ELABORATING THE PURPOSES OF A MANCHESTER UNDERGRADUATE EDUCATION (The Manchester Matrix)

The Purposes of a Manchester Education College emphasised ILOs in bold	Graduate Attributes	Assessment Criteria
1. To develop critical thinking and higher order conceptual reasoning and analytical skills	Manchester graduates will have been encouraged to develop their intellectual curiosity, will have learned how to learn, will have a clear grasp of the fundamental differences between fact and opinion, truth and falsity, validity and invalidity, and will have acquired the basic intellectual tools of logical analysis and critical inquiry.	1a. Logical reasoning 1b. Analysis 1c. Synthesis 1d. Evaluation
2. To promote mastery of a discipline	Manchester graduates will have mastered the epistemological, methodological and essential knowledge base of at least one discipline or taught in the University, acquiring a basic understanding of the processes of inquiry and research through which existing paradigms are evaluated and new knowledge created in that discipline or disciplines	2a. Knowledge 2b. Epistemology 2c. Methodology 2d. Comprehension 2e. Application
3. To broaden intellectual and cultural interests	Manchester graduates will be encouraged to value knowledge for its own sake, and to appreciate virtuosity and creativity, whether in art, music, literature or any other medium through which human discourse and human culture are advanced and	**3a. Intellectual curiosity** **3b. Cultural awareness**

College Assessment Sub-group Feb' 2012

		3c. Understanding of the historical development and cultural context of particular traditions, disciplines or bodies of knowledge
4. To prepare graduates for professional and vocational work	Manchester graduates in professional disciplines will have the knowledge and advanced technical skills demanded in a an increasingly sophisticated and rapidly changing professional workplace, and will have been provided with opportunities to develop accompanying skills of initiative, teamwork and professional communication.	4a. Professional knowledge 4b. Professional Skills **4c. Professional Qualities** **4d. Communication and Team work**
5. To challenge and equip students to confront personal values and make ethical judgements	Manchester graduates will have been provided with opportunities to develop personal qualities of independence of mind and to take responsibility for the values, norms, assumptions and beliefs that guide their behaviour as individuals and citizens.	**5a. Ethical awareness** **5b. Grasp of ethical principles** 5c. Awareness of relevant professional ethics
6. To prepare graduates for citizenship and leadership in diverse, global environments	Manchester graduates will have been encouraged and enabled to confront their own civic values and responsibilities as local, regional and global citizens.	**6a. Awareness of social, political and environmental issues** **6b. Sense of social responsibility** **6c. Leadership skills**
7. To develop advanced skills of written and verbal communication	Manchester graduates will be equipped with advanced skills of written and verbal communication.	7a. Ability to communicate verbally and in writing lucidly, accurately, relevantly, succinctly and engagingly

8. To promote equality and diversity	Manchester graduates will have been educated in an environment that embraces and values cultural diversity, and that is fundamentally committed to equality of opportunity regardless of gender, race, disability, religious or other beliefs, sexual orientation or age.	**8a. A key consideration informing the design, development, delivery and assessment of all Manchester curricula**

A GUIDE TO WRITING AIMS AND INTENDED LEARNING OUTCOMES

Introduction

A clear and appropriate statement of aims and intended learning outcomes forms an important element in programme design, in quality assurance and in focusing student learning. It is thus important that aims and intended learning outcomes are written in ways that facilitate these processes. In the light of this consideration, the purpose of this paper is to provide guidance on the scope and construction of aims and intended learning outcomes, and on links with the wider programme.

The paper concentrates on aspects of writing aims and learning outcomes that experience from reviewing documentation and from working with colleagues indicates are often problematic. More specifically, we consider the following issues:

- broadening the scope of aims;
- indicating level in a intended learning outcome.

In addition, we consider in Appendix 1 the relationship between intended learning outcomes and standards of performance. A consideration of this relationship enables us to clarify whether intended learning outcomes should be set for the typical or threshold student, and also to help ascertain the level of detail that is required.

A broader approach to aims

A programme *aim* is a general statement about the purpose of the programme. Aims are thus primarily concerned with what the programme hopes to achieve, and they are typically written in terms of teaching intention rather than the learning of the student. Note, however, that pre-requisites for running the programme should not be recast as aims, as is the case for the following 'aims':

- to employ an appropriate variety of teaching and assessment methods to meet the programme's aims and learning outcomes;
- to use learning resources effectively and efficiently to meet the programme's aims and learning outcomes.

While the aims of a programme will primarily concern the students themselves, wider aims may also be relevant. Indeed, it is often only by considering a wide range of aims that the real distinctiveness of a programme is seen to emerge. An appreciation of the distinctiveness of the programme is useful in programme design and in conveying to students and others its unique features. It will thus be helpful to consider several types of aim as indicated in Table 1. There is, evidently, overlap between the categories in Table 1 and it is further possible to set aims that incorporate more than one of these categories, as in the following example:

- to enhance students' capacity to engage in extended project work, both on an independent basis and in collaboration with their peers, and thereby to prepare students for further academic study and employment.

