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Mapping Graduate Attributes

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A programme-wide approach to assessment: a reflection on some curriculum mapping tools

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Abstract

Developing valid and reliable approaches to assessment that are efficient with staff and students' time can be a challenge in today's higher education institutions. Knight (2000) describes the tension between developing valid complex assessments and the time and economic resources associated with ensuring reliability in assessments. The learning styles, multiple intelligence and inclusive learning literature supports the use of a range of different types of assessments to suit the different learners, yet how can staff do this in a systematic way that doesn't exhausted themselves and the students in the process? This before they consider increasing the level of formative assessment, i.e. giving feedback to students (Juwah et al, 2004).

One solution to these dilemmas is to take a programme-wide approach to assessment, ensuring that over the duration of a full programme students will: have adequate opportunity to be assessed in different ways; receive on-going feedback on their progress; be ensured of a valid and reliable final outcome; and be assessed in both simple and complex tasks. Among others, authors such as Knight (2000) and Diamond (1998) have proposed some curriculum mapping tools to support in the design and monitoring of assessment at programme level. In addition, institutions such as Murdoch University, Australia have implemented an electronic tool, mapping assessments to their programmes' graduate attributes. This paper will compare and contrast a variety of mapping tools to inform the reader who may be considering taking this programme-wide approach. The tools will be explored in relation to how they are used; where they are used; and what type of information they are producing. In addition, the paper will explore the challenges in approaching assessment from the 'lens' of a programme, particularly in relation to academic autonomy and the current focus on assessment at module level.

Introduction

Developing valid and reliable approaches to assessment that are efficient with staff and students' time can be a challenge in today's higher education institutions. Knight (2000) describes the tension between developing valid complex assessments and the time and economic resources associated with ensuring reliability in assessments. The learning styles, multiple intelligence and inclusive learning literature supports the use of a range of different types of assessments to suit the different learners, yet how can staff do this in a systematic way that doesn't exhausted themselves and the students in the process? Keenan and O'Neill in a study on assessment practices in University College Dublin found that staff and student overload was a significant feature of assessment practices (Keenan & O'Neill, 2008). This issue can be confounded by an additional need to consider increasing the level of formative assessment, i.e. giving feedback to students (Juwah et al, 2004).

One solution to these dilemmas is to take a programme-wide approach to assessment, ensuring that over the duration of a full programme students will: have adequate opportunity to be assessed in different ways; receive on-going feedback on their progress; be ensured of a valid and reliable final outcome; and be assessed in both simple and complex tasks. Among others, authors such as Knight (2000) and Diamond (1998) have proposed some curriculum mapping tools to support in the design and monitoring of assessment at programme level. In addition, institutions such as Murdoch University, Australia have implemented an electronic tool, mapping assessments to their programmes' graduate attributes (Lowe & Marshall, 2004). Graduate attributes, however, is a contentious issue (Lowe and Marshall, 2004) and there is a need to reflect on how best these could be used to map assessment practices in a curriculum. This paper therefore will reflect on the following questions:

1) What are the advantages and challenges to exploring assessment at programme level?

2) How does a sample of curriculum mapping tools compare and contrast in relation to how, when and where they are used?

Programme-Wide Approach to Assessment

In an age of modularisation, there is a danger that the sum of the parts (modules) doesn't equal the whole (programme). With academic staff given ownership of modules, the overview of the programme can be in danger of becoming fragmented. Who is looking and has ownership of the whole picture? Proponents of curriculum design emphasise the design of assessment methods early into the curriculum design process (Fink, 2003; Diamond, 1998; Toohey, 2000). For example, Fink (2003, p63) outlines some key questions to consider at the start of the programme design process which emphasise the role of assessment in this activity:

> *'What is it I hope that students will have learned, that will still be there and have value, **several years** after the course is over?' (goals)*
> *'What would the students have to do to convince me that they had achieved these learning goals?' (assessment)*

'What would the students need to do during the course to be able to do well on these assessment activities? (learning activities).

The interesting aspect of these questions is that it asks the programme designer to consider what will be valued several year after the programme is completed. I doubt the answer would be that graduates at this stage should be good at writing three hour examinations on knowledge. We need a variety of different methods of assessment to answer Fink's questions. Even for those who would say that knowledge of the discipline is the key aim, Clark and Linn's work (2003) would suggest that knowledge integration itself takes time, energy, varied activities and many opportunities to make connections. Gardiner (1996, cited in Diamond, 1998, p85) also supports the idea that the '*most effective curriculum provides multiple opportunities to apply and practice what is learned'*. So if the literature tells us we need a) to have a variety of assessments, b) to improve feedback to students (formative assessment) (Juwah et al, 2004) and c) ensure that these assessment are both valid and reliable, how do we meet these demands giving consideration to staff and student time and energy? One key solution to this is to be more efficient with our time and have a more programme-wide view of assessment.

