

## Title of case study

Authentic assessment in a non-vocational discipline: consultancy-led assessment in Geography and Environmental Science

## Staff Lead

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## Name of course and module (if applicable) case study took place within

ENVS217 Catchment Hydrology, ENVS238 Soils, Slopes and the Environment, and ENVS285 Environmental Science Field Class

## Please briefly describe the activity undertaken for the case study

I designed three modules that deliver training in the knowledge and skills required to work in environmental regulation, management and consultancy. These modules provide our undergraduates with an advanced awareness of the expectations of employers in this popular area of careers for Geographers and Environmental Scientists. At the heart of this training has been authentic assessment that has enabled students to demonstrate and develop these attributes in field, laboratory and computer practicals and consultancy reports that mimic real-life practices carried out by professionals. In the non-vocational discipline of Geography and Environmental Science these assessments have been recognised as innovative teaching practice by students, external examiners, and the International Association for Hydro-Environment Engineering and Research through an invitation to convene a joint academic-practitioners teaching workshop.

## How was the activity implemented?

Specifically, I designed the following authentic assessments:

**ENVS217 Catchment Hydrology:** The module provides 'hands-on' experience of modelling hydrological systems, with an emphasis on applied learning. Foundation lectures are supported by three one-day long computer practicals that develop themes in more detail, and develop the key observational, analytical and modelling skills required by professional hydrologists. Each practical is assessed through a consultancy report that examines their

ability to analyse a problem, communicate their findings to a client and provide feasible recommendations. The three reports involve the students:

1. Acting as a hydrology consultant for United Utilities Water Company and using an industry-standard modelling technique to evaluate whether a dam can withstand an extreme storm event and thus comply with current safety standards outlined in the UK Flood and Water Management Act 2010. Students are then required to evaluate the outcomes of the model and make necessary recommendations to United Utilities on compliance.
2. Acting as a flooding consultant for the planning department of Lancashire County Council over a proposed residential development in a flood zone. Students are required to use industry GIS software to identify assets at risk at different flood magnitudes and identify an alternative location in a low-risk flood zone that minimises loss of high quality agricultural land.
3. Acting as a consultant for the Environment Agency and using a practitioner's model to identify UK lakes at risk of pollution and eutrophication and the reasons why. Once identified, students are required to make recommendations to the Environment Agency on how best to manage catchment land-use to improve lake water quality.

**ENVS238 Soils, Slopes and the Environment:** The module is centred on students working as a group and forming a geotechnical consultancy. Acting as consultants to the Environment Agency, students are assessed through a consultancy report in which they are required to outline why landslides are occurring at Thurstaston, Wirral and recommend a range of intervention methods, along with their associated benefits and costs. Thus, the students are assessed on their ability to work effectively as a team (a key skill in a consultancy) and their ability to provide a client-facing report. This assessment is built upon vocational-related training in site observation, soil sampling and testing in a field class, and in laboratory soil sample analysis using industry-standard techniques in three one-day long practicals.

**ENVS285 Environmental Science Field Class:** During a week-long field class in the Peak District National Park, working in groups, students must identify and analyse an environmental problem in the Park, such as soil erosion and air and water pollution. Students are provided with training in key professional skills in site identification, field sampling techniques, and on laboratory techniques for testing samples. They are assessed in three ways:

1. Through a group presentation to invited stakeholders within the National Park, assessing their ability to provide client-facing presentations.
2. A report to one of these stakeholders, assessing their ability to outline their findings at the correct level, particularly the severity of the problem in relation to other parts of the UK, and a set of feasible recommendations.
3. A field notebook, assessing their ability to produce a log that could be used as an acceptable form of evidence in court in the case of a breach of UK environmental law.

## Has this activity improved programme provision and student experience, if so how?

My authentic assessments have led to excellent student experience, evidenced by module feedback scores: (i) the three modules have consistently scored overall satisfaction over 4.5; (ii) ENVS217 is consistently the highest performer within the programme, receiving special mention for innovative assessment in two Examiners reports; (iii) overall satisfaction in ENVS238 jumped from 3.7 to 4.6 when authentic assessment was introduced.

Student feedback comments reveal the assessments have:

