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Outward-facing student assessments

1 Revisiting student assessments

Dimension five of the Connected Curriculum framework focuses on assessing students' learning, and on the value for students of learning to produce 'outputs' – assessments directed at an audience. As they develop their learning through enquiry, students can become increasingly aware of people and groups in wider society who may have an interest or stake in those areas of learning. Through some of the work they produce for the purpose of being assessed by faculty members, they can engage with internal and/or external audiences. Some student assessments become, in effect, outputs from their research and enquiry. In expressing their new learning in different forms and language registers to different audiences, students enhance their communication skills and digital practices. Where possible, students' work will make an impact on local and wider audiences, and enable not only information-sharing but two-way engagement between students and audience.

　　Why is this emphasis important? Assessing students' learning in higher education is a high-stakes activity. As well as being extremely time-consuming, both for students and for assessors, assessment can determine students' futures. By designing particular kinds of student assignments, educators are shaping the ways in which students orientate themselves to their studies. By ascribing grades or scores that translate to a particular degree classification, assessors may be significantly affecting students' opportunities for further study or access to a profession. And by providing feedback on assessment tasks, assessors are not only giving information about progress and attainment but affecting students' self-confidence and self-concept.

　　The range of forms of student assessment used across the sector is growing (Bryan and Clegg 2006), and Knight (2002) argues that we

need to make students' experiences of assessment as authentic, effective and efficient as possible. How can we do this – for students, for teachers and assessors, and even for wider society?

2 Towards authentic assessment

What is the traditional student assessment cycle? Table 7.1 offers a broad-brush summary.

After this cycle is complete, or even before completion, the cycle may begin again with attention directed towards another assessment. In modular or multi-stranded programmes, assessment cycles may run simultaneously, challenging students to juggle with multiple deadlines.

Table 7.1   Traditional student assessment cycle

	Traditional sequence of activities in student assessment cycle
1	Students take a class and/or undertake independent learning (e.g. via a virtual learning environment, through wider reading or experiential learning).
2	Students are informed about the assessment, or sequence of assessments, for this learning theme/phase.
3	Students are informed (to varying degrees) about the criteria that will be used to allocate marks or grades for that assessment.
4	Students are given instructions and advice about how to approach the assessment.
5	Students may undertake developmental, formative assessment to gain some feedback on their progress in this area of learning, before submitting their formally assessed (that is, summative) work.
6	Students prepare for their summative assessment, either individually or in collaboration with peers (where the latter is permitted and required).
7	Students undertake the assessment (e.g. write the essay; complete the group project; give the presentation; sit the exam).
8	Students submit the assessment to the assessors, who are already experts in the field.
9	Students await feedback on the assessment, or at least for notification of agreed marks.
10	Feedback and/or marks are made available.
11	Students may or may not access the feedback on their work.
12	Students may or may not assimilate the feedback and actively use it to inform future approaches to learning and assessment.

Of course certain types of provision may differ from this considerably; for example, some online courses build assessments directly into online learning activities. The number, size and type of assessments can also vary greatly between subjects, as can the kinds of feedback and the length of time students wait for that feedback. However, the assessment cycle often follows this kind of pattern.

What changes if we look differently at some of these assessments and re-frame them as outward-facing outputs of enquiry? First, it is important to note that, if changes are made, the fundamental principles of good practice for assessment and feedback still apply. A number of scholars offer research-informed guidelines on these practices: see, for example, Bloxham and Boyd 2007; Nicol and Macfarlane-Dick 2006; Boud and Falchikov 2007; Evans 2013; and Clarke and Boud 2016. These studies make recommendations about issues such as the importance of aligning assessments to the learning activities and intended learning, the degrees of validity and reliability built into the design of the assessment method, and the fairness of marking. Also important are the timeliness and relevance of feedback to help students learn and the need to ensure that assessments are designed for and accessible by students with diverse backgrounds, experiences and accessibility needs (Wray 2013).

