working group of academics and careers professionals, having considered the current thinking on the future of work, have mapped the academic, co-curricular and extra-curricular Nottingham student experience to identify the opportunities available for the development of each of the ten skills in figure 2. From this the group has identified four competencies which are naturally developed through academic study and will prepare students for success in the future: professional communication, digital capability, co-ordinating with others and reflection. Examples of assessed activity through which students will develop these competencies are currently being gathered, alongside case studies and identified champions to support academic development and messaging for students. This development has been welcomed at an institutional and disciplinary level for supporting a response to changes to graduate work, while acknowledging the continued relevance of academic endeavour.

Conclusion

The future of work, and the impact of artificial intelligence and advanced technology on graduate jobs, is uncertain in shape but not likelihood. The challenge for careers professionals is to harness this uncertainty and position themselves at the forefront of the debate, understanding the speculation and contextualising it through their own investigation, enhanced by engagement with employers and career-established alumni whose perspectives and examples will deepen understanding of the changing opportunity structure. This rejuvenated expertise could then be used in combination with career development skills to prepare students to succeed in an uncertain future. The expertise could also be used as a basis to forge strong, mutually respectful, partnerships with academic colleagues so that students recognise that by developing their academic skills they develop their

employability. Confirming this approach would enable institutions to communicate a consistent message of responsiveness to the future of work, which would enable employers to engage, and students to flourish, even while preparing for a world that few of us dare to predict.

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