Type of aim	Examples of aims
Student-based	To explore the central features of the discipline; to attract

	students who will benefit from studying in a research-enrolled environment; to open access to the study of a range of specialist areas within the discipline; to focus on the contested nature of knowledge within the discipline.
Department or Subject based	To provide a seed-bed for ideas that can be exploited in research programmes within the department; to provide the disciplinary community with new members; to constitute an example of best practice to other departments in how to teach the discipline.
Employer-based	To meet the requirements of potential employers in a specific sector.
Society-based	To positively impact on the social fabric of the local community; to widen participation within the body of students studying the discipline; to contribute to society through the development of a sense of civic responsibility in the students on the programme.

Table 1, Types of aim

Writing learning outcomes

An *intended learning outcome* is a concise description of what a student will have learnt at the end of some learning process. One of the main advantages to stating the intended learning outcomes (simply now referred as learning outcomes) from a course of study is the way in which this allows one explicitly to consider the ways in which the goals for student learning are constructively aligned with both the methods used for teaching and supporting learning and the assessment on the programme.

Given their key role in helping to shape the educational process, it will be useful to review key aspects of writing learning outcomes. This review will also provide an effective foundation for the next section, which looks at what is perhaps the most challenging aspect of writing a learning outcome; namely indicating the level of the outcome.

A review of how to write learning outcomes

A learning outcome typically consists of sentence that begins with a phrase such as 'At the end of this programme it is expected that you will be able to', which is then followed by three elements (examples for these aspects of a learning outcomes are provided in Table 2):

- an active verb (often with an associated adverb);
- an object of the verb (indicating on what the learner is acting);
- a phrase that indicates the context or provides a condition.

Verb	Object	Context
Critically evaluate	new technical, regulatory and policy developments in law	especially in relation to notions of justice[1]
Recognise	any risks or safety aspects	that may be involved in the operation of computing equipment within a

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[1] This example, and other examples, are taken from documentation submitted within the University for quality assurance purposes.

		given context

Table 2, Examples of the three elements of a learning outcome

The actual content of each learning outcome is, of course, shaped by a number of actors. We thus highlight here some of the more important issues that need to be addressed:

- Categories of outcome — In general, learning outcomes describe intended learning in terms of knowledge, understanding, skills and other attributes. In particular, the University's template for a Programme Specification requests information on knowledge and understanding, and on intellectual, practical and transferable skills (see Appendix 2 for a list of various skills.)

- Balanced outcomes — There should be an appropriate balance between the subject, personal and professional learning outcomes.

- Different views — It is possible to view a programme in three different ways: a collection of course units; a number of years; and an entire programme. Viewing a programme in these ways can help to ensure coherence between the different course units, across the various years of the programme and within the programme as a whole. It is therefore useful to state the learning that is intended to result from each course unit (course unit outcomes), from each year of the programme and from the programme as a whole (programme outcomes).

- Realistic – Learning outcomes must be achievable within the constraints of time and other resources, and the learning and teaching context provided.

- Developmental – Learning outcomes should be developed in part using feedback from previous learners (i.e. about what they identify and value).

- Understandable – The context and meaning of learning outcomes should be understood easily by interested parties, e.g. colleagues, learners and employers.

- Process versus product – Learning outcomes should not simply constitute a statement of the process by which the learning takes place For instance, you will want to develop in students 'the ability to plan and implement a research project' rather than simply get them to 'have some experience of research'.

Indicating level in learning outcomes

When writing learning outcomes that concern knowledge and understanding, staff often simply provide a statement of the content that is covered. This, at least, is the perspective that a review of quality assurance documentation provides. Take for instance the following outcome:

> Knowledge and understanding of specific disciplines including periodontology, preventive dentistry, dental, dental radiography and orthodontics.

It is difficult to see the what kind of understanding is required. Does the understanding have to be critical in any sense or connected to relevant areas of professional practice? The outcome as stated relies, in effect, on a set of accepted norms for the kind of understanding that is expected within the discipline in question. Indeed, with a few stylistic changes, a

syllabus can therefore suffice for a statement of learning outcomes. Learning outcomes are redundant.

Learning outcomes, however, offer a significant advantage over a syllabus by providing an explicit indication of the abilities that students actually should be learning. Where the nature of the intended learning is clearly spelled out learning outcomes can, for instance, be of use in more directly considering the appropriateness of specific teaching methods, and also in framing appropriate assessment tasks, criteria and feedback on student learning (see for instance Biggs, 1999). In addition, learning outcomes can assist in personal development planning for students, providing a basis for planning, activity and reviewing. A syllabus cannot easily serve all of these functions. Indeed, basing teaching simply around a syllabus tends to lead to viewing teaching as a fixed activity that is never adapted to the specific abilities that students are trying to master. It is worth noting that a clear match should be evident in a Programme Specification between the programme outcomes, the methods employed for teaching and supporting learning, and the assessment. What is clear, furthermore, is that an explicit indication of level[2] is needed if a learning outcome is to fully specify the intended learning. Such an indication of level actually helps to set the expected standard that must be achieved.

In disciplines where knowledge is organised on a strongly hierarchical basis, however, one might still argue that it should not matter whether one favours a syllabus or a statement of learning outcomes. After all, in such disciplines the level of understanding one can argue that the level is at least implicitly indicated within a syllabus. Take for instance the following outcome:

> At the end of the programme, students will have an understanding of how accounting and information systems informs and is informed by economic, organisational, social and political contexts.