However, through a more research-based, connective curriculum we have the opportunity to imagine new possibilities for assessing students: by setting up some assessed activities to mirror the kinds of communications, including public engagement activities, that are undertaken by researchers and enquiring professionals in many fields. If outward-facing assessment opportunities are built thoughtfully into the overall pattern of assessments in the programme, for example by placing them at regular intervals in a connected 'throughline' of core activities (Chapter 4), they can also enable students to develop a unique personal learning story. This brings together two aspects of authenticity: assessments are experienced as genuine because students face 'real world' enquiry-based challenges *and* because students are able to express themselves in their own voices, through communication styles they (in groups and/or individually) have chosen.

3 Possibilities for practice

How might this work in practice? As is always the case with any learning design decision, there will be different possibilities and

emphases in different disciplines, but four key questions need to be addressed:

- **What kinds of 'outputs' might students produce?**
- **To whom is their research directed?**
- **How will students' research outputs be collated and curated?**
- **How will assessment and feedback processes be affected?**

Each of these will be addressed in turn.

Outputs

In our digital world, which has expanded hugely the number of ways in which we can communicate with others, there are now numerous possibilities for assessment. Substituting just a selection of the traditional forms of assessment, such as timed examinations, essays, laboratory reports and short-answer tests, with outward-facing assessments opens up new possibilities for challenging and engaging students. Assessments in the form of outputs or products might include, for example:

- Narrated slide presentations (online)
- Web pages
- Blogs
- Podcasts
- Wikis
- Short videos, combined with analytical webpage commentary
- Film documentaries
- Poster displays (in real time and/or online)
- Exhibitions (for example, of designed products or artworks, or of the questions, tools and findings of research and enquiry)
- Simulation exercises, demonstrated to an audience
- Individual or group oral presentations, directed at a designated audience
- Multi-media presentations
- Demonstrations
- Performances
- Student-run events, such as an undergraduate research conference or an event for alumni or employers, where assessment of group work and/or event management may be included in the assessment criteria.

These are just some initial suggestions: different subject disciplines naturally orientate towards some but not others and, indeed, some of these assessment methods are already standard practice in certain fields. Disciplines will also add a number of different options that fit better with their disciplinary framing and culture. But even the brief range here indicates how many modes of communication may come into play if we look again at the possibility of enriching the traditional assessment range.

Some disciplines, for example Literary Studies and Philosophy, have the academic essay form very deeply embedded in disciplinary thinking and practice. Essays are sometimes heavily criticised for being anachronistic and difficult to assess reliably but there are good reasons for the longstanding love of the form. Developing an argument that is supported by evidence is of central importance and the aesthetic of the essay comes into play. The use of language in an essay takes on an aesthetic quality that raises it far above a pragmatic expression of knowledge, and is central to thinking, expertise and practice in a number of disciplines. So for some subjects the essay may still remain a dominant form. However, the essay form can be enriched if students are (sometimes) asked to consider a specific context and audience for a given essay; for example, to write as if it were to be published in a particular journal or read by a nominated readership such as a particular interest group. And of course essays can be supplemented by other forms of assessment, which stretch students in different ways.

Use of documentary film has huge potential for assessment, as yet untapped in many departments. The serious film documentary might even be seen as the modern equivalent of an essay. Russel Tarr (2016, 42) proposes that essay writing can be 'refreshed' by introducing students to the 'fine art form of documentary-making'. Having used it very effectively in a school setting when teaching history, he argues that this is a highly achievable activity for students, helping them to develop their research skills and powers of argument as well as media literacy, and even building confidence in using their voices when presenting to an audience.

The forms of assessment can be many. The key for this dimension of the Connected Curriculum approach is to see whether, at each level of study, some assessments can stretch students' digital and communication skills as they collaborate to create a product that will express their learning (knowledge, skills and attitudes) to nominated others.

Some educators may be daunted by the idea of asking students to use, and therefore develop, skills in areas with which they themselves are

not familiar. This needs some thought: where will students get advice on how to develop those skills? But our underpinning premise of the value of learning through enquiry comes into play here. Many students in real life are likely to search online videos for advice on new skills, or elicit help from others via social networking. Others will have less digital and social capital, so providing some accessible guidance, perhaps with the help of university experts in digital education and resources, will be valuable. More experienced students can also help those who are less so, through peer or cross-phase mentoring (Chapter 8).

