Chapter 5

Reaching Out: Making Links With Communities

Well-designed research-based assessments can help students to engage with the world beyond higher education and contribute critically to policy decisions. Higher education institutions are part of the wider community and are often funded by and accountable to that community and its representatives, for example, political bodies. Higher education institutions often include in their ‘mission statements’ an aim of reaching out and working in partnership with local communities. Links can be created and strengthened through assessments involving students working with community organisations, such as non-governmental organisations (NGOs) and community groups, government departments, and local and international employers. Community linked assessments can also give students experience of using research to contribute to knowledge building within their community and experience of presenting to and writing for external audiences. This chapter explores the practicalities of setting up assessments which have an external element, liaising with external bodies and designing these assessments. Beginning with a consideration of the idea of authentic assessment, the chapter explores types of inquiry-based learning (IBL) and ways of linking academic research with community involvement through imaginative assessment tasks which aim to develop students as independent researchers.
Communicating with Audiences

Authentic assessment, that is assessment that mirrors practices in work and the community is increasingly used in higher education; for example, scenario-based assessments which require students to respond to professional issues. Scenarios can be designed to mirror professional tasks, requiring groups of students to collaborate to solve an ill-structured problem (Voss and Post 1988), that is, a problem with no correct answer. In solving the task, students combine theoretical knowledge of the subject, understandings of how knowledge is created and communicated within a discipline (Barradell et al. 2018, McCune and Hounsell 2005) with professional skills and so gain a better understanding of the application of theory. As problems to be investigated are ill-structured, student responses can be divergent. Students have an opportunity to explore creative responses to the problem. In some cases, this may lead to creation of new knowledge in the field or profession (e.g. Chang 2005; Chang and Jackson 2007).

One step further to is develop assessment in partnership with external bodies, ensuring that the assessment task will have diverse audiences. This approach to assessment requires careful planning; many practical and quality assurance issues need to be thought through. Traditionally in higher education, the teacher is the audience for students’ assessed work, whether it is a lab report, mathematical calculation, essay or presentation. Involving external bodies can be a motivating factor for students as they can connect their work in higher education with industry, employment and with issues in their own community.

The assessment for this type of task can take a non-traditional form, so rather than essays or lab reports, students may give presentations, write blogs, design multi-media training resources, make videos and write public information leaflets. Students learn to communicate with different audiences. The experience gained from these assessments can be valuable when they leave higher education and apply knowledge to the world beyond (Boud 2000). Boud and Soler define sustainable assessment ‘as a way of rethinking outcomes, curriculum and pedagogy away from a focus on disciplinary knowledge to what students can do in the world’ (2016, 401). Sustainable assessment, and the notion of assessment for learning, position assessment as an integral part of the learning experience, rather than assessment of learning. Sustainable assessment tasks go beyond memorisation and regurgitation of facts, and engage students in complex learning, requiring the application
of theoretical knowledge to formulating and solving professional or community authentic problems. Learners apply knowledge to community or work issues, but this is not about creating ‘worker identities’ (Tennant et al. 2010, 107) or producing students ready for employment. Sustainable assessment has the wider aim of developing students and enabling them to join and better understand their communities, providing them with the knowledge and skills to contribute through active citizenship. The non-governmental organisation Citizens UK (2019), works with the academic community to investigate issues in the local community and campaign for action. Academics work in partnership with Citizens UK and contribute to their campaigns. Students engage with these campaigns and gain a better understanding of their local community and democratic processes through carrying out research work.

Authentic assessment is not unproblematic. Issues can arise when scenarios and problem-based learning (PBL) are set up so that there is a right answer. This can be reassuring for teachers, who are provided with crib sheets and are confident that they have the best possible answer, but can create an inauthentic feel. Lack of external involvement can also lead to inauthenticity. If there is no external involvement in the scenario, e.g. community groups or industry contacts, the assessment can become just another exercise communicating with the teacher. Other issues arise when enthusiastic teachers design a variety of unfamiliar assessment tasks for students; for example, blogs, vlogs, public information leaflets, posters and hyperlinked articles. These can be valid tasks but the sheer variety and lack of familiarity with these genres can create problems. Students may have had no previous experience of making videos or writing for the public. A change in the genre of assessment needs careful preparation; students need practice in the new genre so that they can achieve mastery before being assessed and before their performance is summatively judged. Similarly, teacher assessments of these innovative tasks may be unreliable, because teachers may not have experience of assessing innovative tasks and may not have discussed with colleagues how to assess these tasks or agreed academic standards (see Chapter 6).

