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EDUCATION AND TRAINING IN CONSERVATION

Balancing accountable assessment with holistic professional practice

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ABSTRACT

Trends in the management of education and demands from students for clarity in assessment resulted in the grading of course work being extensively articulated and described. Students rightly expect to know what they will be marked on and what constitutes work of an appropriate level. This can lead to the disarticulation of a topic into tiny graded fragments that no longer equate to a 'whole' professional experience. This paper looks at changes to the assessment of practical conservation in Cardiff University that attempt to offer an assessment of conservation as a complete professional activity whilst respecting the student and administrative demands for clarity and accountability.

INTRODUCTION

In the UK, feedback from the National Student Survey (HEFCE 2016) reports students as least satisfied with assessment and feedback. This has resulted in local initiatives such as the Cardiff University Assessment and Feedback Project to review and improve practice (Cardiff University 2016). These improvements generate marking schemes that set consistent standards for issues such as the clarity and structure of writing, presentation and referencing, the awareness of literature and ability to research data. These undoubtedly essential academic values are needed by students to understand what is required from them in forms of assessment such as essays and exams, but although they indicate levels of attainment, they are not helpful for students seeking guidance of standards in conservation practice. A marking scheme for conservation must be cognisant of any institutional marking framework and must complement it with guidance that identifies conservation specific levels.

Assessment is a vital part of student learning (Ramsden 1992). There has been an increased emphasis on clarity of assessment standards, resulting in the introduction of criteria-referenced marking frameworks throughout university education (Ecclestone 2001). Marking criteria, although appearing to offer a solution to the perception of inconsistency in marking, can still have the potential for both staff and students to offer multiple interpretations of each criterion and grade (Webster et al. 2000). Studies have shown that the provision of explicit criteria and standards alone is not enough to improve shared understanding of 'useful knowledge'. Time needs to be spent by tutors discussing with students the meaning of the criteria terms and grade definitions (Rust et al. 2003).

A conservation professional will recognise a skill set and approach in a fellow conservator that generates confidence that a practitioner is competent and reliable. In our teaching, we often find ourselves describing a student as having a good 'touch' for conservation. This recognisable quality can be hard to equate to a marking metric, especially one that breaks down all of the attributes of conservation into individual elements. Baumard (1999, 194) points to the importance of this tacit knowledge, arguing that it can be 'crushed or stubbed out by an over-emphasis on explicit knowledge'. To effectively communicate a meaningful knowledge of assessment and standards, a combination of both explicit and tacit transfer processes is

Table 1. Original breakdown of the skills and attributes sought from students in their practical work

Core skills	Investigative powers
	Background research
	Treatment rationale
	Ethics
	Insight and new ideas
Practical skills	Theory into practice
	Quality of practical work
	Manual skills
	Aesthetics
	Handling objects
Project book	Presentation
	Structure
	Clarity of expression
	Treatment procedure
Organisational skills	Work structure
	Work temperament
	Rate of work
	Punctuality
Good practice	Safety & COSHH
	Tidiness and lab duty
	Equipment care
	Security

required (O'Donovan et. al. 2004). This paper discusses the rationale behind the development of a new marking scheme introduced from 2016.

PREVIOUS PRACTICE

In the past, academics at Cardiff University have offered a breakdown of attributes sought from students in their practical work (Watkinson and Stevenson 1996) (Table 1), and this has provided an effective framework to guide practical assessment for two decades. In recent years, the demands from students have been for greater clarification on what makes a pass / merit / distinction level outcome for specific attributes such as 'Manual skills' or 'Ethics' identified in the grading structure. The more traditionally academic skills map easily onto standard practice levels but others, such as 'Insight and new ideas', are harder to map. Staff have felt increasingly uncomfortable grading against all of the headings and sub-headings described and conservation projects were being skewed to supply evidence against the marking criteria. The holistic ability to assess an object, define and deliver a conservation treatment, and evaluate the outcome was being disarticulated and therefore devalued.

PROBLEM FROM THE STUDENT PERSPECTIVE

Students at Cardiff University maintain a reflective learning log of their laboratory practice, known as Project Note Book (PNB), which offers an open format in which they can record their evolving thinking and reflect on their progress (Manti, Henderson and Watkinson 2011). Anxious to deliver all that is required of them and faced with an extensive list of criteria, students have reported their unease about how to record their conservation work. There has been an increase in requests for specific guidance on how to correlate the marking criteria with the conservation project, with students seeking a rigid formula to describe all aspects of conservation with the same structure.