Audiences and partners

Who are the 'others' to whom students are directing their work? Again, there is a very wide spectrum of possibilities, from immediate peers to an unfamiliar audience on the other side of the world. They include:

- student peers in the same class;
- student peers taking a different class, in their own or a partner institution;
- student peers studying at a different level: for example, PhD students present their emerging research to final year undergraduates, or second years present to first years;
- school students (e.g. those studying the subject for an A Level examination or equivalent);
- students from an institution in a different country;
- a local organisation, such as a charity, residents' group or interest group;
- a national organisation, such as a professional body, employers' group or political party;
- a business, whether local, national or multi-national;
- practitioners in a given field;
- policy makers in a particular field;
- publishing companies;
- consumers of particular services (e.g. health or legal services);
- the general public, who have a personal interest in a particular topic (e.g. sustainability, dementia, street art, local history);
- alumni: graduates of their own programme of study and/or from the institution more widely.

Again, this list is just indicative – discipline specialists will select from it and use their own existing and potential contacts to add to it, including those with whom they already connect via their related research and/or professional activities.

Ideally, some assessments would not only be produced *for* an audience but developed in partnership with them. For example, students of statistics might engage with a local charity in order to undertake statistical analyses that will be of real benefit to it. Both the task and the product are then authentically orientated to the needs of the audience-partner. Where the audience comprises policy makers, then a department or programme leader might liaise with a policy maker in the design and content of the learning tasks themselves, in order to direct students' attention to the most current areas of focus.

Challenges for students include the need to be able to build up relevant skills and levels of confidence gradually; this means that whole programme design comes into play once again. It is important that if, in their second year of study students have to make a film documentary, they have had some low-stakes video-making practice in the previous year. The overall pattern of assessments through the programme needs to be mapped out and seen by both educators and students to form a coherent sequence of challenges. This mapping is very much easier if there is a connected 'throughline' of mandatory activities, for example through a sequence of mandatory or 'Connections' modules (Chapter 3).

Challenges for educators include the need to keep their own skills up-to-date; professional development in some areas may be helpful and, of course, there are resource implications for this. However, once in place, embedding this wider spectrum of assessment activities will also contribute to the ongoing development of relevant skills, as staff and students develop their approaches together via shared assessment and feedback experiences.

It may not always be easy to identify appropriate audiences, whether conceptual or 'real life'. Both are valuable but some experience with real-life audiences for all students, at some stage in their programme, raises the quality of experience. Care has to be taken not to exploit audiences for the students' benefits or to derail the intended learning. But the more the audience-focused task can be created collaboratively between the department, students and audience, the better.

The major challenge for educators is time. Planning changes, especially those which take academics out of their comfort zone, takes time and institutions committed to more authentic, research-based

assessments need to take account of this in workload models (see Chapter 10). However, time can also be saved in the assessment processes if a programme is designed to work towards a curated, programme-level portfolio, which can reduce time spent on initial moderation and internal marking processes (Bloxham 2009).

Collation and curation of outputs: the Showcase Portfolio

As suggested when we considered the value of creating a connected sequence of enquiry-based activities that run through the programme (Chapter 4), one approach to assessment that offers much potential is that of asking students to create a programme-wide, or programme-long, portfolio. This has many possible benefits. Nicol and Macfarlane-Dick (2006) argue that, while students have been given more responsibility for learning in some respects in recent years, there has been far greater reluctance to give them increased responsibility for assessment processes, even low-stakes formative processes. Yet, if students are to be prepared for learning throughout life, they must learn to regulate their own learning as they progress through higher education. A programme-long portfolio, which students can shape and edit through the length of the programme, offers them a chance to take ownership of their learning over a period of time, creating a space for 'slow scholarship' (Harland et al. 2015).

