Digital Skills in the Curriculum

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Introduction

Digital skills are key skills that current-day graduates need to thrive in the modern world. At University, students should have the opportunity to develop these skills, alongside softer skills, both as part of the curriculum and through extra curricular activities.

This slide deck, intended to be read as an article, aims to highlight: the importance of developing digital and information literacy skills in the curriculum for all students on all programmes, why graduate attributes should evidence student acquisition of these skills, and touches on how we can do this in curricular teaching and extra-curricular activities.

It provides an overview of:

- Employer demand for digital skills
- Digital capabilities in the curriculum
- Good practice examples of how we are developing students' digital and information literacy
- Implications for curriculum transformation at The University of Edinburgh

If you only have time to read one section, please jump to 'Implications for curriculum transformation at Edinburgh' on slide 19 and the subsequent summary.

Why do digital skills matter?
Employer demand for digital skills

No Longer Optional

Introduction

A key report from the UK government published in 2019, entitled No longer optional: Employer demand for digital skills* highlights the importance of digital skills in the modern workplace.

Digital Skills are defined in this report as 'competences in and/or knowledge of IT tools including computer programs and programming languages'.

The report analysed millions of online job adverts in the UK to provide an overview of the digital skills that employers demand.

The report concluded that digital skills are becoming ever more important in today's economy, and highlighted the importance of both:

- **baseline** digital skills, such as those required to use productivity software tools
- **specific** digital skills using more specialised software that are critical for middle- and high-skill roles (middle-skill roles require a HND/C; high-skill roles require a degree or above).

* Access the report at
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/807830/No_Longer_Optional_Employer_Demand_for_Digital_Skills.pdf

No Longer Optional

Findings: Type of digital skills in demand

The report identified eight clusters of digital skills (skills often found together in job postings):

Baseline digital skills:

1. Productivity software and tools

Specific digital skills:

2. Software and programming
3. Networking systems
4. Data analysis
5. Digital marketing
6. Digital design
7. Customer relationship management software
8. Machining and manufacturing technology

Job seekers who develop skills in one or more of these clusters can qualify for many of the best paying and fastest-growing jobs in today's economy.

No Longer Optional

Findings: Implications for individual success

- Digital skills are in demand across the UK, and are required in at least 82% of online advertised jobs.
- Digital skills are becoming near-universal requirements for employment. Baseline digital skills such as Microsoft Office and other productivity software tools are commonly required in jobs across all skill levels.
- The move up the career ladder from low- to high-skill jobs comes with increased demand for specific digital skills.
    - To maximise chances of success in the digital economy, job seekers must go beyond baseline digital skills and develop more specific skills. Specific digital skills are in demand across all sectors.
    - Specific digital skills are required in 28% of low-skill jobs, 56% of middle-skill jobs, 68% of high-skill jobs.
- Acquiring specific digital skills makes career progression as well as a pay increase more likely, with roles that require digital skills paying 29% more than roles that do not.
- In certain fields, job seekers need to develop digital skills related to specific technical tools of their chosen discipline to advance their careers (e.g. computer-aided design for engineers and technicians, search engine optimisation for marketers, and data analysis skills such as the programming languages SQL and R for analysts).
- Specific digital skills may help workers avoid the risk of automation as they usually complement human skills such as design, writing or communication, which in combination are difficult to automate. By entering a role that requires specific digital skills, workers can reduce their risk of automation by 59%.

What about the academic context?

The No longer optional: Employer demand for digital skills report is just one of many highlighting the importance of digital skills in the modern workplace. There is a wealth of evidence available that supports the case for graduates developing good digital skills to help them achieve success in their future endeavours.

But what does this mean for curriculum transformation? How can we develop students' digital skills as part of curricular teaching, or through extra-curricular activities?

The following guidance from Jisc highlights some key principles to consider, based on experience within UK universities.

How to develop students' digital skills: Digital capabilities in the curriculum

Designing for Digital Capabilities in the Curriculum

Principles for embedding digital capabilities into courses of study: Summary

Jisc, specialists in edtech services and advice, offer training and guidance on how to design opportunities into courses for students to develop their digital skills and capabilities. The Designing for digital capabilities in the curriculum blog (2017) outlines some key principles. These are summarised below and detailed on the following slides.

- Digital capabilities are subject specialised
- Every student brings their own personal digital practices to their subject
- Staff need to be confident in their digital practice as part of their broader teaching expertise
- Digital capability is integral to being effective in a subject area, or a vocation or profession
- When designing courses, think about learning outcomes before thinking about methods and means

* Access the blog at https://digitalcapability.jiscinvolve.org/wp/2017/10/31/designing-for-digital-capabilities-in-the-curriculum-whats-new/