There are challenges with a programme-wide approach to assessment and these have been described as the threat to academic staff autonomy over their modules (Knight, 2000); an over-emphasis on module as the unit of learning (modularisation); a teacher-centered approach to assessment that focuses on content and coverage (O'Neill & McMahon, 2005); and a lack of structures or policies with a focus on curriculum planning (Mutch, 2002).

One strategy for approaching the design of assessment at programme level has been to examine the question: what is core for the students to learn by the end of the programme? This has been called a 'backward-design' approach to curriculum planning (Wiggins & McTighe, 2005) and is strongly linked with the idea of graduate attributes. Graduate attributes are often known as key skills, generic attributes, transferable, employability and/or soft skills (when not including discipline knowledge) (Trevelaen & Voola, 2009). Although gaining international credibility, the concept of mapping and implementing graduate attributes across a programme is a contested area, in particular around issues of accountability, discipline differences in their relevance and meaning, staff disengagement (in particular in non-vocational courses) (Lowe & Marshall, 2004; Sharp & Sparrow, 2002).

In contrast to mapping programme assessment to graduate attributes, Knight (2000) suggests a different programme-wide strategy to mapping assessment to a programme that addresses the validity and reliability dilemma. Knight recommends viewing programme assessments in relation to the use of high and low stakes assessments and suggests how these can be used more efficiently across a programme (See Table 1).

Table 1: Strategy for Assessment of a Programme (Knight 2000)

1) To recognise that some things cannot be reliably assessed and devise alternative ways of making information available to stakeholder
2) To invest in reliable assessments of what can be and needs to be reliably assessed ('high stakes assessment')
3) To recognise that assessment is not primary a tool for awards, but also an aid to student learning ('low stakes' assessment)
4) To use resources freed up by (3) to do (2)

Critique of a selection of curriculum mapping tools

In the literature there are a variety of different tools used to map assessments across a programme. I have chosen four contrasting tools in order to explore the benefits and uses of these in practice, i.e. Diamond, 1998; Sumsion & Goodfellow, 2004; Knight, 2000; Lowe & Marshall, 2004.

a) Diamond (1998):

Robert Diamond's highly referenced practical guide to designing courses and curricula (Diamond, 1998) in American higher education, places particular emphasis on developing a cohesive curriculum. He encourages that the assessment methods be considered in relation to the emerging course goals early in the curriculum design process. Linked with the concept of graduate attributes, Diamond presents a basic competency checklist that may be considered by a curriculum committee to facilitate this task (Diamond, 1998). The checklist *'assigns specific competencies to individual courses (modules) or other formal learning experiences, indicating in which courses the competency will be introduced, used further developed, and assessed.'* These competencies can be adjusted for discipline-specific skills and therefore this list should not be fixed, indeed Diamond encourages the readers to add their own and warns against taking *'any published list of basic skills or competencies and accept for use on another campus without revision'* (1998, p53). He argues if this is to be a success that academic staff must have ownership of the mapping process.

Table 2: Representative of Diamonds' (1998) Curriculum Competency Mapping Form.

Competency (Institutional Specific)	Module	Module	Module	Module	Module	KEY:
Communication	A	A	B	B	C	A: Introduced
Enquiry	A	A	A	A	A	
Creativity	A	B	B	C	C	B: Used
Team-working	A	A	A	A	A	
Problem-solving	A	D	D	D	D	C: Further Develop
Critical thinking	D	D	C	D	D	
Computer literacy	D	D	D	D	D	D: Comprehensively Assessed
Ethics	A	A	B	A	A	
Leadership skills	A	A	A	A	A	
Information retrieval skills	D	D	D	D	D	
Citizenship	-	-	-	A	A	

Diamond's key for mapping the assessment across the programme is simple, maybe even a little too simple. It gives only one option around assessment i.e. is or isn't it 'comprehensively assessed'. It does not transparently mention either formative or summative assessment nor does it mention assessment methods (i.e. exam, posters, essays). It could be argued that formative assessment may be inherent in the first three categories (introduced, used, further developed), which relate to learning activities. However this simple mapping exercise may serve the purpose that Diamond is using it for, i.e. early stage discussions around curriculum planning.

b) Sumsion & Goodfellow (2004).