PROBLEM: CONSERVATION AS STEPS OR AS A WHOLE

Real conservation projects are diverse. For some, a significance assessment is vital to making a decision about repair and replacement; for others, analysis is needed to determine the composition of the old adhesive and remove it; and in others, ethical evaluation of the degree of intervention may be matched to the planned future use. Whilst it is possible to describe the components of conservation, it is impossible to describe uniformly the sequence and emphasis of each aspect for all treatments. To offer a specific framework to describe all conservation practice that all student projects follow is restrictive and counterproductive to reflective practice.

Although some organisations represent conservation as a series of steps, teaching staff at Cardiff University aim to avoid such a breakdown in all but the first encounters with conservation. Step diagrams and flowcharts imply a fixed and formal linear decision-making process, which is not how a skilled decision maker operates (Henderson and Waller 2016). While working stepwise is appropriate for novices, it is not desirable that this be crystallised into a rigid thinking system. Therefore, a more

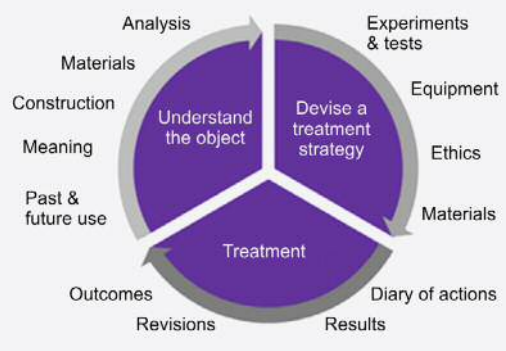

Figure 1. Phases of conservation and associated activities

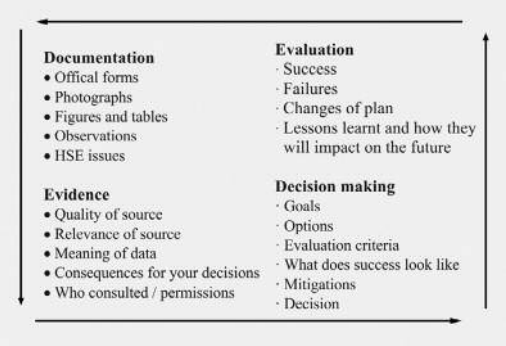

Figure 2. Core attributes for conservation work

iterative approach was developed to describe the nature of conservation for assessment.

PROPOSAL

A marking scheme is required that is both detailed and comprehensive, representing the scope of conservation. However, this must not become a mandate for all projects to operate in an identical way. The challenge is offering a fair and accountable scheme for a real world conservation problem where the solution is balanced according to the needs of the users and possibilities of the object rather than the requirements of a marking scheme.

The resultant scheme developed for the assessment of practical project modules shows the conservation process as an iterative one with three phases: understanding the object, devising a treatment strategy and performing the treatment (Figure 1). These phases describe what conservators do whether carrying out a preventive or analytical operation, or a full intervention. Around these functions float activities that may be associated with each phase but are not attached to them, to suggest some fluidity. These activities include concepts such as 'past and future use', 'ethics' and 'outcomes'. To support this table of conservation activities there is a set of core attributes to be considered within any project, which could be visited repeatedly, or at a specific time. These attributes are listed under four headings: documentation, evidence, evaluation and decision making (Figure 2).

THE SCHEME IN PRACTICE

Students are encouraged from the very first day of teaching to maintain a reflective learning log. They are given conservation challenges in the form of objects or collections in need of conservation. A 'problem-based learning' approach is used for teaching (Henderson 2016), meaning staff cannot be prescriptive about the correct balance between these phases in their work. In conservation, some objects are easily identified, for example waterlogged wood, whilst others, such as a composite modern object, may require a great deal of identification work. Ethics and stakeholder analysis may be major features for some objects, but have less importance to others. Some conservation projects have complex practical challenges such as relaying flakes, building mounts or micro-cleaning.

Students are offered guidance by staff in the form of interim discussions and after one term are asked to submit a formal proposal (formatively marked) to confirm that they have understood the challenge and are developing an acceptable solution. Offering advice on attributes that would appear in most conservation projects helps set the scope of the work without necessarily determining the structure of its final outcome. Specifically, students are advised that: documentation will recur throughout the project from the initial condition report, consultation with owners or print-outs from analysis; relevant evidence must be used to inform their decisions and the goals that they set; and evaluation of their work may inform revisions as treatment progresses. Any of these steps may happen in all three phases (Figure 2).