Here one could argue that the level is implicitly provided by the sophistication of the subject matter. But this still fails to articulate the nature of the understanding that is required. Does the understanding need to be systematic, original or critical? Is there any need to recognise the interplay between the specified contexts? We still need to go beyond an implicit indication of level if a learning outcome is to help shape student learning.

Further ways to specify level

How then can one take advantage of the additional possibilities for specifying level that are afforded by a set of learning outcomes? The approach suggested here is, first of all, to specify **the nature of the understanding** that is sought. Perhaps the most useful categorisation for different types of understanding is that provided by Bloom (1964). He views understanding according to the following hierarchy:

- knowledge; comprehension; application; analysis; synthesis; evaluation.

(See Appendix 3 for verbs to use in learning outcomes that reflect this hierarchy.) Are we looking for a *systematic* understanding, or will a *haphazard* grasp suffice? Similarly, the intended understanding may be *critical*, *conceptual* or so on.

It is also relatively easy to fail to indicate level when making statements about skills. When dealing with intellectual skills and practical skills, then the disciplinary context may, as above, provide a partial indication of the level, but even this will not hold where transferable skills are concerned. For instance, one might consider the following learning outcome:

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[2] We use the term 'level' here to indicate a hierarchical categorisation of learning outcomes: this categorisation is closely related to the year of study. We follow the National Qualifications Framework which spells out the following levels: Certificate (year 1); Intermediate (year 2); Honours (year 3); Masters; Doctoral.

You will be able to work in a team.

But students are able to work in a team by the end of primary school! As stated, this outcome provides little help in designing an appropriate programme. It therefore again helps to specify more clearly the actual nature of the ability in question.

Such a more detailed consideration of the ability in question also needs to take account of a number of further considerations. Level may be provided in part by framing learning outcomes that require students to have mastered **the interplay between two or more abilities**. We might therefore consider developing the above outcome about working in a team to the as follows:

You will be able to give an oral presentation as part of a team, based around the earlier joint solution of a problem.

However, even indicating such interplay will often fail fully to articulate the nature of the learning that occurs. In particular, it is important to take into account the context in which these abilities are developed. We can consider the following elements that help to make up this context:

- **the extent of autonomy involved;**
- **the inherent complexity of the context;**
- **the degree of originality**.

A learning outcome will clearly be more challenging if the student is expected to attain it without detailed guidance from a lecturer. Similarly, the context that frames the learning will also influence the level of difficulty. An outcome that requires students to adapt their response as the situation changes in an unpredictable fashion is clearly more challenging than one in which the demands placed on the student remains constant. Meanwhile, the degree of originality that is involved in carrying out some task will again affect its level. This is more obvious towards Masters and PhD level, providing a key distinguishing factor at these levels from earlier levels. We might thus develop our outcome related to team-work to the following:

You will be able to give an oral presentation in a team to specialist and non-specialist audiences, critically evaluating both the team's performance and your own contribution to the team.

Taken together, all of these above considerations combine to indicate the level of an outcome, giving arise to a explicit hierarchy within any set of learning outcomes. The features that indicate level are summarised within Table 3.

Such an explicit focus on level does, of course, not dispense with the need for the context that is provided by the subject. Judgements against national standards, for instance, are difficult to make without reference to specific subject matter. Hence the National Qualifications Framework (see Quality Assurance Agency for Higher Education (QAA), 2001), especially at undergraduate level serves to provide a context for different subject benchmark statements (see QAA, 2002) rather than to provide a primary point of reference. What is apparent, however, is that without an explicit indication of level learning outcomes are far less useful.

Factor	Words and phrases to help introduce factor
Nature of ability	Coherent knowledge; systematic comprehension; application to unseen problem; conceptual analysis; wide-ranging synthesis;

	critical evaluation; generate alternative scenarios.
Combination of abilities	Interplay between; in light of; taking into account the impact of; while also; an integrated approach; at the same time as.
Autonomy	Within a structured and managed environment; some self direction, awareness of own learning; initiate and carry out projects; manage or advance own learning; monitoring progress; personal responsibility; autonomous planning; evaluating your own performance; enhancing your skills.
Context	Specialist and non–specialist audiences; variable demands; use scholarly reviews and primary sources; effectively adapting to new demands; unpredictable situations; incomplete data; appreciate uncertainty; identify a range of solutions; managing dynamically complex work.
Originality	Established techniques; standard methods of solution; current problems; devise novel approaches; recent research; creative responses; informed by the forefront of the discipline; at the forefront of discipline; innovations in practice; extending the theoretical basis; limits of knowledge; originality in the application of knowledge; creation and interpretation of new knowledge; meriting publication.

Table 3, Factors that contribute to an indication of level in a learning outcome, beyond a statement of the subject matter in question

Conclusion

The Higher Education sector as a whole has now accepted aims and intended learning outcomes as integral elements of good practice in teaching and the support of learning. However, if intended learning outcomes in particular are created simply for quality assurance purposes, and are not drawn upon in designing effective programmes and enabling student learning, then it is understandable that they are seen as a burden. This paper, in particular, has sought to explore ways in which learning outcomes need to be specified if they are to be useful more widely, contributing to the design of both teaching and assessment.

