LEAF

"Leading Enhancements in Assessment and Feedback"

Introduction to

Curriculum Mapping

and

Assessment Blueprinting

What is LEAF?

LEAF is the Leading Enhancements in Assessment and Feedback project. It is an ambitious collaborative project looking at curriculums and assessment across the full undergraduate degree programmes, across multiple subjects and Colleges, and across four universities (Glasgow, Edinburgh, Nottingham and Birmingham). Key to LEAF is exploring the balance of efficiency and effectiveness of assessment to look at ways that assessment in different subjects can achieve more in terms of both evaluation and learning and reducing overload for both staff and students. To do this we have adopted (and further developed) a process known as curriculum mapping and assessment blueprinting (CMAB). The following is an introduction to CMAB and how it aims to work with subjects to help meet the LEAF objectives of making assessment a better experience for everyone.

What is Curriculum Mapping?
Degree programmes need to fulfil a range of requirements in terms of aims and outcomes, such as benchmark statements, graduate attributes, national qualifications, or professional accreditation needs. Each course in a programme is expected to contribute to this, but no one course can cover it all. Add to this the fact that students can select many different paths through one or more programmes, and that many programmes share early courses with other programmes, and it can become very difficult for staff to ensure that each student has a chance to meet all of the aims and outcomes set out for the subject.

Curriculum mapping and assessment blueprinting (CMAB) is a process which aims to help with this, by making it easier for staff in any subject to: reduce teaching and assessment overloads (for staff and for students), make teaching and assessment more effective overall, and to see if anything important is being accidentally passed over during the course of a degree.

CMAB may sound daunting, but in fact it is very simple. The mapping aspect is just taking a look at what each course is doing in terms of the aims and outcomes of the full programme and in relation to other courses. The focus is on Intended Learning Outcomes and Graduate Attributes. Assessment blueprinting then is the related process of looking at the assessment in each course, again in terms of the whole programme and assessment in other courses. The curriculum map informs the assessment blueprint through alignment of objectives to assessments. This is done as a collaborative, staff-led project, so that the curriculum stays at home.

What Does CMAB Help Academics to Achieve?

The list below shows some of the most common benefits of CMAB. If done well, each course within a subject, as well as the whole programme should be able to see enhancements to some or all of the following:

- Greater *explicit* student awareness of programme aims and outcomes, and graduate attributes (Gibbs et al., 2010),
- More authentic/effective assessment (Marshall et al., 2010),
- Reduction in assessment workloads/overloads for staff and students (Marshall et al., 2010),
- More time to focus on teaching and formative assessments,
- Easier to incorporate graduate attributes with subject objectives,
- Greater transparency allows more staff interoperability/cooperation (Galvin et al., 2013),
- Easier to place a new course or to ensure losing one does not leave a gap,
- Easier to meet subject benchmarks and professional and national qualifications.

How are the benefits of CMAB achieved; what makes them work?

Here are a few of the ways that this process makes the benefits of CMAB into a reality:

- By collaboratively developing a resource for defining which assessments are most efficient for staff to set and mark, but which also really do enhance and rate student learning (Marshall et al., 2010),
- By integrating ILOs between separate courses as well as to the full programme,
- By raising awareness of programme aims and outcomes and the place of each courses within them (Galvin et al., 2013),
- By raising awareness of the relationship between each course and other courses (Galvin et al., 2013),
- By allowing this awareness to be passed on to students, enhancing learning and reflection (Nicol, 2010),
- By highlighting any areas of assessment overlap, or aims and outcomes not assessed (Marshall et al., 2010),
- By providing an interactive forum for discussion of the whole programme and each part (Galvin et al., 2013),
- By building a scaffold/framework which can organise without controlling.
  - Although the map helps indicate ILOs for each course within the programme, and the blueprint helps to show what types of assessment have already be used or not used by other courses, neither suggests how any course should be taught, or even what courses should be taught.