Each phase is largely self-evident. They are chosen to help students focus on the concepts that staff and, we believe, future employers will value. In our years of experience as teachers, the most fundamental error made by students is to fail to understand the object on which they plan to work. This can be as simple as failing to understand the porosity of a ceramic or recognise a detail that is essential to its future use. Understanding is essential in defining the type of analysis required, levels of intervention and modes of intervention. In a complementary manner, it is important to understand why an item is valued. A miniature aeroplane brought to the lab for conservation was the subject of a major significance assessment by a student connecting it to events of the Second World War (Newcombe 2016), confirming that it was intended as a model, not a toy, and thus informing the appropriate degree of intervention during treatment. The condition of an object is also a vital component of understanding it. Students are encouraged to ask: Is the bulge in the piece of leather shoe evidence of a medieval toe? Is the removal of the edge of a coin evidence of currency devaluation? Are the patterns of corrosion evidence of use?

Once the student conservator understands the object, they can prepare a treatment strategy. The understanding phase may be returned to, but at this point the student must draw together resources from the literature, experimentation and observation to devise a strategy. In this phase, students are encouraged to integrate theoretical approaches in practical contexts: perhaps a solvent is identified which might remove a stain, but there is potential negative impact on one aspect of the substrate. Manipulation of application techniques and careful manual dexterity may mitigate such a worry. Students may have to learn to operate a range of tools and equipment and must identify their own technical abilities and develop them as necessary. Once a decision on treatment is made, the student can begin to enact it. The PNB described earlier should capture their own experience of the project, and the formal laboratory documentation captures the essential catalogue of conservation such as analysis results, intervention and materials used. Some treatments are made complex by the combination of materials in an object, such as a silver wire braid on a silk thread on a felt hat. Some are complex due to the multiple layers of past interventions of varying qualities, and some objects are more delicate than the contaminant that obscures details rendering the precision of tool use and the construction of support fundamental. For most interventions, the students will have to learn new skills dictated by the challenge. For example, a pair of crepe paper fairy wings for display evidently needed a support and the student determined Perspex support wings were the solution, requiring her to learn to use a router to cut them around a plywood former.

Students are encouraged to evaluate their successes and to learn and grow from challenges, combining critical thinking with confidence building, as well as to self-evaluate outcomes, to see mistakes, diversions, delays and uncertainty as markers on the road to competence. The active engagement in constructing meaning from learning experiences, making sense of new knowledge and integrating it with previously held understandings, is an active, social and embodied process (Vygotsky 1978). It is a measure of increasing confidence as students move from externalising this experience

Figure 3. Completed replica molar with original (Ruth Murgatroyd)

by looking to the staff for an evaluation at the end of a project, to taking personal responsibility throughout the whole process.

This description of the phases of conservation and assurance that marking will be object appropriate still did not offer students sufficient reassurance. Student expectations of clarity in grading are justifiably high. Education represents a major expense and can be the launch point into a fantastic career. However much academics wish to celebrate learning for learning's sake, a student must pass a degree to hope to unlock this career path. Other ways of offering guidance are key exemplars and success criteria (Ormond et al. 2002).

ADDITIONAL ASSURANCE FOR STUDENTS: SUCCESS CRITERIA

Although a model conservation project can look like it has never been conserved, the concept of model answers still has validity. In addition to the replacement of the detailed marking template with guidance on phases and attributes of conservation, a set of success criteria have been developed. These correlate with the learning outcomes, professional guidelines, academic theory and phases already described. They complement institutional criteria without covering similar ground. Based on a Masters level grading, the following four levels for distinction, merit, pass and fail describe what a conservation project marked at each level would look like (Table 2). Students are introduced to these in a seminar working through their application to conservation projects. They are advised that a project may not contain all of the criteria, but delivering work that matches any of the characteristics of failing work is likely to have very large impact on marking decisions. The success criteria do not cover the full range of potential grades available at both undergraduate and postgraduate level. They are intended to be level indicators, linked to a professional framework but without the excessive detail required for each grade boundary, the 'spiralling specifications' of criteria (Wolf 1995).

EXAMPLES

The concept that conservation is an appropriate response to the object or challenge is described below by two case studies of excellent student work. These examples are drawn from real life and we are grateful to the students for allowing us to showcase their work.