In contrast to Diamond's early intervention, Sumsion and Goodfellow (2004) carried out a curriculum mapping exercise on an existing curriculum (Bachelor in Education) to identify both the generic skills fostered in the programme and to highlight those that may be overlooked. It compared with Diamond's approach in its focus on graduate attributes. They approached this task in a collegial manner and discovered that the task is not as simplistic as it first appears, for example varied staff perceptions of the different skills and their views on whether or not some should be formally assessed. Sumsion and Goodfellow (2004) designed, based on Gibbs et al (1994) earlier work, a matrix they referred to as the Student Learning Profile. They included institutional skills (attributes) in the Profile, however they allowed other skills to be added. Instead of a broad overview to the programme by a curriculum committee (Diamond, 1998), Sumsion and Goodfellow encouraged a more detailed module-focus to this task working with individual module co-ordinators. The additional detail included a) a descriptor (learning outcome) from the module that mapped with the competency, b) a section whether they thought the competencies was relevant or not, c) a much more detailed key that included whether students had prior knowledge in this area, d) a range of teaching/learning and assessment expectations and e) a section for further comments that often expanded on the assessment method (See Table 3). This approach, whereas it gives much more individual detail on each module, and is clearer in expectations of what is meant in the teaching and learning activity, requires a few pages of information on every module. What it gains on the detail it loses on the overview.

Table 3: The Comparison between Sumsion and Goodfellow's (2004) and Diamond's (1998) Key.

	Sumsion and Goodfellows Key	Diamonds's Key
Relevance	*Tick those generic skills relevant to your unit*	-
Assumed	*Students are assumed to have acquired this skill prior to this unit*	-
Encouraged	*Students are encouraged to gain/practice/refine this skills in this unit*	Used
Modelled	*Modelled for students in this unit by teaching staff and other students*	-
Explicitly Taught	*Explicitly taught to students in this unit*	Introduced
Required	*Students are required to demonstrate this skill in this unit*	-Further Developed/Used
Evaluated	*Students are evaluated on this skill in this unit*	-Comprehensively Assed
Additional Comments		

c) Knight (2000)

Knight approaches this mapping issue from a different angle (Knight, 2000). He argues that due to the multiple purposes of assessment is difficult to have assessments that are economically viable that are both reliable and valid. He maintains that across the timeline of a curricula that there needs to be a trade off between assessing for the purposes of the external stakeholder (high stakes, summative assessment) and those assessments which in order to be valid need to be low-stakes complex assessments (often formatively assessed). He also encourages the use of a range of student, peer and faculty (staff) assessment. Although he uses graduate attributes (or as he describes generic or transferrable qualities), he presents these without reference to the individual module, instead he describes these across the years of a programme. He doesn't describe this approach as a mapping exercise, however it could be usefully used as such, particularly for its strength in presentation of assessment in relation to its function (formative versus summative ; Brown et al, 1997) and by who is doing the assessing (student, peer and faculty). Table 4 represents a summary of his economic and pedagogical argument for keeping the high cost, high stakes reliable faculty (staff) assessment until the later years (see highlight in red in Table 4), in contrast to the more complex generic, low-stakes, peer, self or faculty assessed, assessments in the early years.

Table 4: Representative of Knight's mapping of programme assessments

	Discipline Specific				Generic Transferrable				
	Graduate Attribute	Graduate Attribute	Graduate Attribute	Graduate Attribute	Graduate Attribute	Graduate Attribute	Graduate Attribute	Graduate Attribute	Graduate Attribute
Year 1	√FP FF	√FP FF	√FP FF	√FP FF	√FP FF		√FP FS		
Year 2	√FP FS	√FP FS	√FP FP	√FP FP	√FP FP	√FP FF			
Year 3	√FP FS HSF	√FP FS HSF	√FP FS HSF	√FP FS HSF	√FP FS HSF	√FP FS		√FP FS AI	√ FS AI
Year 4	√HSF	√HSF	√HSF	√HSF	√HSF	√ FS HSF	√HSF	√FP FS AI	√ FS AI

Key: √= Learning opportunities plainly presented in the majority of courses in this year's programme
FP= Formative, low stakes PEER-assessments
FS= Formative, low stakes SELF-assessments
FF= Formative, low stakes FACULTY-assessments
A1= Faculty give feedback and guidance in student advisement interviews
HSF= High stakes FACULTY-Assessments

d) Lowe & Marshall (2004)