This guidance was written by Dr Peter Kahn (Teaching, Learning and Assessment Office) in July 2004.

Appendix 1: Learning outcomes and standards of performance

The relationship between learning outcomes and student performance is a complex one. It is, of course, true that some students will be able to achieve the specified learning outcomes whereas others will not, even at a minimal standard of performance. Meanwhile, many students will learn more than is specified within the learning outcome. Thus, in an overall sense, a statement of learning outcomes does provide a coarse way of indicating a standard of performance. Yet at the same time, a learning outcome is not designed to fully specify student achievement. Two students may achieve the same learning outcome, but to differing extents. A tension is thus present, one which is often resolved by simply ignoring the relevance of learning outcomes to assessment. We will explore in this appendix a number of ways in which learning outcomes can contribute to making judgements about student performance. In the process we will clarify two important issues that concern writing learning outcomes: whether the learning outcomes reflect either the threshold requirements that all students are expected to achieve or the expected achievement of a typical or modal learner; and the level of detail that is required.

Threshold or modal?

If a learning outcome states that students '*will* be able to do something on completion of the course', then this suggests that a threshold outcome is in play. Even here, however, the language may hide a modal outcome. Introducing the idea of that it is 'expected that students will be able to do something on completion of a course' makes the modal character of a learning outcome more explicit.

Unless there are good reasons to specify learning outcomes in threshold terms (e.g. in certain professional disciplines) it would usually be expected that they would be framed in modal terms. This will make it clear that our programmes exceed those of the benchmark statements. However, one might wish to use threshold learning outcomes to help shape grade descriptors that are positive, say, even when describing performance for a Third Class honours degree.

Assessment criteria and grade descriptors

The relationship between learning outcomes and student performance is clearest when considering both assessment criteria and grade descriptors. A set of assessment criteria provides a framework in which judgement can be made about a student's performance. As an example we can take one of the assessment criteria from the newly approved Postgraduate Certificate in Learning and Teaching in Higher Education at the University:

> Extent to which the work is analytical in style and approach, with critical understanding and interpretation.

Furthermore, a clear match will be evident between any assessment criteria and the learning outcomes. Indeed, the statement of learning outcomes may well be used to help decide upon the criteria. We can see, for instance, the correspondence between the above example and one of the related programme outcomes:

> Ability to engage in self-directed analysis and synthesis of teaching practices, and evaluation of the impact of that practice upon the students concerned.

An assessment process, however, usually results in specifying a student's performance at one of a number of grades. One typically thinks of the usual degree classifications or of a percentage scale. The assessment criteria will thus usually lead to a set of grade descriptors,

or in certain cases a marking scheme or model answer. Such further specification of the standard against which a student's work is judged are, of course, necessary required to ensure the reliability of the assessment. It is worth emphasising here that grade descriptors are likely to incorporate the following two elements:

- adjectives that describe the degree to which a particular criteria has been demonstrated, e.g. good, fully, partially, excellent. (Note: these adjectives will not normally figure in the statement of a learning outcome, as they refer more directly to the standard of performance against the learning outcome)
- aspects of student performance that only figure at the higher or lower grades of performance. For instance a learning outcome at modal level may incorporate elements that are not present within the work of a failing candidate or a First Class performance may introduce a new element that goes beyond achievement at modal level.

In particular, there will be a clear match between threshold outcomes and grade descriptors for a Third Class degree and between modal outcomes and the border between Upper and Lower Seconds. It is worth comparing the programme outcome given above with the grade descriptors that refer to the ability to engage in analysis:

> (0-39%) Limited grasp of the relevant ideas and issues; (40-49%) Grasp of the relevant ideas and issues is evident, although limited; (50-59%) Analytical in style and approach at times, although descriptive and prescriptive for the greater part; (60-69%) Analytical in style and approach, with some critical interpretation; (70-100%) Highly analytical in style and approach, with critical understanding and interpretation.[3]

The comparison suggests strongly that the programme outcome has been set at modal rather than threshold level. Finally, it is worth noting that a match should also be evident between marking schemes and the actual learning outcomes and any associated assessment criteria, although the links will typically be less explicit.

In conclusion, one might also think of a continuum of the ways in which learning outcomes and assessment criteria seek to articulate student performance. Learning outcomes in which level is clearly articulated provide a coarser approach while assessment criteria and grade descriptors provide the basis for a more fine-grained approach.

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[3] Note that one often includes finer divisions of firsts, e.g. 70-79% and fails, e.g. 30-39%.