Examples from other Universitas 21 institutions who have implemented CMAB

Case 1: University of New South Wales

In 2010 the University of New South Wales (UNSW) began a broad and ambitious project which quickly became a beacon for assessment review and curriculum mapping. The project was focused on "efficient and effective assessment" rather than curriculum mapping expressly. A comprehensive campus-wide audit and reworking of assessment in each faculty was conducted over three years. It is because the project took a programme-wide, rather than course-centred, approach to assessment that the project has been retroactively associated with curriculum mapping. The UNSW project was ground-breaking in its scope, and in the end showed considerable improvements in assessment workloads and assessment quality for staff and for students (Marshall et al., 2010). But there were also caveats and in some faculties the project did not do as well as others. This was attributed to the massive scale of the project, and the top-down approach that this required. A number of other universities have implemented similar projects (O'Neill, 2009). One such, which seems to have had good results, is University College Dublin (see **Case 2**).

Some key points and outcomes of the UNSW project were:

- Ambitious scale, covered all faculties (not all programmes within each faculty),
- Top-down approach, participation was mandated,
    - Some subjects bought into the process, but others resisted or saw little point,
- Held large multi-faculty workshops to implement the process,
- Employed focus groups to evaluate progress,
- Subjects led their own reviews and analysis, using different tools and processes
- Promoted university-wide increase in awareness and focus on assessment quality,
- Promoted use of online assessment methods to increase efficiency.

Case 2: University College Dublin

University College Dublin (UCD) recently began a more direct 'curriculum mapping and assessment blueprinting' project, focusing on the strengths and weaknesses of existing models and on a strong link between mapping and assessment (Galvin et al., 2013). UCD's design moved away from large top-down models such as UNSW (although UNSW was a major inspiration for the project). Instead they focused on the need to engage with the complete staff at all stages, and to receive early and continuous involvement from subjects at all levels of management (Sumsion and Goodfellow, 2004). It was seen as both a matter of top down structural change and bottom up pedagogic change. What is most important is that the response was overwhelmingly positive. Even where specific curriculum change wasn't called for, staff still praised the chance to get together and be involved in what the curriculum was and where it was going.

Some key points and outcomes of the UCD project were:.

- Facilitated through subject-specific workshops, guided by Academic Developers,
- Did not initially include subjects where dual-honours was a likely issue,
  - Geography (humanities) has recently become involved,
- Subjects had volunteered for project, rather than being selected,
- Maps and Blueprints made collaboratively by most or all of the staff involved in everyday teaching,
- Voluntary buy-in at ground level was high and sustained,
- An on-going and revisited effort,
- Did not focus specifically on student experience,
- Staff proclaim a number of benefits such as increased awareness of programme, increased sense of community,
- Staff have been very positive about process.

The TESTA Model

A starting point for many CMAB projects, especially in the UK, has been a process called TESTA. "The TESTA project supports research into the effects of interventions to change assessment at a programme level."(Gibbs et al., 2010).

It is a model for approaching CMAB in a programme. The first step is evaluating the existing course and programme documents. This is followed by consultations with staff, and then surveys supplemented by focus groups with students. TESTA is regarded as an audit and intervention process, but can be easily modified to be an enhancement based collaborative effort instead, as was done at University College Dublin.

TESTA at Glasgow

TESTA does have certain limitations, however, which relate to the types of programmes Glasgow offers most. "As far as possible TESTA has researched single subject degrees where there is a consistency of student experience…"(Gibbs et al., 2010). At Glasgow this is not likely to well represent any programme that is not strictly a professional one. In the Colleges of Arts and of Social Sciences dual-honours degrees are quite common, as are wide variations in course selection by students even in single honours – any consistency of student experience would be limited to broad concepts of the subject. In the Natural and Life Sciences there is arguably more consistency within a single programme, but many programmes share a number of core courses (such as Science Fundamentals), which makes it difficult to isolate any programme to be looked at separately. Although the goal of a CMAB project is the enhancement of a particular programme, in both cases it is not reasonable to consider them in isolation as this will not give an accurate picture of how learning and teaching are really taking place. TESTA can provide a strong foundation for a CMAB project at Glasgow, but unmodified it would leave out much of the practical issues and character of the programmes here.

How the Curriculum Varies in Glasgow Programmes (History and Pharmacology):

Year	History (single-honours)		
1	History	Elective	Elective
1	History	Elective	Elective
2	History	Elective	Elective
2	History	Elective	Elective
3	History	History	Arts Elective
3	History	History	History
4	History Special Subject		
4	History	Dissertation	

Single-Honours History

Here the programme to be mapped has the most control of the curriculum over four years (~63%).