Research-Based Learning

Citizenship in our ‘supercomplex’ world (Barnett 2000) involves being able to critique and understand complex issues, recognising the limitations of research findings, understanding to what extent research
can help towards finding solutions and how best to implement and critically evaluate those solutions.

In higher education, many students are studying for entrance to professions such as medicine, law and engineering (Brew 2006); their aim is not to become academics. However, the impact and influence of academic research and ways of thinking and practising (WTP) in the disciplines reaches into all aspects of our professional and personal lives. McCune and Hounsell (2005) argue that WTP describe the breadth of learning that a student might engage in and that might give students insight into the way professionals think and express themselves. For students to effectively influence their professions and communities, they need to be cognizant of established ways of knowing and of ways of creating knowledge within their discipline(s) so that they can engage in knowledge building. In developing this awareness, they are also able to critically evaluate the established ways of knowing and, through critical appraisal, identify shortcomings and dispute current orthodoxy. Students may also understand how to use research findings to explore and resolve complex challenges, which may be professional, personal or societal. This then is the rationale for engaging students in authentic research experiences; to provide opportunities for them to develop the knowledge and skills they need to function effectively in a supercomplex world.

Views of Research-Based Learning

Research-based learning epitomises a shift in ways of thinking about learning; research-based learning places the student at the centre of learning. One of the teacher’s roles entails designing ‘scaffolding’ activities (Bean 2011) to help students acquire the skills and knowledge needed to plan and conduct research.

Research-based learning embraces a wide range of practices, e.g. inquiry-based learning, object-based learning, case studies or scenario based-learning and problem-based learning. Issues raised in the literature are the:

- power relations between students and teacher
- degree of support/scaffolding required
- openness of the task set
- connection to professional practice
- authenticity of the task
- range of genres and audience for the final product(s)
- focus on knowledge building or building generic research skills.


Brew views research-based learning as a ‘shared encounter between individual human beings’ (2006, 14). She discusses the power dynamic between student and teacher and the danger of the teacher imposing their views and opinions on the less experienced ‘submissive’ student. A key principle for Brew is that teacher and student should engage in research-based learning as equal partners. Chang’s (2005) work illustrates how this can be done. His students engage in research in an area that he is not expert in and, through the use of an ‘inheritance mechanism’ – a way of handing on research data and analysis to the next student cohort, they soon become expert. His role is to act as a guide and facilitator, enabling students to progress in their research. Chang explains, ‘In the exam I include references to other students’ work. So they come to appreciate each other as experts’ (Brew 2006, 176).

Brew’s model of the relationship between research and teaching is dynamic and focused on teachers and students interacting as learners and ‘knowledge builders’ (Brew 2006, 31), which she terms ‘inclusive scholarly knowledge building communities’. Participants are allowed to be involved in research activity and there is an equal partnership between participants. This can be difficult to achieve as teachers have more ‘academic capital’ than students, so it is important to strive towards equality. Brew explains that ‘inclusive’ means ‘democracy in the sense in which Dewey used the term, where education is about nurturing human growth and development’ (Brew 2006, 34).

**Inquiry-Based Learning**

Levy and Petrulis’s (2012) view of ‘inquiry-based learning’ draws on Brew’s work. In a small-scale, qualitative study of first year students’ experiences of inquiry-based learning, they identified different dimensions of experiences from ‘identifying’ at an early stage in the programme, where students work on investigations framed by the teacher and explore existing knowledge, to ‘authoring’ where students generate their questions and can be involved in original research and knowledge building. They argue there is evidence for providing more guided forms of inquiry-based learning at the start of a programme, while more open
‘authoring’ tasks that empower students to develop their own research agendas can be used later (Levy and Petrulis 2012, 98). Their model can be used for designing research tasks, helping teachers to identify levels of support to provide.