What do we mean by a 'portfolio' in this context? As Clarke and Boud (2016) note, there are many kinds of portfolio. These can range from personal scrapbooks of analysis and reflection, to a collation of separate assessments, to explicit mapping against a set of professional standards (for example in teacher education), to an overarching portfolio that collates and curates separate items of work produced. In the latter case, students can connect the elements of their work, or their 'outputs', across the programme with a succinct, overarching, analytical narrative.

My argument is that, while all of these portfolio options are useful, the curated summative portfolio that shows to the viewer the best of the students' work has great promise. We might call this a Showcase Portfolio. A broader, underpinning portfolio that includes reflections on the students' own development and/or constitutes an unedited collation of all their work is of course valuable as a working document; this enables students to manage their own learning, including making and learning from mistakes, without opening all of their activity up to scrutiny by others. But knowing that their work will need finally to be selected and curated, shaped into an engaging whole, for external scrutiny focuses

students' attention on important areas. A Showcase Portfolio challenges students to:

- review their work, as they select and perhaps edit for presentation;
- revisit and learn from feedback on their work, including feedback from peers and external audiences/partners;
- develop a holistic, analytic picture of the ground covered on the programme, including insights gained through active research and enquiry;
- develop a stronger sense overall of the discipline(s) and themes studied and the ways in which they relate to one another;
- articulate explicitly the perspectives and skills underpinning the range of work presented.

New technologies make developing a Showcase Portfolio for each degree programme a realistic possibility:

> Increasingly, sophisticated electronic portfolio platforms support the adaptation of portfolio material to many purposes. The ease with which learning artefacts can be stored and retrieved allows students to keep, manipulate and selectively share their work, revealing it selectively for any desired purpose. (Clarke and Boud 2016, 2)

This portfolio becomes a curated collection of evidence, drawn from the wider range of work across the programme as a whole. A programme-wide portfolio showcases both 'learning skills such as reflection, self-assessment and feedback', and, where appropriate, 'evidence of professional competencies such as clinical judgement and professional requirements, at increasingly complex levels' (Clarke and Boud 2016, 3).

An overall holistic portfolio, which spans a whole programme or perhaps more feasibly just the connected, mandatory core of a programme, enables ongoing feedback to become an embedded element and so remain at the centre of students' attention. For the final Showcase Portfolio students can even be asked to respond to the feedback in a narrative analysing their achievements. The Showcase approach also enables peer assessment and dialogue, and engagement with external audiences, to be included as part of the mapping of activity and analysis of achievement. Students then select from all of the different elements, in line with criteria decided on by the department, to showcase their best work and present themselves as knowledgeable, skilful individuals.

We noted earlier that time is the biggest challenge in the whole process: how can shifting emphasis to a programme-wide Showcase Portfolio save time – or, at least, save enough to make the time spent on the Showcase possible? Sue Bloxham has drawn on evidence to argue, persuasively, that much of the time currently spent on second marking and moderation of smaller tasks throughout the programme can be saved by taking a more holistic approach to students' achievements. Bloxham (2009) demonstrates, in her analysis of current practice, that we waste resources in our well-meaning attempts to ensure fairness as we not only mark but second-mark and moderate. While agreed marking rubrics with specified assessment criteria help with the development of shared under-standings, assessment is not an exact science and can never be entirely objective. Rather than spending so much time on quality assurance pro-cesses in relation to the smaller tasks, the answer could be to accept a degree of subjectivity in the marking at that level and put more time into making quality judgements of the students' best work overall:

> The focus would shift from individual assessments to the overall profile of a student on the basis that a series of marks awarded over a period of time might provide a more accurate assessment of stu-dents. (Bloxham 2009, 216)

This suggests the possibility of a more focused role for external exam-iners, with emphasis placed on making a safe judgement on the basis of the programme-wide Showcase Portfolio.

This approach to assessment could mean re-thinking some of the practices current in many higher education contexts today. It would affect the ways in which the current assessment and feedback processes play out in the round. How then would the assessment and feedback ele-ments need to be orchestrated?