But even here students select only 7 courses from dozens of History options in the final 2 years.

Year	History/Literature (dual-honours)		
1	History	Literature	Elective
1	History	Literature	Elective
2	History	Literature	Elective
2	History	Literature	Elective
3	History	Literature	Literature
3	History	History	Literature
4	History	History	Literature
4	Dissertation (History OR Literature)		Literature

Dual-Honours History

In this very popular study path the programme to be mapped has much less control of the curriculum over four years (~37 - 46%).

The actual balance can be even more variable as students can lean more or less to either programme

Year	Pharmacology			
1	Chemistry I (25+)			Elective
1	Biology I (19+)			Elective
2	Human Physiology (19)	Human Form & Function (19)	Life Science Elective (19)	Elective
2	Drugs and Disease (19)	Neuroscience & Behaviour (19)	Life Science Elective (19)	Elective
3	Pharmacology Core			
3	Integrated Human (4)			
4	Pharmacology	Biosciences Elective (4)		Biosciences Elective (4)
4	Pharmacology Project	Pharmacology Paper		Biosciences Elective (4)

Pharmacology

In Life Sciences programmes, such as Pharmacology, students have a more proscribed set of courses options. All through, however, most courses are shared by several other programmes (the number in parenthesis shows an estimate of how many programmes share each course). Pharmacology independently only controls ~25% of the curriculum.

Any changes made in order to map Pharmacology would affect each of these other programmes as well.

How can CMAB be applied at Glasgow University?

CMAB is a learning process in itself; it is not a set of regulations and guides to follow and check off. It is a collaborative process where teachers and subject staff can discuss and develop the programme together, with help offered from experienced learning and teaching researchers. Although the process would be customised to meet the specific needs of each School or subject, a curriculum mapping project will normally go something like this:

- An initial review of ILOs and course and programme guides, by the project research assistant in conjunction with subject staff, as well as initial staff surveys of assessment in courses. These are combined in a chart/spreadsheet which shows all of the courses together along with the programme aims and outcomes. Following the modified TESTA model, this is the beginning of the map and blueprint; the groundwork on which it is built;
- The real core of the process is done in workshops attended by the subject staff and facilitated by the project lead/research assistant(s). You have a chance to discuss corrections and clarifications to the chart as needed, and to work together to design improvements such as filling assessment gaps or reducing excessive assessment of the same ILOs. The research assistant(s) will facilitate and help the process, but do not direct the outcome. This keeps ownership of the curriculum with the staff who run it every day;
- Staff can change over time, as do courses, student needs, and external circumstances. CMAB workshops should be held periodically (perhaps annually, bi-annually or as requested) to make sure good plans keep becoming better, instead of being forgotten;
- In order to help ensure the results stay explicit and accessible, the mapping outcomes can be set online. This would allow all staff to view the relationships between courses, ILOs and assessment at a glance.

Sample CMAB tables (3 year programme)

Table 1: assessment summary
The following table presents an overview of a science programme. It characterises the experience of a Single Honours student over three years of assessment. BSc take the same modules in years 1 and 2 but deviate in year 3. This data provides a broad view of the course and can be compared with student-reported experiences of the course.

	Year 1	Year 2	Year 3	Total
No. of students BSc	43	61	31	135
Type and number of assessment	Lab work proformas 31 Tutorials 21 Class test 3 EBL 1 Report writing exercise 2 (2) IT skills 1 Exam 6	Lab work (pre lab, notebook & report) 72 Tutorials 12 Class test 3 Computation 6 Presentation 1 Scientific outlines 2 Report 1 Exam 3	Worksheet 6 Project skills 4 Literature survey 3 Lab report 20 Assignment 2 Workshop 5 Exam 7	-
No. of assessment tasks overall	67	100	23	190
Variety of assessments	6	9	7	-
Proportion of exams to coursework	6/67 (9%) 11.5 hrs of exams	3/50 (6%) 11.5 hrs of exams	7/23 / 7/33 (30% / 21%) 14 hrs of exams	-
Estimated oral feedback	3.5 hours	2 hours	0 hours	5.5 / 1.8 hours
Estimated written feedback per student (words)	1300 words	1735 words	1950 words	4985 / 1661 words