Replica and handling artefact

The student was presented with an Indian elephant molar that was to feature in a travelling natural science exhibition. The curator wished to have a mystery handling item in a box and although the tooth was the first choice, it was assessed as not being suitable for security and conservation reasons. The challenge was to use the original elephant molar and make a replica for the handling box. The object identification was relatively simple, although analysis of some old adhesive was required to make a decision to reverse or consolidate old repairs. Condition assessment revealed cracks which could be threatened by a casting process. To understand how the exhibition would work in each location, the student engaged in stakeholder consultation. The conservation decision making involved

Table 2. The ten elements of conservation for distinction, merit, pass and fail level grades

	Distinction	Merit	Pass	Fail
1	Demonstrates the application of academic abilities described at distinction level in the school marking scheme in the delivery of practical outcomes.	Demonstrates the application of academic abilities described at merit level in the school marking scheme in the delivery of practical outcomes.	Demonstrates the application of academic abilities described at pass level in the school marking scheme in the delivery of practical outcomes.	Is unable to demonstrate the application of academic abilities in the delivery of practical outcomes or an academic approach characterised at fail level in the school marking scheme.
2	Is able to precisely characterise the materials, composition and significance of the conservation project.	Is able to precisely characterise the materials, composition and significance of the conservation project.	Is able to characterise the materials and composition of the conservation project	Fails to characterise the nature of the objects' materials and composition or their significance.
3	Uses challenges as an impetus to develop solutions.	Works independently seeking advice or confirmation on self-generated and well-considered options.	Can generate broad options for action and is able to offer a basic critical evaluation of them.	Is unable to research, formulate and evaluate conservation options, seeking external guidance on both the creation and evaluation of options for treatment.
4	Enacts independent quality control, identifies errors in practice quickly and puts into place mitigations quickly and independently.	Enacts independent quality control, identifies errors and seeks advice on mitigation quickly.	Seeks support for quality control, identifies errors and ceases an activity within a reasonable timeframe.	Fails to notice errors and continues with activities that compromise the integrity of the object, fails to attend to advice on quality of work.
5	Demonstrates exceptional mechanical / craft skills.	Demonstrates very good mechanical / craft skills.	Demonstrates acceptable mechanical / craft skills.	Delivers work that has the potential to destabilise an object, fails to address the core concerns when an option is available or creates irreversible negative outcomes on the integrity of the object.
6	Delivers outcomes which are ready for immediate use in a professional context on a project, demonstrating one or more of Icon's definitions of complexity.	Delivers outcomes which are ready for use in a professional context, although may need minor adjustments or modifications (i.e. packaging, documentation, interpretation of analysis) on project, demonstrating at least one of Icon's definitions of complexity.	With direction from staff, delivers outcomes which are acceptable for use in a professional context, although may need minor adjustments or modifications (i.e. packaging, documentation, interpretation of analysis) on projects, demonstrating at least one of Icon's definitions of complexity.	Is unable to deal with complex challenges, fails to deliver any significant outcomes where options are available.
7	Delivers work that significantly enhances the ability of user to benefit from the object (use, understanding, enjoyment).	Delivers work that contributes to the ability of user to benefit from the object (use, understanding, enjoyment).	Delivers work that maintains the ability of user to benefit from the object (use, understanding, enjoyment).	Delivers work that adds no value to the object.
8	Manages multiple tasks and projects to challenging deadlines delivering agreed outcomes.	Manages time and projects effectively to deliver agreed outcomes.	Completes tasks to agreed deadline, delivering agreed outcomes.	Is not able to complete agreed tasks within deadlines.
9	Can follow, review, enhance or improve instructions and operating procedures as necessary.	Shows an ability to follow instructions and operating procedures, enhancing them where necessary.	Shows an ability to follow instructions and operating procedures.	Fails to follow or ignores protocols and instructions issued by staff and seeks to offset responsibility.
10	Demonstrates the ability to reflect on and learn from their own practice.	Demonstrates the ability to reflect on and learn from their own practice.	Demonstrates the ability to reflect on and learn from their own practice.	Fails to use reflection to draw lessons for their own personal development.

consideration of the cracks, consultation on the sensory and visual qualities required, security and ease of use on display and the absolute deadline of an exhibition opening. The student opted for a temporary fill for the cracks and a classic casting technique. Considerable reflection went into offering a safe and durable casting material that would capture weight and texture. The painting of the replica was exquisite. The student also devised a securing system and created a bespoke box displaying excellent craft skill. The resultant offer was delivered on time to the exhibition and has travelled with it through several museums.

Ichthyosaur vertebra

The second case study is the conservation of an ichthyosaur vertebra brought to conservation due to a concern about visible cracking. The student undertook considerable analytical research on the composition of the fossil utilising a range of analytical techniques. Understanding the composition and decay set off a chain of research. Although the student discovered treatment recommendations in the literature, her critical reading revealed that few of the solutions offered were based on original research and most on an evolution from a single source. Long-term validation studies were not available. The most common intervention involved a known risk. Having stripped the literature back to the evidence base, the student then engaged in a careful evaluation and weighting process of the options featuring risk, uncertainty and the use requirements of the owners. The conclusion was to deliver a meticulous mechanical clean and preventive packaging in an atmosphere that would inhibit further decay.