Aditomo et al. (2013) investigated the design of inquiry-based learning tasks. They collected data from 224 academics in three Australian universities, one from each ‘type […] “Sandstones” (most research intensive), “Gumtrees” and “Unitechs” (least research intensive)’ (Aditomo et al. 2013, 1244). They asked the teachers at these universities to send examples of their tasks and objectives. They investigated whether academic discipline or other contextual factors influenced tasks types and objectives (Aditomo et al. 2013, 1243).

They identified a range of task types and distinguished between a focus on content and a focus on practice, that is, the kinds of skills students need to develop. ‘Use-oriented’ tasks have practical applications and aim to develop professional knowledge and skills. They identified four types of use-oriented task, namely:

- roleplaying (2.3 per cent)
- enactment of practice (28.8 per cent) – provide service to clients, e.g. in medicine (clinical consultations), education, accounting etc.
- applied research similar to simplified research but with a practical application (9.3 per cent)
- simulated applied research (8.8 per cent).

(N.B.: figures in brackets relate to the percentage of tasks.)

The remaining tasks were categorised as non use-oriented. Non use-oriented tasks were designed to develop knowledge of content and categorised as:

- discussion-based inquiry involving online or face-to-face discussion (5.6 per cent)
- literature-based inquiry (6 per cent) involving a review of the literature with no data collection
- simplified research with pre-specified research questions and methods/analysis provided (27.4 per cent)
- scholarly research (10.7 per cent), requiring formulation of questions and collection and analysis of data.
Applied research, simulated applied research and simplified research tasks focused on ‘the use and acquisition of disciplinary concepts’ and guided students to use particular theories (Aditomo et al. 2013, 1250). Scholarly research typically required students to communicate findings to external audiences, at least external to the class.

Examples of Inquiry-Based Learning Tasks

Here are examples of some inquiry-based learning task types (all from Aditomo et al. 2013); no difference was found between types of university and type of task set.

**Scholarly Research**

The students are to obtain a data set, ask some statistically based questions (their choice) about the data and use statistical methods to answer their questions. The students are to summarise their work in a short report. Students may work in teams of up to three students. (Undergraduate, statistics, 210 students) (Aditomo et al. 2013, 1246)

**Simplified Research**

Students are given three sets of DNA sequences and need to use the computational tools and databases they have learnt about to discover the respective functions of the proteins. They are not told which tools to use, and the third of the sequences requires some detective work (I do give a hint). (Undergraduate, biomedicine) (Aditomo et al. 2013, 1246)

**Literature-Based Inquiry**

‘Asked to undertake a systematic review on a question of their choice.’ (Undergraduate, psychology, 39 students) (Aditomo et al. 2013, 1246)

**Applied Research**

[Students] had to research the issues surrounding transport, energy, food and waste in residential dwellings in NSW and then work out how they could deliver a ‘car free household’, a ‘zero waste
household’ or a ‘food producing household’. They worked in teams following a process of research, synthesis and communication. When they had come up with a range of design solutions, they had to pitch these ideas as if to a funding body, seeking start-up funding for further development. (Undergraduate, engineering, 580 students) (Aditomo et al. 2013, 1247)

**Simulated Applied Research**

Students are given several case scenarios related to professional practice, ethical behaviour and clinical reasoning during practicums. Students discuss these case scenarios in small groups and use a problem solving framework to plan appropriate action or intervention related to the given scenario. Students feedback and discuss their findings and plans for intervention with the large group. (Undergraduate, occupational therapy, 75 students) (Aditomo et al. 2013, 1248)