Table 2: assessment timeline

Table 2: Timeline of assessment and feedback: Dark squares represent the due date of assessment and are colour coded for the type of assessment handed in. The types of assessment are represented by the different colours. The lighter cells which follow represent the time for feedback to return. On courses with fewer assessments, this table should show one line per module.

| 24-Sep | 01-Oct | 08-Oct | 15-Oct | 22-Oct | 29-Oct | 05-Nov | 12-Nov | 19-Nov | 26-Nov | 03-Dec |
| M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F |

| 07-Jan | 14-Jan | 21-Jan | 28-Jan | 04-Feb | 11-Feb | 18-Feb | 25-Feb | 04-Mar | 11-Mar | 18-Mar |
| M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F |

| 22-Apr | 29-Apr | 06-May | 13-May | 20-May | 27-May | 03-Jun | 10-Jun | 17-Jun | 24-Jun | 01-Jul |
| M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F | M T W T F |

Legend:
- draft lab report
- lab work
- tutorial
- lab report exercise
- class test
- worksheet

Table 3: assessment and feedback detail

This table presents a students' module-by-module view of assessment load, format and methods and modes of receiving feedback. It shows the detail of each assessment connected to the submission and feedback processes involved. It also provides the data to populate the feedback summary in Matrix 2.

Module	Assessment		Submission		Feedback			
	description	%	method	deadline	date	method	source	mode
BIO132	Handling Microorganisms (Group 2)	10	Online	08-Oct	05-Nov	Feedback proforma	PG	Class
BIO132	Handling Microorganisms (Group 1)	10	Online	11-Oct	08-Nov	Feedback proforma	PG	Class
BIO132	Quantitative Analysis (Group 2)	10	Hard copy to Bio reception submission box	18-Oct	15-Nov	Marked work returned with comments	staff	Moodle
BIO132	Quantitative Analysis (Group 1)	10	Hard copy to Bio reception submission box	22-Oct	19-Nov	Marked work returned with comments	staff	Moodle
BIO132	Semester 1 Tutorial Essay	10	Online	19-Nov	03-Dec	Feedback proforma, tutorial advice on how to improve essay and comments on work	staff	Etc.
BIO132	End of Module Exam	60	Exam	08-Jan	TBC	TBC		
BIO132	Semester 2 Tutorial Essay	10	Online	07-Feb	07-Mar	Feedback proforma, tutorial advice on how to improve essay and comments on work		
BIO145	MCQ Test	7.5	Test	31-Oct	28-Nov	Personalised online feedback		
BIO145	Evolution Practical	7.5	Submit to JP in lecture	31-Oct	31-Oct	Peer marking		
BIO145	Owl Pellet Practical (Group 1)	7.5	Hard copy to Bio reception submission box + online submission	20-Nov	08-Jan	Generic feedback online before Chirstmas and marked work returned with comments		
BIO145	Owl Pellet Practical (Group 2)	7.5	Hard copy to Bio reception submission box + online submission	27-Nov	08-Jan	Generic feedback online before Chirstmas and marked work returned with comments		
BIO145	Entomology Practical (Group 1)	7.5	Hard copy to Bio reception submission box	20-Nov	08-Jan	Marked work returned with comments		
BIO145	Entomology Practical (Group 2)	7.5	Hard copy to Bio reception submission box	27-Nov	08-Jan	Marked work returned with comments		
BIO151	MCQ Test	15	Test	28-Nov	03-Dec	Generic feedback to whole class with personalised on line feedback to be returned by 07.12.12		
BIO151	Assessed Practical (Group 1)	15	Hard copy to Bio reception submission box	12-Nov	07-Jan	Mark scheme with explanations on Web CT, marked work returned		
BIO151	Assessed Practical (Group 2)	15	Hard copy to Bio reception submission box	19-Nov	07-Jan	Mark scheme with explanations on Web CT		
BIO151	End of Module Exam	70	Exam	07-Jan	18-Feb	Marks and generic feedback on WebCT		

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