



“As simple as possible”: the bones of curriculum design

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Einstein is reported to have said, “Everything should be made as simple as possible, but not simpler”. Educational designers working with university teachers bring to their work models and theories from a range of disciplines, many of which are unfamiliar to or discounted by their discipline-based colleagues. This paper outlines a simple yet flexible approach to discussions of curriculum design which highlights key aspects - intended learning outcomes at program and course level, content (*declarative* knowledge), teaching and learning activities and assessment (*functioning* knowledge), and graduate attributes, qualities and capabilities. The Bones Model provides a framework to assist discipline-based teaching academics to describe more clearly their curriculum and the standards to which they hold their students. It demonstrates the links between program-level intended learning outcomes, statements of graduate attributes, and course-level intended learning outcomes. It highlights the most obviously pedagogically relevant purpose for assessment strategies: to collect evidence of how well students have achieved intended learning outcomes. It provides for discussions about the link between *declarative* knowledge and *functioning* knowledge. Moreover, it provides a mechanism to assist the institution to collect some of the evidence necessary to demonstrate quality to external reviewers and auditors. The Bones Model guides discipline-based academics through the essential aspects of the curriculum design process quickly, without requiring of them a deep knowledge of the theories and research underpinning the practice of educational designers and developers.

Keywords: curriculum design, educational design, educational development, Bones Model, university teaching

Introduction

Given recent developments in the Australian funding model for public universities and those implied in proposed changes to current performance-based funding (DEEWR, 2009), it is unfortunate that Australian university teachers are not required to hold a teaching qualification and many have no formal grounding in the theory of education (Ryan, 2010). This presents educational designers with the challenge of finding ways to ensure that university teachers look beyond the content of their own courses and take into consideration context, target audience, intended learning outcomes, desired graduate attributes, assessment of academic achievement, and the appropriate evolution of curriculum.

Educational designers and academic developers spend a great deal of time discussing the characteristics of good university teachers, and how they might support better practice among university teachers. They draw on knowledge and research from more than one discipline area: theories of teaching and learning from cognitivists (e.g. Ausubel, 1960; Bruner, 1990; and Duffy and Jonassen, 1992) and constructivists (e.g. Vygotsky (see Wertsch, 1985), Marton and Säljö, 1976; Papert and Harel, 1991), the fields of knowledge management (e.g. Nonaka and Takeuchi, 1995; Wenger, 1998; Snowden, 2002), educational technology (both as defined by the US-based Association for Educational

Communications and Technology and when used as an abbreviation for "information and communications technologies (ICTs) as they are used in education") (e.g. Richey, 2008; Chickering and Ehrmann, 1996; Salmon, 2000, 2002;), sociology (e.g. Friere, 1970; Illich, 1976) and educational psychology (e.g. Bloom, 1956; Gagné, 1985; Piaget, 1972), and curriculum design (e.g. the linear 'product' models that originated with Tyler (1949); the 'process' models stemming from work by Stenhouse (1976); amendments to the 'process' model to incorporate notions of informed commitment described by Smith (1996, 2000) as 'praxis'; Wiggins and McTighe's model of 'backward design' (1998); traditional instructional systems designers like Romiszowski (1984) and Dick and Carey (1990)) and evaluation (e.g. Brookfield, 1995; Ramsden, 2003). Many of them conduct their own research, adding to the body of knowledge available to their fellow practitioners. The models of curriculum design they call on are adapted to suit policy context, discipline, academic preference and institution. This extensive body of knowledge, under continuous development for decades, is not as widely known in university communities as it could be, especially among academics teaching in disciplines other than education, and perhaps even in that discipline.

This situation does not bode well for Australian universities, particularly following the recent announcement that the Australian Universities Quality Agency (AUQA) will be replaced in 2013 by the Tertiary Education Quality and Standards Agency (TEQSA). Under AUQA, Australian universities were judged according to a 'fit for purpose' model. That is, an institution's performance was audited according to how well it was performing against its own goals. Under TEQSA, their performance will be judged against a set of standards, including teaching and learning. Threshold Learning Outcomes (TLOs) have been commissioned by the Department of Education, Employment and Workplace Relations (DEEWR), and are currently under development in a process facilitated by the Australian Learning and Teaching Council (ALTC)'s discipline scholars as the Learning and Teaching Academic Standards Project. TLOs are expected to outline the minimum standards achieved by graduates.

TLOs need to be read in conjunction with the revisions proposed by the AQF Council for changes to their descriptors of graduate attributes, along with, in certain disciplines, the requirements of professional accreditation bodies. Those institutions that expect their graduates to have achieved standards higher than those described in the TLOs may be required to demonstrate the evidence they have to support such an assertion.