Appendix 2: Skills and other attributes

Intellectual skills

Critical thinking – capacity to abstract, analyse and make critical judgement
Problem solving – ability to solve problems in an efficient and effective manner, drawing on problem solving strategies as relevant
Problem posing – ability to frame problems in a fashion that is amenable to their solution.
Synthesis and analysis of data and information
Planning, conducting and report on research project/dissertation
Critical reflection and evaluation
Translation
Expression – able to make a reasoned argument for a particular point of view
Decision-Making – able to draw reasoned conclusions

Practical skills

Planning and executing safely a series of experiments or independent research
Using library, electronic and online resources
Using reporting skills
Mapping and modelling
Audit production
Speaking, reading and writing a foreign language at near-native proficiency
Treating patients in certain defined clinical procedures
Peer review – able to comment on the performance or work of a peer, identifying strengths and making constructive suggestions for improvement where appropriate

Transferable skills

Information Retrieval – ability independently to gather, sift, synthesise and organise material from various sources (including library, electronic and online resources), and to critically evaluate its significance.
Presentation – capacity to make oral presentations, using appropriate media for a target audience
Numeracy – ability to appreciate issues of selection, accuracy, uncertainty and approximation with number)
Literacy – the capacity both to make written presentations using appropriate language for a target population and to collect and integrate evidence to formulate and test a hypothesis
Computer Literacy – ability to use word processing, database, spreadsheet and presentation software and the use of the Internet
Networking
Teamwork – recognising and identifying views of others and working constructively with them
Negotiation - understand group dynamics and intercultural backgrounds in the use of negotiating skills to reach objectives
Time Management – ability to schedule tasks in order of importance
Applying Subject Knowledge – use of discipline specific knowledge in everyday situations
Research – ability to plan and implement an effective research project.
Improving own Learning – ability to improve one's own learning through planning, monitoring, critical reflection, evaluate and adapt strategies for one's learning

Other attributes

Willingness to update knowledge – understand the need for Life Long Learning

Listening – ability to listen effectively and make a constructive contribution to a discussion

Commercial Awareness – working effectively within externally or poorly defined constraints as in a business environment

Initiative – able to take action unprompted and assume responsibility

Creativity – able to be innovative and apply lateral thinking in problem solving and decision making

Stress Tolerance – able to use personal resources effectively to meet challenges

Self-confident – able to maintain independence of thought and be self-reliant

Independence – capacity for self-discipline, motivation and diligence

Self-management – capacity for self-appraisal, reflection and time management

Adaptability – ability to respond positively to changing circumstances

Self-awareness – awareness of own strengths and weaknesses and to be able to work as part of a multidisciplinary team

Ethical appreciation – a willingness to ascertain the ethical implications of proposed courses of actions or situations and to take the necessary steps to ensure that result from this analysis

Professionalism

Appendix 3: Verbs for use in Learning Outcomes

Use of the following verbs can help in the construction of learning outcomes:

Knowledge: What do you expect learners to know?
- define; state; list; outline

Comprehension: How do learners convey what they have understood?
- explain; identify; discuss; describe; interpret

Application: How do learners use a theory or information in a new situation?
- demonstrate; apply; operate; employ; illustrate.

Analysis: How do learners break down material and ideas into constituent parts to show how they relate to each other and how they are organised?
- Distinguish; appraise; debate; solve; differentiate; contrast; examine; investigate; calculate; question; analyse; test; criticise.

Synthesis: How do learners work with elements and combine them in a way that was not there before?
- devise; manage; design; organise; create; plan; construct; formulate.

Evaluation: How do learners construct an argument, compare opposing arguments, make judgments?
- Judge; evaluate; appraise; criticise; assess.

Acknowledgements

This paper has been informed by Bingham (1999), discussions within a Working Group at the University of Manchester on aims and intended learning outcomes and the University's Student Satisfaction Survey.

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Further Reading

Biggs J (1999) *Teaching for Quality Learning at University*, Kogan Page, London

APPENDIX C

	Form of assessment	No. of students 100+ (VL) 60-99 (L) 30-59 (M) 0-29 (S)	Manchester Matrix ILOs and assessment criteria *= particular strength in this area (See Appendix A)	Type Individual, Peer assessed, group assessment, self assessment	Remarks on resources	Further information
1	Unseen Examination in controlled conditions (e.g. 3 questions in 3 hours)	S-VL	1a-d, 2a-e, 3a-c, 5a-b, 6a, 7a.	Individual	Potentially, heavy on marking resource	
2	Seen Exam Paper in controlled conditions	S-VL	1a-d, 2a-e, 3a-c, 5a-b, 6a, 7a.	Individual	Potentially, heavy on marking resource	
3	Take-Away Examination Paper	S-VL	1a-d, 2a-e, 3a-c, 5a-b, 6a, 7a.	Individual	Potentially, heavy on marking resource	
4	Multiple Choice Test in controlled conditions (paper-based)	S-VL	1a-d, 2a-e, 3a-c, 5a-b, 6a	Individual	Can be marked by machine but see E1.	
5	In-class test	Size of class	1a-d, 2a-e, 3a-c, 4c-d, 5a-b, 6a, 7a.	Individual		
6	Poster	S- L	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a, 6c*, 7a*.	Group (4-6)		