Designing for Digital Capabilities in the Curriculum

Principles for embedding digital capabilities into courses of study: Detail

- **Digital capabilities are subject specialised**. Even the use of generic tools such as a spreadsheet or annotation app are highly dependent on the task at hand. Students really value subject specialist technologies such as data analysis software, design tools and digital instrumentation, and specialist resources such as e-journals, reference management software and subject-specialist networks.
- **Every student brings their own personal digital practices** to their subject, just as they bring their own literacy and numeracy practices, and their own preferences for different media. This variety of digital skills, experiences and preferences can be treated as a resource – for example through group exercises that allow students to learn from one another, or by offering different routes to assessment.
- **Staff need to be confident in their digital practice** alongside their subject and teaching. Students need to feel that their preferred learning practices are being supported and developed, and that staff are up to date with their professional skills. But they don't need staff to be creating amazing digital content, to be as proficient in media production as they are, or to be engaged in all the same social media.
- **Digital capability is not a separate aspect of learning** but integral to being effective in a subject area, or a vocation or profession. Nor is it separate from other agendas such as employability, sustainability or internationalism. Look for digital activities to include in teaching that are complex enough to address several agendas. Introduce approaches that are genuinely used by digital researchers or professionals, not for the sake of being digital, but for the sake of achieving meaningful outcomes.
- **Think about learning outcomes** (what learners need to know) before thinking about methods and means (the technologies learners need to encounter). Digital technologies are changing every subject. There are new research questions and methods, new approaches and ethical issues to consider, whole new branches of knowledge and qualifications that did not exist fifteen years ago. Think about how the digital world changes the purpose of your course, and you will naturally be led to interesting activities that involve digital technologies in a meaningful way.

Examples of digital skills in the curriculum at The University of Edinburgh

Wikimedia and The University of Edinburgh

Wikimedia editing and using Wikidata as part of the curriculum

There are many good examples across the University of how students' digital skills are already being developed as part of the curriculum, and it's important that we share and celebrate this good practice to inspire others to do the same. While we've focussed so far on employability skills, students also need to develop their digital and information literacy skills to help them study effectively. One way in which this has been achieved at Edinburgh is through the use of Wikimedia in education.

The University of Edinburgh was the first university in the UK to employ a university-wide Wikimedian in Residence. The Wikimedian works with course teams and students across the university to facilitate engagement with Wikimedia projects as part of the University's strategy to develop information and digital literacy skills.

Courses at undergraduate and masters level are incorporating Wikimedia editing activities in many different parts of the curriculum. Many of the editing events have had a focus on addressing the underrepresentation, and improving the visibility, of women online, delivering on the University's commitment to equality, diversity, and the sharing of open knowledge.

Wikipedia's sister project, Wikidata, offers students the chance to engage with issues of data completeness, data processing, data analysis and data ethics. Importantly, students are also working practically with real world datasets and make use of a large range of tools and data visualisation techniques to tell engaging stories and help further discovery and areas for future research through linked open data and the semantic web. The skills attained through engagement with Wikidata are transferable to many disciplines from the sciences to digital humanities to cultural heritage.

Wikimedia in Education

Wikimedia editing and using Wikidata as part of the curriculum

A booklet entitled Wikimedia in Education, produced by Wikimedia UK and The University of Edinburgh, brings together case studies from across the UK to provide insight into the use of Wikimedia projects in education.

Access the booklet at https://open.ed.ac.uk/wikimedia-in-education/

Of the 14 case studies, five pertain to The University of Edinburgh including:

- World Christianity MSc
- Reproductive Biology BSc
- Translation Studies MSc
- Design Informatics MA/MFA
- Masters in Public Health

Summaries and learning outcomes for each are on the following pages – use the link above to access the full details of the case studies in the Wikimedia in Education booklet.

Find out more about the work and projects carried out by our Wikimedian in Residence at https://www.ed.ac.uk/information-services/help-consultancy/is-skills/wikimedia

World Christianity MSc, University of Edinburgh

Students each selected a topic to critically analyse, and synthesised peer-reviewed literature to create new articles on Wikipedia in the field of World Christianity Studies. The assignment provided an opportunity for the students' research to have a published output and increased the breadth and diversity of content online.

Learning outcomes

- Developing writing skills suited for a public audience.
- Increasing information & digital literacy, and critical thinking.
- Introducing collaborative writing, useful for future academic and work-based projects.
- Increasing sophistication in students' research skills; ensuring their research application is at an academic standard.

Dr. Alexander Chow, Senior Lecturer in Theology and World Christianity, CC-BY-SA by Stinglehammer.

Reproductive Biology BSc, University of Edinburgh

4th Year Reproductive Biology Honours BSc students researched and developed new Wikipedia articles on previously unpublished medical terms relating to their course content. This assignment has been repeated each year since 2015.

Learning outcomes

- Learning to write accessible articles for public audiences on medical subjects.
- Learning to use science-specific research platforms effectively in conducting research e.g. Scopus and Web of Science.
- Increasing information and digital literacy and critical thinking, (including lessons in Wiki-software formatting).
- Introducing collaborative writing, in a format well-suited to future academic and work-based settings.
- Increasing sophistication in students' research skills; ensuring their research application is of an academic standard.

Dr. Simon Riley, CC-BY-SA via Simon Riley.

Translation Studies MSc, University of Edinburgh

A Wikipedia translation assignment was integrated into the Independent Study component of the MSc in Translation Studies, with students translating 1,500-2,000 words from a quality Wikipedia article and publishing to a different language Wikipedia in a wide variety of languages (Arabic, Chinese, Danish, English, French, German, Japanese, Norwegian, Spanish, Swedish, and Turkish).