Orchestrating assessment and feedback

The ways in which the pattern of assessment and feedback needs to play out depends on how the 'audiences' are chosen. Enabling students to create some assessment outputs directed at designated audiences can once again involve a variety of approaches, suited to different con-texts. Examples include, ranging from the least to the most radical:

- Tutor nominates an imagined audience for a given task and asks students to write/present *as if* to that audience.

- Students collectively nominate a putative audience for existing assignments, and adjust form and language accordingly in their assignment.
- Individual students select an imagined audience and write/present as if to their nominated audience.
- Students write/present to a targeted online audience, inviting feedback online.
- Students write/present to a real audience, asynchronously (e.g. creating a multi-media package for a company, writing an edited text or resource for a publishing company; writing an academic article for a particular journal).
- Students set up a 'real time' opportunity to engage with an audience, for example student peers, alumni, a local interest group or employers' representatives.

Some of the more radical options might lead to a significant change in the assessment and feedback process cycle we looked at earlier in the chapter, in that audiences may be engaged in co-creating opportunities for both learning and assessment. Feedback would then be built much more authentically and immediately into the activity via dialogue as part of its development, perhaps in the manner of a designer responding to the interests of a client.

This approach allows for a greater emphasis on learning activities involving collaborative work and peer dialogue (see Chapter 8), and on student-tutor dialogue (whether in person or online), than in the traditional assessment cycle. Initial feedback on these assessments, which can include indicative marks or grades so that students know in broad terms how they are progressing, becomes an integral part of the learning process, rather than distanced in time from the learning as is often the case in the traditional sequence.

The sequence of activities starts to change. Students:

1. take a class and/or undertake independent learning (e.g. via a virtual learning environment, through wider reading or experiential learning), which from the start foregrounds the needs and interests of particular audiences;
2. engage in learning through dialogue and collaboration, such that constructive feedback from peers and tutor is built into the activities;
3. discuss assessment criteria as an intrinsic part of these learning activities, using formative peer assessment tasks to develop shared understandings of what is required;

4. orientate themselves towards an external audience and, where possible, work in partnership with representatives of that audience to develop their thinking and gain additional formative feedback;
5. work on the assessment task, in the knowledge that it will make an important contribution to the final Showcase Portfolio, by actively using feedback from a range of sources to inform its development;
6. receive a provisional mark for the task;
7. include the task in the final, curated, Showcase Portfolio at the end of the programme and await holistic, formal assessment of their overall achievement on the programme.

This approach offers an integrated, holistic and developmental approach to assessment, putting more emphasis on learning through dialogue and engagement than on technical assessment processes. The Showcase Portfolio, making a significant contribution to the final level of award, could require some re-working of current institutional practices (including regulations). It would rightly vary in emphasis across different disciplines. But it has the distinct advantage of giving students time to develop their expertise and become acculturated into a given academic and/or professional community before submitting a substantial part of their work. This enables students not only to become competent but also to gain a greater sense of autonomy as they oversee the whole learning journey and consider its relationship to their personal context and future direction of travel.

4 Challenges for departments

Changing approaches to assessment has the potential to change the rhythms and cultures of engagement within and even across departments. A department may start to change, however, by introducing just one or two outward-facing assessments. Over time, a review of the whole shape of the programme could then reform the rhythm of assessment-related activity across the whole length of the programme of study. There is no quick fix for this; programme teams would probably need to look ahead to the next 3–5 year period to see how future students might begin a programme with outward-facing assessments and a programme-level Showcase Portfolio running through its core. Changes may be needed at institutional level, for example with respect to assessment regulations and mechanisms for recording assessments across a whole programme, if the full changes recommended here are to be implemented. But the Connected Curriculum approach *is* about changing the larger direction of travel, for institutions and for the sector.

One valuable way of planning effective changes to curriculum is to work with students or student representatives, along with alumni, to co-create new curriculum design. This can also create a sense of human connection and belonging within a department and institution. We turn to the theme of human connections in Chapter 8, which addresses the final dimension of the Connected Curriculum framework: 'Students connect with each other, across phases and with alumni.'