**Role Playing**

After the two hour lecture we held a workshop for an hour where the class of 35 was divided into groups of three and each group was given six scenarios to work through. The scenarios were worked through one at a time with one student being the patient presenting a prescription, another being the pharmacist dispensing the prescription and the third student observing. Then the next student would have the opportunity of being the ‘pharmacist’ and so on until they had each been the pharmacist twice, the patient twice and observed twice. (Postgraduate, pharmacy, 35 students) (Aditomo et al. 2013, 1248)

From this data, Aditomo et al. (2013), developed a typology of IBL tasks. Many of the inquiry-based learning tasks collected in this study fell into Levy and Petrulis’ (2012) category of identifying, that is, exploring existing knowledge. Scholarly research tasks, which account for 10.7 per cent of the tasks, were the closest to authoring tasks, involving knowledge building. The authors point out that concerns about inquiry-based learning activities lacking authenticity seem valid, particularly when the task is not open-ended but has a right answer.
Object-Based Learning (OBL)

One type of inquiry-based learning task that requires special mention is object-based learning, pioneered by university museums and collections (Chatterjee and Hannan 2016; Hannan et al. 2013; Duhs 2010; Kador et al. 2018; Morgan 2018). Object-based learning can offer the opportunity for knowledge building and scholarly research. It is not a new pedagogy; objects in museum collections were extensively used in teaching before the twentieth century (Kador et al. 2018, 159). Objects can be from curated collections or from elsewhere and can be used to enhance learning in any discipline. It is ‘a pedagogy that prioritises facilitated interaction with “material culture” to enhance critical thinking and key skills’ (Kador et al. 2018, 158). ‘Material culture’ is a broad term that includes everyday objects.

Chatterjee and Hannan (2016) emphasise the importance of using the senses, especially touch to make sense of an object. Looking closely at objects and touching them can bring to life theoretical concepts and increase student understanding (Kador et al. 2018). The mystery specimen activity (see below) engages students with a mystery object. They use all their senses, especially touch, sight and smell, to explore the origin and use of the object. Object-based learning can be an opportunity for both identifying inquiry-based learning and, in the case of more complex investigations, authoring inquiry-based learning as students are involved in knowledge building and constructing the histories of unknown objects.

Case Study: Mystery Specimen

Level – third and fourth year undergraduate (but also used in master’s programmes and in a range of modules)
Discipline – biology and zoology, but could be adapted to many disciplines (see below)
Module – used in a range of modules, e.g. Vertebrate Life and Evolution in the Department of Genetics Evolution and Environment, UCL
Cohort – a wide range, most from biological sciences but also some from geography, anthropology or human sciences. Both home and international students
Learning approach – object-based learning, active learning
The ‘mystery specimen’ involves students in activities that develop disciplinary thinking and mirror disciplinary research. Students work in the Grant Museum of Zoology, interacting with museum staff who facilitate parts of the module. They are each given an unidentified vertebrate specimen and, over a term (a three-month period), they are required to identify the specimen.

The specimens all have museum labels, descriptions and classifications removed and can be anything from bone to skin. The student’s task is to identify which part of the animal the specimen comes from. They must identify the ‘correct class, order, family, genus or species’ (Kador et al. 2018, 163). Most students manage to identify which group of vertebrate the specimen comes from (e.g. bird, fish etc.). Their research helps them identify:

- the material of the specimen
- whether the specimen is complete or partial
- what part of the animal the specimen comes from.

It can be more difficult for students to identify:

- whether the specimen is from a male or female animal
- the age of the animal (adult or juvenile)
- whether any part of the specimen has been altered
- any sign of pathology in the specimen.

Students are required to engage with disciplinary literature and to develop disciplinary thinking and research skills. It is not possible to identify the specimen from internet searches. Students are supported in their learning by a series of teaching sessions. They learn about ways of looking at specimens; this involves detailed anatomical observations and consulting drawings and photographs. They interact with museum staff, for example, they can ask for additional comparable material to help them identify their specimen. They can explore other museums and consult relevant literature. In this way, they are developing the research skills required for specimen-based research.

