Graduate attributes for the digital age

Graduate attributes are both an aspiration - a statement of the qualities that individuals should have on graduating from a programme or institution - and an agenda for designing the learning experience to ensure opportunities to develop those qualities. It has never been more important for Higher Education to demonstrate that its aspirations are credible and relevant. In the future it may be even be required to evidence that graduates are attaining the attributes that they aspire to, and to show the value the HE experience is adding. This is at a time when some experiences that were once unique to a university education are widely available, for example as open educational resources and online communities of practice. So it is timely to reconsider what aspirations universities should have for their graduates, and how they will prepare graduates for leading roles in an age of digital information and communication.

Reflect on/discuss with colleagues:

- The general trends identified in the examples below. Do these hold true for you? Are other trends more significant? How do they play out in your context/for your students?
- The trends in your specific profession or subject area. Consider for example how these are changing: use of information; privacy and data security; research and innovation; publishing and sharing information; organisational structures and boundaries; relationships with customers/users/clients; business models; CPD and professional identity management.
- Your experience of teaching and supporting learners: Work through the *'meeting the needs of learners*' document if you have not already done so

Then consider the following questions:

1. What might graduates of your institution or programme be doing for work in 5 and/or 10 years' time?

2. What will distinguish 'successful' graduates of your institution or programme (not confined to work issues)?

3. What capabilities and attributes will your graduates need to be successful?

4. What experiences in learning will help them to acquire these capabilities and attributes?

5. How will learners come to understand, be supported in, and take ownership of these capabilities and attributes?

General trends (examples from a range of sources*)	Relevant attributes and skills (examples)
Changing nature of **work**, for example: • Growing numbers of graduates directly employed in the 'digital' industries (est. 1,500,000 2009/10). • Almost all graduate jobs requiring ICT competence • Digital working practices allow organisations to recruit skills and expertise on a global scale • Trend towards division of labour in the service and intellectual industries, breaking down professional roles • A greater requirement for workers to be independent, self-directed and self-evaluating • Tendency for individuals to move jobs and careers more frequently and to be in fixed-term or flexible contracts • Learning throughout life becoming a requirement in all professions, as innovations spread more rapidly • Longer working lives but with elements of home work, voluntary work, caring, self-employment • Digital reputation becoming more significant in finding work • New pressures (to update skills, offer continuously high performance, compete in global marketplace for expertise)	Advanced ICT skills and the capacity to continuously update them Advanced knowledge and information handling Understanding of digital IPR and other relevant legal frameworks Interdisciplinary thinking and grasp of multiple methods Problem solving and creative thinking Broad business skills e.g. analytics Transferability of skills and learning across contexts Manage work/life balance as technology erodes boundaries
Networked society, so that for example the following are enacted through digital means: • citizenship (voting, expressing opinion, persuading, volunteering, citizen journalism etc) • participation in local, national and global cultures • participation in workplace and other organisations, (working groups, committees, mentoring etc) • managing well-being of self and community (accessing information and services etc)	Citizenship Critical thinking/critical action Social entrepreneurship Managing digital identity and reputation Digital safety
Access to information, which might now include: • Personal data, geospatial data, data embedded in devices/locations, social data... • Near-ubiquitous facility to connect with data sources, people and tools • New tools for finding, collating, analysing, repurposing and publishing information • Data mash-ups transforming how we relate to and share information • Range of media used to communicate socially and economically valued information • Blurring of boundaries between information and communication, as information is continually re-circulated	Information skills including: Information filtering Sharing and enhancing info, e.g. through commenting, reviewing, annotating, re-using, tagging Participation in knowledge-building and using communities Creative/intellectual production in different media Critical reading of messages in different media
Technology, for example: • Services increasingly organised around individuals rather than institutions • Communications convergence (devices and media) • Social operating systems, organised around social networks and making use of collective intelligence • Security, identity management and data protection at a premium • Peer-to-peer networks • More devolution of responsibility onto computer systems and networks, with implications for human work roles	Maintain personal and organisational data security Be informed ICT consumer and user Take personal responsibility for technology systems/services Create and manage own environments for learning and work Work in networks of expertise with other people and ICT systems

General trends (examples from a range of sources*)	Relevant attributes and skills (examples)
Knowledge and media, for example: • Mass participation in knowledge use/re-use and publishing, challenging existing forms of scholarship • New tools for generating knowledge from e.g. participation in networks, semantic technologies, data mining • Transfer of attention from print to screen • Multiplicity of media for knowledge representation, including hyperlinked and hybrid media • New participatory practices in research and subject communities • Blurred boundaries of information and communication – from 'produce-publish' to 'create-circulate-recreate' • New modes of writing/composition • New modes of academic communication and argumentation • Open scholarship (research, content, data) challenging copyright and authority • (But also) the digital marketplace in content – conflict between the creative commons and commoditisation of knowledge	Adaptability and transferability of knowledge skills Multi-tasking Judgement and critical evaluation Collaboration: capacity to build and maintain relationships in knowledge work Express oneself in a diverse range of media and to diverse audiences Be creative and innovative in communication Understand legal aspects of knowledge sharing Behave ethically in media environments where different values collide
Education and learning • Open educational opportunities for self-organised learners • Expansion in informal/peer learning through common interest groups; fewer barriers between formal and informal learning • Innovative collaboration tools • Learner-generated contexts for learning • Broadening of curriculum (less discipline focus) and move from common syllabus towards personal learning pathways • Focus on transferability of knowledge rather than knowledge to be learned • Established methods, based in disciplines, giving way to complex interdisciplinary problems • Flourishing research on pedagogy and the science of learning • Students' approaches to learning being actively developed	Learning to learn Collaborative learning Self-directed learning Digital scholarship, digital research Reflection, planning and recording progress, especially using digital means
• **Green ICT and sustainability** • Increasing focus on reducing carbon costs • ICT used to reduce travel, support smarter use of resources • Embedded data allowing constant real-time monitoring of e.g. energy use • Innovative use of renewable resources to power devices and networks/servers e.g. kinetic energy from bodily movements powering wearable devices • Social pressure for more sustainable socio-technical practices	Sustainability literacy, e.g.: Identifying threats to self, community and environment Understanding carbon costs of technologies and services Using ICT to work/study/live in more sustainable ways e.g. cutting down on travel Making ICT choices based on sustainability
• **Globalisation/internationalisation** of learning and work, which might involve: • Physical mobility (students, scholars and professionals) • Communication across different cultures • Recognition of prior study across national boundaries • Other modes of knowledge transfer (collaborative research, transnational education) • International orientations and attitudes being demanded by employers	Collaboration across national and cultural boundaries Identifying global learning and information resources International orientation Mobility (cultural and geographical) e.g. recording achievements in globally recognised forms

*__Sources__

In defining these trends and associated graduate capabilities, the following resources were reviewed:

- Challenge summaries from Beyond Current Horizons (2008/09, UK, all sectors, lookahead 2025)
- Educause Connect report 2008 (2008, US/global, all sectors, lookahead 5+ years)
- Reports from the Open University's 'Open Thinking on HE' (2008, UK, HE, lookahead 10 years)
- OECD Schooling Scenarios (2008, international, schools, lookahead 2020)
- Learning2.0: The Impact of Web2.0 Innovation on Education and Training in Europe
- (2008, 2010, Europe, all sectors + training, lookahead unclear)
- e-Skills UK Technology Counts: IT and telecoms insights (2008, UK, FE/HE/employment, lookahead 3-5 years)

In addition, views were canvassed from a range of educators and specialists at digital literacy workshops conducted in the UK between May and September 2010.