5 Vignettes of practice

This set of vignettes illustrates ways in which students can learn and be assessed through producing outputs directed at an audience. The first two involve students in creating digital outputs. In the first, students produce digital communications for the public about London on the first year of a History degree at UCL and, in the second, students at the London School of Economics make films about international politics. The third outlines how students at the University of Sheffield produce a business report, and the fourth vignette shows how students at the University of Liverpool Management School undertake research and then report to a task group as part of the university's engagement strategy.

1. Making History: Engaging the public with insights into the history of London in the UCL Department of History through digital outputs

Working in a small team, first-year students on the Making History module produce a presentation, in person and using digital media, explaining the historical significance of an object or place. They are challenged to understand the object or place, contextualise it and tell its story. Why was it created? How has it been used? Has its meaning changed?

Making History encourages students to be self-reflective about History as a discipline and as a practice. New media such as electronic forms of communication, television, films and websites are raising new questions about historical methodologies and the politics of the preservation of historical sources. In response to this, students are asked to focus on historical process and method as much as on producing an historical product. How as a group they arrive at their

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final website and presentation is as important as what they ultimately conclude in response to their chosen research question.

Each website and each final presentation is awarded a single assessment mark, which is shared by each member of the group. Accordingly, each member of the group assumes equal responsibility for ensuring that the project is completed on time and to a high standard. Learning to work effectively as a group is one of the key skills Making History is designed to develop. Students also learn to apply assessment criteria fairly to the work of others on this module, as part of the assessment of the group presentations.

The presentations are aimed at an intelligent, but non-specialist, public audience and involve two or three digital outputs. Whatever students produce should take no longer than 20 minutes to read, listen to or view, but the forms they can use are varied. Examples of digital outputs include a website providing information in an interactive way, a podcast, a video or an interactive map, diagram, or image. Assessment criteria include successfully communicating historical ideas and concepts including, where appropriate and helpful, historiography, to a general audience.

Vignette submitted by Dr Adam Smith, Senior Lecturer in the UCL Department of History.

2. Visual International Politics at London School of Economics

International Relations is in the midst of a 'visual turn', because images play an increasingly important role in shaping international political events and our understanding of them. 'Visual International Politics', a final-year undergraduate course at the London School of Economics, is unique because students don't just study and critique visual media – they make their own films. The course thus has conceptual and practical objectives and so employs pedagogies of metacognition and experiential learning in order to achieve those.

At a conceptual level, students learn how to use a range of theoretical and methodological approaches to interpret photographs, films and other visual media. The course also has practical objectives: it is the only International Relations course that provides practice-based training in documentary filmmaking. Students thus learn to 'think visually' by interpreting images and making films, and there is a demonstrable, mutual benefit to both their textual and visual practices as a result.

In 2015–16, for example, students' ten-minute documentary films addressed such diverse topics as the global politics of beards ('Beard Goggles'), a behind-the-scenes look at London's Russian elite ('Bliny vs. Scones'), and a political ethnography of London's nighttime economy and its workers ('The Night Bus').

Visual International Politics is part of the wider 'Students as Producers' initiative at LSE, which aims to deliver improvements to learning outcomes by diversifying assessment and recognising students as co-creators and co-producers of knowledge. The course receives enthusiastic feedback from students, who value it both for its uniquely critical approach and for providing valuable transferable skills.

Vignette submitted by William A. Callahan, Professor of International Relations and Darren Moon, Senior Learning Technologist, LSE. The students' films can be seen at https://vimeo.com/channels/IR318

3. Enquiry-based assessment in a Business Intelligence module at the University of Sheffield: Developing a Business Report

The final-year undergraduate module in Business Intelligence offered by the University of Sheffield Information School is assessed through an innovative, enquiry-based collaborative business report combined with two pieces of reflective writing, one about their experiences of working as a group and one reflecting on their information literacy development.