Assessment of the module draws on the research skills that students have acquired and involves writing an article for the scientific journal, Trends in Ecology and Evolution, following the journal’s author guidelines. The assessment gives students practice in communicating with an external audience using appropriate conventions. In the article, students are expected to propose further research work that would need
to be carried out to confirm their identification and reflect on which scientific techniques would give a more accurate identification, for example DNA sampling or micro-CT scanning. The articles are assessed on the quality of the research work, not on whether the identification of the vertebrate is correct.

This work also benefits the Grant Museum as student identifications are compared with descriptions in the Museum’s catalogue and, in some instances, this has led to discoveries that specimens have been misidentified. These misidentified specimens are now on display in the museum, celebrating the students’ detective work.

Students’ perceptions of object-based learning was investigated in a survey of 154 students from a range of disciplines; the authors reported that 61 per cent of students agreed that object-based learning is more effective than listening to a lecture and valued object-based learning because it is visual, exciting, has practical application, and is good for developing teamwork, communication and observation skills (Hannan et al. 2013).

Preparation

This activity is an example of an authoring activity and, as such, assumes considerable knowledge of research skills and academic writing. Students will need to have completed activities previously in order to be familiar with the research skills and knowledge needed for this kind of object-based learning. Identifying activities such as ‘Meet the Researcher’ (see Chapter 2) will introduce them to research areas and literature. In addition to knowledge and research skills, they will need practice in journal article writing; this is a high-level skill which will need to be developed throughout the programme of study. (See Chapter 4 for a discussion on planning assessment across a programme.)

Adaptation: Use in Other Disciplines/at Other Levels

The activity could be simplified for first year students by asking students to work in groups and blog about their mystery specimen. Other objects such as artwork and historical artefacts can be used for object-based learning in a range of disciplines.
Further Reading

For a more detailed explanation of the mystery specimen, and more case studies of object-based learning, see the two titles below.


Disciplinary Knowledge

Ashwin et al.’s (2017) study of undergraduate dissertations, highlights what students gain from assessments that focus on disciplinary knowledge (producing and authoring in Levy and Petrulis’ 2012 terms) rather than generic research skills. They conclude:

… it seems that students’ engagement with disciplinary knowledge through research is a key mechanism for the subject-based benefits that are provided through research-based learning. The implications of this are that these benefits are not likely to be derived from students doing any form of research. Unless they see their disciplinary ways of thinking and practising (McCune and Entwistle 2011; McCune and Hounsell 2005) as providing a way of answering their questions, engagement in inquiry-based learning is unlikely to lead to changes in students’ understanding of academic knowledge. (Ashwin et al. 2017, 528)

Advantages of Non-Traditional Assessments for Students

Traditional forms of assessments in higher education, such as essays and multiple-choice questions, which do not involve students in research-based learning or link to an external context are limited. The advantages
of the non-traditional assessments described in this chapter are described here (adapted from UNSW 2019).

- Learning is linked to a context beyond the higher education institution. In this context, students have the opportunity to apply knowledge and skills or develop new knowledge or skills.
- Assessment can be more holistic and can help students bring together learning from a range of modules and link theoretical knowledge and professional knowledge.
- Assessments can align more with the kind of activity students would do outside of the higher education institution, either as employees or citizens. Students can see the benefit of the assessment; it appears more valid.
- Research-based learning that focuses on knowledge building can shift the power balance in learning and assessment (Brew 2006). Students may explore areas that are unfamiliar to teachers. Students can become ‘experts’ in those areas (see Chang 2005).
- Research-based learning can enhance employability; employers like to know that students can apply knowledge, work in teams and communicate with the public.

Advantages of Research-Based Learning for Teachers

Teachers can benefit from research-based learning in the following ways (adapted from UNSW 2019).

- Teachers often comment that students do not make links between modules. Research-based learning assessments can help students make links between modules so that they develop a more holistic view of their programme.
- Research-based learning can keep teachers up-to-date with industry, professional and community developments and practices. Students may explore new areas and add to areas studied, helping teachers to expand their knowledge; in Levy and Petrulis’ terms (2012) students are engaged in ‘authoring’ activities. Teachers may come to see students as experts and facilitate publication of their work (Chang 2005).
- Research-based learning can help students develop as independent learners.
Disadvantages and Challenges of Research-Based Learning

The disadvantages of research-based learning (adapted from UNSW 2019) are as follows.