1. Enhanced learning and deepened understanding:
  - “The reports are a genuine achievement ...I felt I was actually learning something at each step of the process and never felt like I wanted to give up or 'do it later” (ENVS217)
  - “[Assessments] were extremely interesting ways of applying knowledge” (ENVS217)
  - “Practicals were innovative ...and allowed a more effective learning technique, learning whilst doing” (ENVS217)
  - “The combination of practicals and lectures help me deepen understanding of related theories and learn their application in real situations” (ENVS217)
2. Equipped students with professional competencies and skills:
  - “I genuinely think that this is the best module I've experienced at university. The teaching, the coursework and the feedback mechanisms have all been flawless ...I didn't expect the coursework to be as career-focused as it was. I think this has been one of the major bonuses of the module because the scenarios all require different ways of thinking, different skills and different theory. Personally I know I have gained much much more from this approach than I ever would've gained through the traditional route of exams” (ENVS217)
  - “A particular strength was the ...opportunity to plan, conduct and report on a practical investigation” (ENVS285)
  - “The report writing was helpful, as it provided practice in succinctly addressing an environmental investigation” (ENVS238)
3. Provided a stimulating learning experience, encouraging students towards environmentally-facing careers
  - “I think other modules could learn a lot from the way this module is structured and organised, and the way it is assessed. This has been a really enjoyable and enlightening module which makes me want to pursue hydrology further” (ENVS217)
  - “My favourite module of this semester and I really enjoyed it!!!” (ENVS238)
  - “Really enjoyed the module” (ENVS285)

## Did you experience any challenges in implementation, if so how did you overcome these?

The challenges were four-fold:

1. Science versus consultancy: Ensuring students were aware of the difference between science and consultancy. An important aspect was making students understand client expectations and how this affects the manner in which methods, results and their implications are communicated. I found providing students with example consultancy reports and using different assessment types (reports, presentations and logs) made the range of expectations clear.
2. Skills training: Linked to the challenge above; in our discipline we provide academic and scientific skills but no training in the development of consultancy skills. Thus, this is an area where our discipline could learn from more vocational subjects in how they deliver this training, such as in Engineering, Architecture and Management.
3. Group work: This has two aspects. First, consultancy involves working in teams so I faced the usual challenges of student concerns over uneven contribution, conflict between group members and ineffective communication. I tried various approaches, including randomly allocating groups, letting students choose their own groups and peer assessment (WebPA). Ultimately the greatest benefit came from explaining to students that these challenges mimic exactly those found in the workplace and that developing group resolution skills is an important part of learning to become a consultant. Second, these learning activities are delivered by module teams and have required a change in teaching delivery. For example, using less lectures and delivering multiple one-day long practicals, equating to an overall increase in contact time. I have fortunately been supported by module teams who believed in this approach, and were willing to change their practice.
4. Stakeholder engagement: In our non-vocational subject we have less engagement with consultancies and stakeholders than vocational subjects. For example, we do not have the same level of formal education relationships with professionals, such as through Industry Advisory Boards. This engagement is paramount for identifying case studies, understanding the latest field, laboratory and modelling approaches, obtaining data, and for keeping up with the latest trends to ensure the learning activities remain up-to-date and relevant. Our discipline could learn from more vocational subjects on how to develop and formalise educational relationships with professionals.

## Which Liverpool University Hallmark(s) and Attribute(s) does this case study relate?

<b>Research-connected Teaching</b>	<b>X</b>
<b>Active Learning</b>	<b>X</b>
<b>Authentic Assessment</b>	<b>X</b>
<b>Confidence</b>	<b>X</b>
<b>Digital Fluency</b>	<b>X</b>
<b>Global Citizenship</b>	

## How does this case study relate to the Hallmarks and Attributes you have selected?

The assessments, and associated learning activities, meet all three Liverpool Hallmarks in the 2026 Education Strategy Vision:

### **Authentic Assessment**

The assignments require students to think, behave and act like practitioners.

### **Active Learning**

(i) integration of active learning techniques, including field, laboratory and computer practicals, resulting in students applying skills, knowledge and understanding; and (ii) creating opportunities for students to work actively individually and in groups.

### **Research-connected Teaching**

(i) research-orientated learning, where students develop research skills and techniques through problem solving; (ii) research-based learning where students learn to use these skills to tackle different stages of an environmental problem; and (iii) research-led learning, where students in ENVS238 identify an environmental problem to investigate.

Other associated indirect benefits relate to the following Liverpool Attributes:

### **Confidence**

The use of one-day long practicals, and the requirement for students to successfully complete exercises by the end of the day, provides time for students to reflect and review their work, receive formative feedback and learn from their mistakes, improving their resilience. Through using practices that mimic those in the workplace, students are also able to recognise their personal attributes in this career area and have advanced awareness of employer expectations.

### **Digital Fluency**

Students are required to use industry-standard simulation software to investigate environmental problems, to think critically about their accuracy and use the findings to make balanced recommendations to stakeholders.

## How could this case study be transferred to other disciplines?

The approach of using active learning and research-connected teaching that mimics professional practices, in combination with assessments that relate to the communication processes used by consultancies, is transferable to other disciplines.

## If someone else were to implement the activity within your case study what advice would you give them?

1. Carefully explain to students how the module will be different, why different approaches will be taken and how they will benefit in terms of both their understanding of the subject and in the development of employability skills.

2. Find a module team who are willing to change their education practice and take some risks!
3. Engage with consultancies and external stakeholders who are willing to share case studies and have an interest in student learning.



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