Learning outcomes

- Developing practical translating skills suited for a public audience.
- Studying the transmission of knowledge across different language and cultural contexts.
- Challenging entrenched hegemonies and contributing to the free circulation of knowledge.
- Increasing critical thinking, in addition to information and digital literacy.

Translation Studies MSc students and course leaders, CC-BY-SA by Mengqi Yuan.

Design Informatics MA/MFA and the Survey of Scottish Witchcraft Data Project, University of Edinburgh

Design Informatics students on the Data Science for Design course were given the opportunity during the annual Data Fair project to work with the Survey of Scottish Witchcraft database. They imported data on Scotland's accused witches and witch trials from this resource to Wikipedia's sister project, Wikidata, as 5-star linked open data to give a real-world practical example of analysing, manipulating, contextualising and visualising data in engaging ways.

Learning outcomes

- Data analysis: the ability to analyse, learn from and visualise a range of data, in a way that demonstrates its relevance to particular contexts.
- Communication skills: discussing socially relevant issues, supported by the use of multiple data sources and appropriate analysis.
- Professionalism: working in collaborative, interdisciplinary teams to a high professional standard.
- Data literacy: developing data literacy through the practical application of working with a real-world dataset.

Masters in Public Health (MPH), Investing in Global Health and Development, University of Edinburgh

Adding to Wikipedia's Global Health related content. The students researched, synthesised and developed either one existing Wikipedia article, or created a new one, for the field of Global Health.

Learning outcomes

- Knowing how to write about Global Health for a public audience.
- Learning how to find and reference appropriate sources for communicating medical knowledge.
- Learning about the Global Health subjects of the students' choice.
- Learning about today's online publishing landscape.

Dr. Felix Stein, CC-BY-SA via Felix Stein.

Extra-curricular digital skills development opportunities at The University of Edinburgh

Digital Skills and Training

On-campus training, webinars, online courses, toolkits, internships and more

The Digital Skills and Training team within Information Services offers a range of ways in which students can develop their digital skills outside of their studies. These include:

- Student internships for experiential learning
- Two Edinburgh Awards: Digital Skills Specialists and Digital Volunteering with Wikipedia
- Digital Skills Framework for skills assessment and development planning
- On-campus training and online webinars
- Online courses provided through LinkedIn Learning
- Skills development toolkits highlighting the digital skills that students should develop across each year of study, with curated learning resources
- Developing Your Data Skills programme
- Digital Safety and Citizenship hub
- Wikipedia editathons and engagement with the Wikimedia suite for open knowledge sharing
- Annual Digital Skills Festival

The team has also delivered sessions to support various programmes of study including: Building Blocks of UK Copyright and Exceptions for Clinical Practitioners; Wiki course for Clinical Immunology and Haematology; Producing a Dissertation using Word for Nursing Studies.

Find out more about Digital Skills and Training at http://www.ed.ac.uk/is/skills

Implications for curriculum transformation at Edinburgh

Implications

Implications for curriculum transformation at Edinburgh

- **We need to ensure that graduates leave Edinburgh with both digital and non-digital skills.** A complete package of skills is essential for success in the workplace, and many digital skills serve to enable non-digital expertise.
- **We need to offer our students opportunities to develop both baseline and specific digital skills, and encourage them to do so.** Baseline digital skills such as Microsoft Office and other productivity software tools are commonly required in jobs across all skill levels, and the addition of specific digital skills can positively influence career and pay progression.
- **Graduate skills should be developed to anticipate the rapid change of in-demand digital skills.** Many of the most desirable skills hardly existed a few years ago and we must prepare our students for the future, not just the present.
- **We should integrate digital skills development into the curriculum and incorporate subject- or course-specific context.** Digital capabilities are subject specialised, and not a separate aspect of learning. They are integral to being effective in a subject area, or a vocation or profession.
- **Within the curriculum, we can teach digital skills at the same time as softer skills.** Digital skills usually complement human skills such as design, writing or communication and it is this combination of soft and technical skills that is valuable.
- **We must provide training and support to teaching staff, and teaching staff must take responsibility for developing their digital skills.** Staff need to be confident in their digital practice alongside their subject and teaching.
- **We need to ensure a consistent level of digital skills development from one programme to the next, and from one student to another.** We have good examples of curricular and extra-curricular digital skills development activities within the University on which to build.

Summary

Summary

The Curriculum Transformation Programme provides us with a unique opportunity to really integrate the development of digital and information literacy skills into curricular teaching, complemented by extra-curricular skills development opportunities. Modern-day graduates require not just subject-specific knowledge, but also soft and digital skills to succeed in the workplace.

While we have good examples of student digital skills development across the University, we need to ensure consistency across programmes and student experience while maintaining the flexibility required across the broad range of subjects that we teach.

To enable this to happen, we need to provide training and support to those who teach, and teaching staff must take responsibility for developing their digital skills.

It’s essential that we make the most of this opportunity, and that we do it now.