- Unfamiliar genres and tasks. Some students may be disadvantaged if research-based learning assessments require unfamiliar genres, e.g. a video, case study report, maths lesson plan and resources, public information leaflet or academic article/book chapter. If students are not prepared, they can flounder with new ways of studying and unfamiliar genres. It is important to plan preparation activities and give students time to practise new genres. Build in lots of identifying activities (Levy and Petrulis 2012) at the start of the programme.

- Time commitment. Research-based learning can take much longer than traditional assessments and there is a limit to what can be explored in a short module or even one year. Chang's (2005) inheritance mechanism (see case study below) enables handover of work to the next cohort, so that students can quickly pick up and develop their peers’ work.

- Accessibility. If students are required to visit external sites, these need to be fully accessible and safe environments. Timing of visits should respect religious holidays (see Chapter 9 for more on inclusive assessments).

With these considerations in mind, teachers need to think about the increased time commitment needed to develop and plan links with community groups or health care providers or industry. Wills (2014) suggests that the higher education institution should have pre-existing links with community organisations and should be contributing to work in their communities, ‘developing long lasting, reciprocal relationships’. She comments on the value of fieldwork for geography students: 'In our experience at Queen Mary, geographical field study is a vehicle for learning about the ways in which local institutions and their people work together, the power of relationships to effect political change and the dynamics of running campaigns’ (Wills 2014, 281).

The value of fieldwork in the community is that students learn a wider range of skills. Wills (2014) worked with Citizens UK (formerly known as London Citizens). Her students carried out research in a multi-cultural inner-city area with an non-governmental organisation that is
working ‘across divisions of faith, ethnicity, gender and age through a focus on working together for the common good of the city’ (Wills 2014, 281). Students developed a shared project with Citizens UK members and learnt, ‘… a variety of other skills such as, in our case, research design, planning and methodology, team working, time management, presentation and professionalism’ (Wills 2014, 281). Moreover, as some home students lived in the multicultural inner city, they could bring their knowledge and understanding of community issues to their research. Interestingly, this local knowledge can shift the power dynamic between students and teacher; teachers may have more ‘academic capital’ (Brew 2006, 31) than students, but students may be more cognisant of local issues and can use this knowledge in interpreting research data.

In creating and maintaining links with external partners, it is important to delineate a clear role for them. The role of the external partner in the assessment process needs to be specified and in line with institutional policies and regulations. Other considerations, discussed in subsequent chapters, are grading of new forms of assessment; for example, video assignments and assignments that include web design. Teachers need to think through what degree of expertise in video etc. is expected. If students are involved in designing assessments or involved in peer assessment, they need to be competent to carry out these roles. Chapter 7 discusses ways of preparing students for peer and collaborative assessments.

**Overcoming Challenges**

The challenges listed above can be overcome through careful preparation of both students and external partners. The roles of all parties need to be clearly defined. In research-based learning, the teacher’s role changes, and s/he becomes a mentor, guiding students in their discovery, advising on time scales and research methodology. The teacher ensures groups do not take on too much and are realistic about what they can achieve. The teacher also ensures that external partners have realistic expectations of student outputs. As with all assessments, it is important to plan research-based learning activities across the programme (see Chapter 4 on programme design). The assessment may be synoptic, requiring students to draw on learning from several modules and address concepts central to the discipline(s); for example, a final year dissertation project.

Teachers should ensure that students have practice in ‘bite size’ bits of the research-based learning assessment; for example if the assessment involves collecting data and writing a briefing report for an external
audience, ensure that students have a task in the first term of the first year that involves data collection in groups, and in the second term, build on this with a task that requires more data collection and analysis. Students should be required to write a short version of a briefing report and present to an external audience, so that they have practice in the genre and content before they tackle a summatively assessed briefing report. When research-based learning assessments are set, opportunities for discussion of early plans (e.g. group presentations) and feedback on drafts should be provided.