The module focuses on the ways in which business people use information and on how external information is used to inform business strategy and create competitive advantage. It can be difficult to understand these information activities in organisations, particularly if students lack work experience. The coursework enables them to understand at a much deeper level the information gathering, evaluation, synthesis and presentation activities that business people undertake.

The collaborative, enquiry-based activity involves students working in small teams to investigate the business information needs of a Business Partner – a 'real life' information problem. I work with University of Sheffield Enterprise to source local business people who want to work with students. Because of this many of the business partners are recent startups, social enterprises or even entrepreneurs with ideas. This messy, unstructured real world enquiry allows students to develop problem-solving skills and provides a bridge from the safe world of academic assignments to the more open and unsure world of business.

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Students form self-selecting groups of three to five members. This flexibility with group size allows students to take control over who they choose to work with; this seems to improve group functionality. In addition, students receive support sessions to discuss group-working protocols, the value of group working for skills development, communication, group roles and positive outcomes from group work.

Students are provided with a very short project brief before they have the opportunity to interview their business partner about their information needs. The experience of meeting business people outside of the context of a job interview is very powerful and many groups go on to produce excellent, well-researched business reports for their partners. The two reflective assignments (20 per cent each of the module mark) mitigate the potentially negative effect of having group work in the final, important year of undergraduate studies. Through the reflective writing students become more aware of their own roles in groups and can more easily identify what they could do in the future to improve communication, collaboration and problem solving. Their information literacy development, a key skill for lifelong learning, becomes explicit through the reflective process. The business report requires students to collaborate on presenting findings to a specific audience, focusing their attention on appropriate modes of communication as well as developing their information literacy.

Submitted by Pamela McKinney, Lecturer, Information School, University of Sheffield.

4. Students on a Sustainability in Business module at the University of Liverpool Management School report to a Task Group

The University of Liverpool Management School runs an innovative module that embeds information and digital literacies through an enquiry-based learning approach. The topic of the module is sustainability in business, a very current issue that demands online research as emerging practices and ideas may not yet appear in the print literature. The module is run as a series of team-based workshops.

There are a number of outcomes from the workshop activities, such as editing a Wikipedia article related to sustainability and providing reports to inform university sustainability activities. This requires the students to develop a high level of information literacy and, key to

this, is the enhancement of their digital literacies; these are closely linked with their academic skill sets and patterns of practice. The students practise advanced search techniques for a variety of search tools and develop skills in managing data, for example through using online referencing tools.

Once data from a variety of sources have been collected, students are shown how to perform methodical analysis using a variety of electronic tools to facilitate critical evaluation. For example, they are exposed to content analysis and thematic analysis, very useful approaches to the critical analysis of a body of literature. These are demonstrated and supported through the use of digital tools such as MindGenius or NVivo. Team members are also encouraged to develop skills in using digital tools for collaboration and facilitation, including tools on our university virtual learning environment and social networking tools such as Facebook and Twitter.

Primary data collection in the form of interviews – a key source of information in the business environment – is an important element in this module. Students have been able to explore issues of interest with leading figures in the corporate sustainability community. Currently students are linking with Planning students from the Department of Geography in a University-wide project on Green Spaces. They perform a management evaluation of the Planning students' proposals to the University Green Space Task Group and then report to this task group as part of the university's engagement strategy. This will necessitate interviewing the Planning students about their reports.

Student engagement in this module has been high. Module and focus group feedback confirmed that students did gain important skills in digital scholarship, group working and reflection in addition to subject-specific skills. A number of students from the module volunteered to become Digital Champions. They acted as peer-learning facilitators to first-year students, advising them on digital tools and strategies for their research-based assignments. This demonstrates the impact of the sustainability module on students' learning and also the confidence they have gained through undertaking research and enquiry and producing outputs for a targeted audience.

Submitted by Simon Snowden, Tünde Varga-Atkins and Emma Thompson from the University of Liverpool. An earlier version of the module is written up as a JISC case study: http://digitalstudent.jisc-involve.org/wp/files/2015/01/DS23-Integrating-digital-literacy-with-enquiry-based-learning.pdf