DISCUSSION

Contrasting these projects highlights the diversity of excellence in conservation practice. In the first case, identification of material and diagnosis of causes of damage were simple tasks. Identifying an ethical stabilisation technique for the casting process was more challenging: identifying and integrating users' needs into the technical delivery of the replica drew together complex and divergent strands. The final product was exquisitely crafted and delivered to a strict deadline. For the second project, diagnosis and research into composition, analytical testing and critical evaluation of the literature resulted in a carefully weighted and ethically informed assessment of options. The final treatment was technically simple but appropriate. In both cases the nature of excellence was determined by the challenge inherent in the object and context. To have standardised the tasks to allow a simplistic consistent marking scheme would be to disarticulate conservation from any real world value.

CONCLUSION

There is an increasing tension between the demand for clarity, accountability and equal treatment in education and the need to deliver skilled practitioners able to respond to diverse and differing challenges with competencies that are recognised and desired by employers (Henderson and Parkes 2014). Given the diverse nature of conservation projects, the crossover between staff and students during laboratory practical time is an essential

part of the learning experience and the amount of time devoted to it must be maintained to ensure high professional and academic standards. The requirement for students to take workplace experience may also open up their understanding of shared values within the conservation profession. Developing a marking scheme and criteria is not in and of itself a complete solution to the difficulties of marking practical projects. The enhancement of student understanding of the assessment criteria that help to improve their learning is a process with a number of components.

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REFERENCES

BAUMARD, P. 1999. *Tacit knowledge in organizations.* London: Sage Publications.

CARDIFF UNIVERSITY. 2016. Cardiff University Assessment and Feedback Project https://intranet.cardiff.ac.uk/staff/the-way-forward/sub-strategies/education/student-engagement/assessment-and-feedback-project (accessed 15 November 2016).

ECCLESTONE, K. 2001. 'I know a 2:1 when I see it': Understanding criteria for degree classifications in franchised university programmes. *Journal of Further and Higher Education* 25(3): 301–13.

HEFCE. 2016. National Student Survey, results for 2016. www.hefce.ac.uk/lt/nss/results/2016/ (accessed 11 November 2016).

HENDERSON, J. and P. PARKES. 2014. Do methods of assessment accurately reflect the priorities of conservation teaching? In *ICOM-CC 17th Triennial Conference Preprints, Melbourne, Australia, 15–19 September 2014*, ed. J. Bridgland, art. 0304. Paris: International Council of Museums.

HENDERSON, J. and R. WALLER. 2016. Effective preservation decision strategies. *Studies in Conservation* 61(6): 308–23.

HENDERSON, J. 2016. University teaching in the development of conservation professionals. *Journal of the Institute of Conservation* 39(2): 98–109.

MANTI, P., J. HENDERSON, and D. WATKINSON. 2011. Reflective practice in conservation education. In *ICOM-CC 16th Triennial Conference Preprints, Lisbon, Portugal, 19–23 September 2011,* ed. J. Bridgland. Almada: Critério Artes Gráficas, Lda.

NEWCOMBE, J. 2016. Model BE2c aeroplane. www.peoplescollection.wales/items/534681 (accessed 15 November 2016).

O'DONOVAN, B., M. PRICE, and C. RUST. 2004. Know what I mean? Enhancing student understanding of assessment standards and criteria. *Teaching in Higher Education* 9(3): 325–35.

ORMOND, P., S. MERRY, and K. REILING. 2002. The use of exemplars and formative feedback when using student-derived marking criteria in peer and self-assessment. *Assessment and Evaluation in Higher Education* 25: 309–24.

RAMSDEN, P. 1992. *Learning to teach in higher education.* London: Routledge.

RUST, C., M. PRICE, and B. O'DONOVAN. 2003. Improving students' learning by developing their understanding of assessment criteria and processes. *Assessment & Evaluation in Higher Education* 28(2): 147–64.

WATKINSON, D. and S. STEVENSON. 1996. Assessing student practical work. In *ICOM-CC 11th Triennial Meeting Preprints, Edinburgh, Scotland, 1–6 September 1996,* ed. J. Bridgland, 145–50. London: James & James.

VYGOTSKY, L.S. 1978. *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

WEBSTER, F., D. PEPPER, and A. JENKINS. 2000. Assessing the undergraduate dissertation. *Assessment and Evaluation in Higher Education* 25(1): 72–80.

WOLF, A. 1995. *Competence-based assessment.* Buckingham: Open University Press.

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