External partners can be an invaluable source of information. Involving them in the design of the assessment can help ensure authenticity, for example by developing a task that mirrors professional practices. Having an external audience, someone who is steeped in the professional community of practice, can add an extra dimension to student learning and help focus the task. For students, additional learning may occur as they interact with members of the external community. For the teacher, much time may be spent in making contact, designing a valid assessment task and negotiating external involvement in line with institutional assessment policies; check the quality assurance guidelines for your institution.

Case Study: Authoring in the Physical Sciences

Module title – topics in the history of the physical sciences
Level – undergraduate
Cohort – home and international students
Learning approach – research-based learning, ‘directed community model’ (Chang 2005, 389)
What’s of interest – students develop as experts and cite each other’s work, pass work on to incoming students through an ‘inheritance mechanism’ (Chang 2005, 391) and publish collaborative work.

Chang’s way of working with students is fascinating. He has created a ‘directed community’ of student researchers, engaged in knowledge building and creating original work that has been published in a collected book. Student assessment has become a learning opportunity for Chang himself, as his students research areas in which he is not an expert. His role is to guide and facilitate student research.

Chang felt frustrated that the excellent quality of work his students were producing could not be published and thus reach a wider audience. A single module did not allow students enough time to create publishable
work that could be seen as contributing to research and building knowledge. Student research projects needed to be developed over a longer period of time, so he created the idea of a 'directed community' of students working together and sharing work through an 'inheritance mechanism' (Chang 2005, 391).

Students work on a theme that is flexible enough to accommodate groups of students over a period of years; the chosen theme was 'history of the chemical element chlorine' (Chang 2005, 388). Each student has an individual project but all projects are connected to the common theme of the history of chlorine. Students carefully document their work, creating records that are passed on to student cohorts in subsequent years. Over a period of four years, the data collected and work done by students contributes to knowledge building in the field.

Chang describes his approach as a ‘directed community model’ of research where students are involved in working independently on their own research projects, supported by the teacher and their peers. The teacher introduces them to ways of thinking and practising in the discipline (Entwistle 2005), and students are guided to make contact with experts in their topics. Use of their predecessors’ work quickly introduces them to ways of working and they learn to cite each other’s work and refine and develop their predecessors’ work. This ‘inheritance mechanism’ (Chang 2005, 391), inheriting work from previous students, allows students to make further progress with the research and reach a publishable standard. Students choose whether to make their work available to the next cohort; only one student had opted not to do this. In the published book (Chang and Jackson 2007), all students who have contributed to the work are listed as authors.

Assessment

The module is assessed through an essay and exam. Students submit with their essay all their research records, e.g. annotated bibliography, reading notes, literature searches, photocopies of materials, drafts, work plans and correspondence (Chang 2005, 391). Inheriting this wealth of material enables students to build on previous work and also to learn how to carry out research. In addition to the essay, students take an exam answering questions on their peers’ work and writing an essay about the research process. Chang (2005) points out that students in this module achieve higher grades compared to the other modules they take on the programme. He has received enthusiastic reviews from students about their experiences of learning on this module.
References


Follow-Up

Reading


For an engaging account of one teacher’s experience of introducing research-based learning, read Hasok Chang’s ‘Turning an Undergraduate Class into a Professional Research Community’, Teaching in Higher Education 10, no. 3 (2005): 387–94.

Investigating Your Practice

Use the advice in the UNSW (2019) website to design a new research-based learning activity for your programme or to review an existing activity. Work with students and colleagues to identify issues and areas for change. If there is no ‘inheritance mechanism’ (Chang 2005) consider whether it would be beneficial to introduce one. An inheritance mechanism can ensure that students are involved in knowledge building in the discipline and work as a community to develop an area of research over a period of years.

Consider ways of introducing students to local democracy within the research-based learning activity, working on shared research with community groups. This can introduce students to democratic politics, a much wider demographic and to local activism, teaching them skills for citizenship (see Wills 2014).