Those who will be faced with the need to review curriculum, academic achievement standards, and teaching practices, as a result of changes to the way Australia's regulatory authority assesses quality and standards, need a model curriculum design that will help them to understand practice in their own institutions and how that practice might be managed, evolved and improved. In a research-intensive university, where academic staff members generally model their own teaching practice on their perceptions of the teaching they observed as students, and where teaching fits in between intensive bouts of highly-focused research activity, the educational designer often has very little time to conduct detailed discussions of curriculum design. The Bones Model emerged from this environment. It is so named because it presents, in a single diagram, the core aspects of curriculum design. It provides a relatively simple way to demonstrate and discuss the relationships between learning outcomes at program and course level, assessment strategies, evaluation strategies, and academic achievement standards. There is room in the Model for discussions about educational technologies, without requiring these discussions to lead or dominate the conversation, as sometimes happens. Rather, discussions of technology use reside within conversations about the delivery of *declarative* knowledge or the facilitation of activities dealing with *functioning* knowledge.

The Bones Model

Biggs and Tang discuss these two kinds of knowledge (*declarative* and *functioning*) in detail. *Declarative* knowledge, they tell us, is propositional knowledge: knowing about or knowing what. "Such content knowledge accrues from research, not from personal experience. It is public knowledge ... verifiable, replicable, and logically consistent". *Functioning* knowledge, on the other hand, is "based on the idea of performances of various kinds, underpinned by understanding". (Biggs and Tang, 2007, p 72) These concepts were key to the development of the Bones Model, as was Biggs' notion of alignment. Biggs describes reflecting on the success of his initial experimentation with portfolio assessment, and deciding that "it [his success] was because the learning activities addressed in the intended outcomes were mirrored in both the teaching/learning activities the students undertook and in the assessment tasks" (Biggs and Tang, 2007, p 52). Many academics, schooled by their research

training to focus first on *declarative* knowledge, put the content of a new or revised course at the heart of their approach to curriculum design. Educational designers, on the other hand, are more likely to focus on the changes engendered in students as a result of the learning experience they have undergone. That is, changes in the way students view the world, improvements to their skills and expertise, or alterations in their behaviour. Both aspects of curriculum design are important.

The strength of the Bones Model is that the educational designer starting a new project is able to open the conversation with any aspect of curriculum design. The Model does not dictate either process or product; rather, it simply provides a map of the elements of a curriculum. Those using the Bones Model are not locked into a rigid linear process with a fixed starting point; rather, the Model facilitates an authentic iterative process while ensuring that all elements of curriculum design are addressed.



Figure 1: The Bones Model: the essentials of curriculum design

Working with the Bones Model, the curriculum design team addresses a range of questions.

- **Course Content:** What information needs to be covered in the course? What are the sources of this information, e.g. published and grey research, review literature, websites, audio-visual material? How can the information be most authentic, e.g. case studies, current research findings from lecturer or colleagues, real-life projects?
- **Program Aims, Goals, Objectives:** Program learning outcomes provide the touchstone for all course learning outcomes, especially for core courses. These are the goals for the whole Program. How do Program Aims mesh with the Australian Qualifications Framework descriptors?
- **Course-level Intended Learning Outcomes:** "On satisfying the requirements for this course, students will be able to ..." How do course-level learning outcomes link to graduate capabilities and qualities? How do Course-level Intended Learning Outcomes mesh with the locally-developed Discipline-specific Core Learning Outcomes and ALTC Threshold Learning Outcomes?
- **Teaching and Learning Activities:** Where and when will students be learning? What learning activities, processes and events will be most effective and efficient in giving students the necessary learning experiences to absorb the course content, apply their newly-acquired *declarative* knowledge, complete activities that demonstrate their *functioning* knowledge, and achieve the course outcomes? These are the learning activities that occur throughout the semester: group activities, field trips, laboratory work, online learning activities, etc.
- **Assessment:** What kinds of assessment will provide authentic measures of how well the student has achieved the course learning outcomes? What kinds of assessment will demonstrate that students are able to apply *declarative* knowledge in completing activities that test *functioning* knowledge? What are the relevant marking criteria and how do these reflect commonly understood standards – for program, course, discipline, profession, College or Faculty, and university?
- **Graduate Attributes, Capabilities, Qualities:** What will graduates be like? What will they be able to do? What skills and expertise will they be able to list on their résumé?
- **Evaluation:** How and when will the program / course be reviewed or evaluated? What will it be judged against? What moderation processes are in place? When is feedback sought from students? How do student comments inform the evolution of the curriculum?

Academic achievement standards

The Bones Model provides a framework that allows for free-ranging conversations about the seven key areas of curriculum design captured in the Model. The Bones Model facilitates debate on the issues at the point at which university teachers are designing curriculum – writing their intended learning outcomes, aligning course aims with program objectives, selecting content, implementing educational technologies, and designing assessment strategies that test students' academic achievements against standards. It is proving useful in helping academic staff to think about how to articulate more clearly the standards to which they hold their students, and to align their own pedagogical standards with those developed at institutional, discipline, and national level.

Conclusions

It is clear that universities will need to provide for TEQSA extensive and comprehensive evidence of how well their programs meet the TLOs that are under development by the ALTC discipline scholars. In one institution, the Bones Model is proving to be a useful tool in linking practices amongst journeyman university teachers and curriculum designers with the wider conversation about academic achievement standards. The extent to which it changes curriculum design practices among university teachers is yet to be demonstrated.

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