Assessment Toolbox - Forms of assessment and The Manchester Matrix

APPENDIX C

7	Essay	S-VL	1a-d, 2a-e, 3a-c, 5a-b, 6a-b, 7a	Individual	Potentially, heavy on marking resource	
8	Project	S-L	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a*	Group (up to 8)		
9	Portfolio	Any	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a	Individual, group	Could also be peer assessed	
10	Dissertation Proposal	S-M	1a-d, 2a-e, 3a-c, 4c, 5a-b, 6a-c, 7a	Individual	Requires intensive use of resources (supervision, marking and feedback)	
11	Dissertation	S-VL	1a-d, 2a-e, 3a-c, 4c, 5a-b, 6a-c, 7a	Individual	Requires intensive use of resources (supervision, marking and feedback)	
12	Individual Presentation (peer-assessed)	S-M	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-c, 7a*	Individual	Potentially time-intensive with larger numbers.	
13	Individual Presentation (tutor-assessed)	S-M	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-c, 7a*	Individual	Requires intensive use of tutor resources and potentially time-intensive.	
14	Group Presentation (peer-assessed)	M-L	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a*	Group, peer		
15	Group Presentation (tutor-assessed)	M-L	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a*	Group		
16	Performance (e.g. musical or dramatic, role play)	S-M	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a*	Individual, group	Requires intensive use of tutor resources and potentially time-intensive.	

APPENDIX C

17	Oral examination	S-M	1a-d, 2a-e, 3a-c, 4c-d, 5a-b, 6a-c, 7a*	Individual	Requires intensive use of tutor resources and potentially time-intensive.	Examination may require presence of second examiner and/or recording for purposes of moderating marks.
18	Participation in lectures and/or seminars (assessed by the student)	S-VL	1a-d, 2a-e, 3a-c, 4c-d, 5a-b, 6a-b, 6c*, 7a*	Individual, peer	Potentially can be overly subjective, unfair and resource intensive if 'participation' is not clearly defined and transparent marking criteria employed.	Care needs to be taken that this does not unfairly disadvantage groups of learners e.g. those reluctant or unable to speak. NB Equality Act.
19	Participation in lectures and/or seminars (assessed by the tutor)	S-VL	1a-d, 2a-e, 3a-c, 4c-d, 5a-b, 6a-b, 6c*, 7a*	Individual	Potentially can be overly subjective, unfair and resource intensive if 'participation' is not clearly defined and marking criteria developed.	
20	Book review, journal review, case study review, abstract or conference paper	S-M	1a-d, 2a-e, 3a*, 3b-c, 4c-d, 5a-b, 6a-b, 6c, 7a	Individual		This could involve designing an intervention, implementation and evaluation. Interpreting a consultation scenario to address a problem
21	Learning logs/learning journal	S-M	1a-d, 2a-e, 3a*, 3b-c, 4c-d, 5a-b, 6a-c, 7a*	Individual	Can be used to assess participation (see 18 & 19)	Potentially, resource intensive if a weekly journal submission is required. Journal submissions at 1 or 2 at key points through the course as a way of giving formative feedback, and as a way of getting feedback on the delivery of the course, is potentially valuable.
22	Objective Structured Clinical Examination (OSCE)	S	1a-e, 4a-b*	Individual	Requires intensive use of tutor resources and potentially time-intensive.	

23	Newspaper article	S-VL	5a-c, 6a-b, 7a	Individual, group	Peer or academic feedback	
24	Committee briefing, Letters of advice	S-VL	1a-d, 2a-e, 4c-d, 5a-b, 6a-c.	Individual, group		Has been used in policy around public health matters
25	Attendance	S-VL	4c	Individual	Requirement for accurate attendance monitoring	
26	Lab report/Report	S-L	1a-d, 2a-e, 4a-d, 7	Individual, group		
27	Short argument	S-L	1a-d, 2a-e, 4a-d, 7	Individual, group		Developing key points to an argument in a coherent and logical format but within a limited word count
	e-assessment					
E1	Formative & Summative Multiple Choice Tests (including "test yourself" e.g. Latin)	S-VL	1a-d, 2a-e, 3a, 3c, 6a	Individual, self	Potentially huge benefits for assessing VL cohorts as all marking is automated. Requires significant investment of time to create.	Can be especially useful as formative mid-semester assessment
E2	Wikis	M-VL	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a	Individual, group		
E3	Discussion boards	M-VL	1a-d, 2a-e, 3a*, 3b-c, 4c, 4d*, 5a-b, 6a-b, 6c*, 7a*	Individual, group, peer		
E4	Online portfolio	S-VL	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a	Individual, group		

APPENDIX C

E5	Creation of webpage	S-VL	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-b, 6c*, 7a	Individual, group		
E6	Creation of a podcast	S-L	1a-d, 2a-e, 3a-c, 4c-d*, 5a-b, 6a-c, 7a*	Group, individual	Length of time of podcast crucial for determining marking load.	Could replace group or individual presentations delivered in person saving class time.
E7	Weekly e-diary assessment	S-VL	1a-d, 2a-e, 5a-c, 7a.	Individual		

APPENDIX D Checklist for Assessment of Interdisciplinary units

	✓/✗
1. Accuracy	✓/✗
a. Is the assessment measuring the intending learning outcomes for the course?	
2. Level	✓/✗
a. Is the level of assessment for this cohort level 2?	
b. Are the assessments set to the same level across courses?	
c. have assessors had training to ensure that marking is consistent?	
3. Depth of assessment	✓/✗
a. Are assessments of sufficient depth to stretch students and demonstrate excellence?	
4. Resources	
a. How many students will be accessing the course?	
b. What resources are available?	
c. What assessment methods would be appropriate?	
5. Cultural norms within disciplines	
a. What are the current types of assessment used within programmes?	
b. Will altering the assessment put students at an unfair advantage/disadvantage?	
6. Connections	
a. How can the assessment be used to bring disciplines together?	
b. Will marks be allocated for cross discipline answers?	
7. Common language	✓/✗
a. Is there a common understanding and interpretation of language?	
8. Core competences	
a. What are the key skills and attributes students need to demonstrate as part of University College?	
b. What sets these students apart from other graduates?	
9. Marking criteria	✓/✗
a. Has each course developed transparent marking criteria?	
b. Do students have access to the criteria?	
c. Are all academics marking to the same level?	