The higher education section in Australia has been one of the key international advocates of encouraging the mapping graduate attributes in a programme. Linked with a School Development Process in Murdoch University (embedded in a five year Quality Assurance process), Lowe and Marshall (2004) were involved in the development of an electronic web-based tool for a Graduate Attributes Mapping Program (GAMP) which outlined each unit (module) and then each course's (programme) graduate attributes. They emphasised the developmental nature of this task and commented on how the process initiated other curriculum design discussion with the staff involved in the process. As the Centre for Teaching and Learning were involved in the process they described it as a 'middle-out' as opposed to either a top-down or bottom-up approach (Lowe & Marshall, 2004). This, similar to Sumsion and Goodfellow's (2004) matrix, is performed on existing curricula, however its web-based approach allows staff to print out reports and graphs on the units learning objectives, learning activities, content and assessment as they relate to the institution's nine graduate attributes and 27 sub-attributes.

The recording in this web-based approaches gives details on the methods of assessment (i.e., poster), content (i.e. chiropractic history), learning activities (i.e. practical classes) and learning objectives (i.e. evolution of the chiropractic profession). This gives more detailed information than either Diamond (1998) or Sumsion and Goodfellow's (2004) approach which do not elaborate on the methods of assessment used. In comparison to Knight's (2000)

approach however, this tool does not give details on <u>who</u> assesses or the <u>functions</u> of the assessment, i.e. formative or summative. Its strengths therefore is its ability to easily print out reports, the ease in which staff can quickly see an overview of the methods of assessment used, how they link with the learning objectives and how they all link with the institutions graduate attributes.

Discussion and conclusion

The important of mapping assessment practices across a programme is gaining increased attention as international practices related to coherence in the curriculum is gaining popularity (Knight, 2000; Diamond, 1998). Many have linked this mapping activity to the increasing popularity of the development of graduate attributes, an approach not without its critics (Lowe & Marshall, 2004). There appears to be at the more macro-level a common stance on the general approach to the implementation and benefits of mapping assessments in a programme, however at the more micro-level there are differences in the information gathered for this process.

The first commonality is that the majority of the approaches address not just assessments in the curriculum but also highlight the teaching and learning activities used across the programme. Gijbels et al (2005, p7) would also argue that the traditional view that the assessment of students achievement is separate from instruction, and only comes at the end of the learning process, is no longer tenable. Another common feature in the literature in this area is that although the mapping of assessments, in particular to graduate attributes, can often be initiated by management, it may only be superficially achieved if the academic staff do not become engaged with the process (Lowe & Marshall, 2004). Mutch (2002) maintains that it may be more useful for academic staff to see an emphasis on the ' process' rather than a 'product' of this approach. Lowe and Marshall (2004) also supported this in their approach, which although linked with a top-down quality assurance process had a developmental aspect to it (see also Cummings et al, 2005). In addition, Sumsion and Goodfellow (2004) highlighted that this task can be more complex than appears at first and is more useful for general patterns. The majority of authors who have used graduate attributes as the mapping approach would argue that although having a list of institutional attributes may be a useful starting point, these need to be adjusted and elaborated on for them to make sense to the different disciplines (Ducasse, 2009). '*The importance of the academic ownership of graduate attributes…cannot be overstated'* (Sharp & Sparrow, 2002, p6)

Where these approaches differ is the a) timing of, b) simplicity and c) types of information gathered. In addition the level of involvement of staff in the programme differs. At the simplest end of the scale, Diamond (1998) uses a very simple form that is filled in by curriculum committee to gain brief overview in the planning of a new curriculum. In contrast, most of the other authors have used approaches on their existing curriculum. Sumsion and Goodfellow (2004) and Lowe and Marshall (2004) giving more detailed information. Sumsion and Goodfellow (2004) focusing on whether the graduate attributes are relevant and the extent to which they are taught/modelled in the module, unlike Lowe and Marshall they do not give detail on the methods of assessment used. Knight (2000) is akin to Diamond (1998) in his simple overview of the programme, but differs to all other approaches in his attention to who is

doing the assessing (self/peer/staff) and the function of the assessment (formative/summative). In particular, he considers issues of reliability/validity and cost-effectiveness in his approach to assessment in a programme.

In considering which of the above examples might best suit your own needs in this area, you need to decide a) who and how many people will be involved in the mapping, b) the timing of the mapping in the curriculum design process, b) how the information will be used and shared and c) the purposes of the curriculum mapping. No one approach seems to be ideal but it is possible that one approach (or a combination of more than one) could best suit your own needs and hopefully this paper has gone some way towards helping you make that choice.

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