Policy on Marking

Importance of marking

1. Marking is an important process. It provides a judgement of how well students have completed an assessment task.

The resulting marks are then used for feedback, for formative and summative assessment, and for decisions on progression and awards. Hence it is important that marking yields what can be defended in suitable ways as the 'right' marks. The present document is directed towards summative assessment.

2. There are two aspects to marks being 'right'. One is whether marks are awarded fairly and consistently across a cohort of students, and that is what this document deals with.

Given this, the other aspect is whether the absolute marks are appropriate. This aspect is ultimately handled by External Examiners in their review of marking standards and moderation where appropriate, and is not treated further here.

Professionalism in marking

3. For present purposes it is assumed that the assessment task has been properly designed relative to the intended learning outcomes, is clearly expressed to the student, and has been approved by the Board of Examiners.

Then the primary reassurance that the mark is 'right' is provided by the professional expertise and competence of the marker, who will normally be the teacher of the material.

Particularly, in relation to explaining marks (see below, Paragraph 7), it is helpful for each task to be supported by appropriate guidance on the expected answer and what would constitute different levels of performance.

The extent to which this is practical will depend on the discipline, but in any case it is necessary when the setter is new to teaching, when there are multiple markers of the same task or when an External Examiner requests it.

4. Marks awarded for summative assessment must be the responsibility of a duly appointed member of academic teaching staff. Marking done by others, such as visitors not appointed as visiting lecturers or Graduate Teaching Assistants, must be overseen by a member of teaching staff.

Anonymous marking

5. Anonymous marking helps to reassure students and others that marking is fair, and hence work should be marked anonymously wherever possible.

This clearly excludes tasks such as performances and presentations, but is required for all formal written examinations.

For intermediate cases, reasonable efforts should be made to achieve anonymity, for example by having essays submitted with a removable cover sheet, but in all cases the

choice of assessment task should be governed by its suitability for assessing the intended learning outcomes rather than its suitability for maintaining anonymity.

Checking marks

6. Schools should adopt procedures to check that all sections of each piece of assessed work have been marked, that partial marks have been totalled correctly and that total marks have been transferred correctly to marks lists. These procedures may be appropriately undertaken by administrative staff, but queries that arise must be referred to the academic in charge of the assessment.

Procedures should also be able to identify cases where an individual student's mark on one assessment deviates significantly from those for the others.

7. In cases where a student has not followed set instructions on an examination paper and has answered an incorrect number of questions or failed to answer a compulsory question, the following guidance is given:-

a) where a student has attempted too many questions, academic judgement should be used to decide which answers to mark and which should be disregarded.

b) where a student has failed to attempt a compulsory question (whether that be for the whole paper of within a section of a multi-sectioned paper), they will be awarded zero for that question. Academic judgement should then be used to decide what to mark and what to disregard from the remaining answers.

Explaining marks

8. All pieces of marked work should be provided with comments to indicate how marks have been assigned. The more specific any outline answer and mark scheme of the sort indicated in Paragraph 3, the less detailed the comments need be (unless a student has adopted an unforeseen approach), but where no two answers are likely to be the same, there must be a clear indication of why marks have been awarded or withheld. This helps External Examiners as well as others who may be involved in scrutiny.

9. Markers should ensure that comments on exam scripts, assessed coursework, discussion boards or emails will not cause misunderstanding or offence. Markers should also be aware that comments on exam scripts are personal data that students have a legal right to see. Markers should therefore consult the University's Data Protection Policy for guidance. The scripts themselves do not count as personal data subject to disclosure, and different policies may be adopted according to convenience: the script can be disclosed with the comments on it; the comments can be transcribed from the script; or the comments may be written separately in the first place (in which case they may be discarded separately from the script).

Scrutiny of marking

10. It is often desirable to provide additional scrutiny to provide reassurance that marking has been carried out appropriately. The nature and intensity of the scrutiny should depend on the perceived risk.

This will depend on a number of dimensions, which may be present separately or together.

a) *How well defined the assessment task is.* This can vary from a narrowly-defined task for which a model answer and detailed mark scheme can be provided, to a piece of discursive writing for which only indications of expected content and marking criteria can be provided. For a well-defined non-discursive task, scrutiny beyond normal checking of the marks is unlikely to be necessary. For more discursive tasks, it may suffice for a second examiner to review the marking of a sample against the stated marking criteria. Strict blind double marking will probably seldom be required.

b) *Whether different people mark the same task*, for example several staff marking an essay written by a large class to spread the load and provide faster feedback. For more discursive tasks, individual markers often test mark a sample to refine their marking schemes and then mark the whole batch including the sample. Similarly, multiple markers of such tasks can review each other's marking of a sample in order to agree a common marking scheme. For multiple markers of less discursive tasks, such a process may not be considered necessary, but in either case comparing the mark distributions for the different markers can reveal any significant differences for discussion and resolution.

c) *Whether mark distributions for the same cohort of students differ noticeably for different assessments.* At least for larger cohorts, it may be reasonable to ask whether or not the pattern of performance should be the same for different units. If this does not appear to be so, then possible reasons should be investigated.

d) *Whether different students perform different tasks,* for example individual projects or presentations (but not group tasks that are awarded the same mark for each student in the group). For tasks that vary between students, it may be desirable to have two markers, e.g. for individual student presentations for a whole cohort. However, markers need to have relevant expertise. Thus in a research project, depending on the intended learning outcomes the supervisor might mark the work for achievement, but a non-expert could mark the report as a piece of writing instead of or as well as the supervisor. This second marker could also mark or moderate several reports to assist with consistency.

e) *The importance of the mark*. The wish for extra scrutiny of marking may also increase as the importance of the mark increases. Thus marks may be regarded as more important the more they contribute to degree awards and classification.

11. Schools should state their policy for marking different types of assessment and Faculties will be responsible for ensuring that the policies of their Schools are each comprehensive and are equitable across the Faculty.

To indicate a properly systematic approach, Boards of Examiners should have information on the scrutiny given to the marking for each assessment.

Marking online assessment

12. In the case of online assessment the policy on marking applies in full. However, the choice of assessment task should be governed by its suitability for assessing the intended learning outcomes rather than its suitability for maintaining anonymity.

13. Procedure must also be adopted to ensure work is marked appropriately and checked in accordance with a marking scheme.

14. Feedback must also be given for the assessment in an appropriate forum, observing the section of this policy on explaining marks (para.7&8)

15. Appropriate scrutiny must also be applied to online assessment (see para.10) and the programme team must decide which statement applies to the situation (see 10a, b, c, d or e).

16. Schools are responsible for stating their own policies on the marking of online assessment and Faculties are responsible for ensuring that policies are equitable across the Faculty. As with other forms of assessment, Examination Boards should have information on the scrutiny given to the marking of each assessment.

APPENDIX F   **INTERDISCIPLINARY RUBRICS**

The use of a rubric in an interdisciplinary module can add to the clarity and understanding of the coursework by the student. A rubric, especially if introduced at the start of the course, can be used as a map to understanding and help students to effectively blend the multiple disciplines found in the course together.

A key paper on the use of interdisciplinary rubrics is Mansilla's on rubrics for interdisciplinary writing (Mansilla et al., 2009). Mansilla's study set out to create a rubric that can be used for courses that cover a range of content. This rubric sets out four key criteria for the assessment of student writing in an interdisciplinary course: (a) purposefulness, (b) disciplinary grounding, (c) integration, and (d) critical awareness or metacognition. These criteria are described as follows:

> Interdisciplinary Understanding: can range from lacking clarity of purpose and audience and fails to draw on disciplinary insights (naive) to writing that demonstrates a clear sense of purpose and a sophisticated synthesis of the disciplines of the course (master).
> Purposefulness: asks two key questions:
>> Does the student's framing of the problem invite an integrative approach?
>> Does the student use the writing genre effectively to communicate with his or her intended audience?
> Disciplinary Grounding: examines students' understanding, selection, and use of bodies of expertise that inform their work.
>> Does the student use disciplinary knowledge accurately and effectively (eg concepts, theories, perspectives)?
>> Does the student use disciplinary methods accurately and effectively? (eg experimental design, philosophical argumentation, textual analysis)
> Integration: Four key questions:
>> Does the student include selected disciplinary perspectives or insights from two or more disciplinary traditions that are relevant to the purpose of the paper?
>> Is there an integrative device or strategy (e.g. a model, metaphor, analogy) at the heart of the work?
>> Is there a sense of balance in the overall composition of the piece with regard to how the student brings the disciplinary perspective or insights together to advance the purpose of the piece?
>> Do the conclusions drawn by the student indicate that understanding has been advanced by the integration of disciplinary views?
> Critical Awareness: students' capacity to take a meta-disciplinary perspective on their interdisciplinary work and reflect **explicitly** about the craft of weaving disciplines together.
>> Does the student show awareness of the limitations and benefits of the contributing disciplines and how the disciplines intertwine?
>> Does the student exhibit self-reflection?

Each of these four criteria are marked on four levels: naive, novice, apprentice, or master. The rubric can be used multiple times, thus allowing students and staff to track learning across the module and can be used to clearly indicate next steps for improvement. This rubric can also be paired with a content specific rubric as the pairing of the two may be the most efficient way to communicate all learning goals.

MANSILLA, V. B., DURAISING, E. D., WOLFE, C. R. & HAYNES, C. (2009) Targeted Assessment Rubric: An Empirically Grounded Rubric for Interdisciplinary Writing. *The Journal of Higher Education,* 80**,** 334-353.