

MOR02051

Paper presented at the conference of the Australian Association for Research in
Education

Brisbane, December 2002

Structuring the curriculum for different years of undergraduate programs

Christopher K Morgan

University of Sydney, Orange, NSW Australia

cmorgan@orange.usyd.edu.au

Geoff K Watson

University of Sydney, Orange, NSW Australia

gwatson@orange.usyd.edu.au

Tony McKenzie

University of Sydney, Orange, NSW Australia

tmckenzi@orange.usyd.edu.au

David Roberts

University of Sydney, Orange, NSW Australia

droberts@orange.usyd.edu.au

Kerry Cochrane

University of Sydney, Orange, NSW Australia

kcochran@orange.usyd.edu.au

Abstract

Undergraduate degree programs at universities are normally broken down into discrete units of study. It is usual for students to follow a pathway through their degree that commences with units specifically designed for new students. Those studies become their platform to move onto more intermediate level units before undertaking the more advanced units towards the end of their program. Little research, however, has been undertaken into how universities make their decisions about categorising the 'level' of each of their undergraduate units of study. This paper reports how an investigation of this and related issues in a faculty situation led to a national survey of current practice in the wider Australian university context.

The survey showed that levels of units are a commonly used means of constructing Australian university programs to guide and control the progression of students. Thus the classifying of levels is important for curriculum design, student unit selection, university teaching, and student progression. Despite this, the survey revealed that universities have not developed policies with explicit definitions of what these levels imply and that expectations are not clearly stated nor linked with educational theory. Some thoughts are developed in this paper to begin to address these challenges using the case study context of a faculty situation in which curriculum development requires a more structured approach to determine unit levels.

Key Words

Curriculum; education policy

INTRODUCTION

When universities develop their undergraduate degree programs they seek to structure the curriculum so that students progress from commencement through to graduation in an orderly fashion. Enrolment pathways are constructed around a framework that requires commencing students to undertake studies in areas of work that have been designed specifically for them. These are the foundation studies from which students progress into areas where earlier university learning is presumed. These areas of work are fashioned into units of study (sometimes called subjects or courses) and they are usually arranged in the curriculum in compliance with the perceived degree of difficulty or complexity of the learning in the unit of study. For this purpose units are normally classified into levels.

This paper identifies some issues associated with the process of assigning levels to units of study including the need for a coherent and educationally grounded scholarship on this important area. It then reports on an investigation into current practice by Australian universities. Finally it explores some approaches that universities could develop to structure the curriculum for their undergraduate degrees.

The importance of levels

When faculties review their current degree programs or develop new ones, they need to be able to allocate each unit of study into an appropriate point in the sequence of studies taken

by the students. Some concept of what is appropriate or inappropriate for the units at different stages of the program is essential for this process.

Those designing, offering and undertaking undergraduate degree programs have some common expectations. They expect students, at the commencement of their program of studies, to be undertaking units at a level that reflect foundation studies. It will be expected that they will progress from there to study units at a higher level. To do otherwise would be confounding and cause considerable difficulties. Hence, it is critical for units to be classified into the appropriate level.

Watson et al (2002, p2) have identified additional influences that further compound the importance of this area. They point out that a consistent approach to allocating units to particular levels facilitates the process for students who may:

- enrol in units offered by different faculties within the same university,
- enrol in units offered by different universities and other providers for inclusion as part of their degree
- re-enter a program after a period of absence
- seek credit for studies undertaken elsewhere including the VET sector
- enter postgraduate coursework programs.

Assigning units of study to the appropriate level within undergraduate degrees is a practice common to universities across the world yet there is surprisingly little evidence of published scholarship in this area. In a worldwide literature search undertaken by the authors few instances were found of linkages between the determination of levels of study and a clearly articulated rationale for this determination. Winter (1994) has argued from a UK perspective that the interest in "levels" resulted from the move towards greater flexibility in higher education and the increasing recognition of prior learning. These moves had in turn created new educational frameworks that attempted to link all stages of educational attainment from Certificate through to PhD. As educationalists seek to confront these issues, they demand far more explicit learning objectives and assessment criteria in order to try to provide "credit" systems that are fair to all.

In a UK report by the Further Education Unit (FEU) (1995), levels were viewed as being required to provide learners, practitioners, employers and others with a "straightforward" means of differentiating achievement. Levels were important to enable comparisons to be made and to assist with student progression and transfer.

In the USA at Alverno College, the sequencing of units as determined by levels of learning is perhaps the most sophisticated of its type and is governed by a distinctly different set of assumptions compared to what is more commonplace in, say, Australian universities. The Alverno approach (Alverno College, 1994) integrates the mastery of subject matter with the development of a set of eight abilities, namely: communication; analysis; problem solving; valuing in decision-making; social interaction; global perspectives; effective citizenship; and aesthetic responsiveness. These eight abilities are in turn divided into six levels at which a student is expected to demonstrate attainment as they progress through the course of study. Progression, therefore, is governed by the ability of a student to meet the development criteria assigned to each ability (Alverno College, 1994).

While these outcomes of the literature search revealed progress and insights into levels determination within several overseas contexts, they did not identify any reflective practice within the Australian higher education sector. Accordingly the authors set out to uncover the dimensions of current practice in terms of this issue by universities across Australia. A survey of all universities was designed and undertaken in order to capture a snapshot of the

current thinking and approaches behind determining unit levels within undergraduate programs.

SURVEY OF AUSTRALIAN UNIVERSITIES

All Australian universities were invited in mid-2001 to participate in an electronic survey. A questionnaire consisting of 13 questions was devised as an instrument to gain an overview of the use of levels in Australian higher education.

Method

The intention was to find respondents from each university who were knowledgeable about practices across their university. Accordingly the units of the various Vice Chancellors or Pro Vice Chancellors with specific responsibilities for teaching and learning were usually the first point of contact by telephone to identify the most appropriate person to respond to the questionnaire on behalf of their university. In many cases this led to approaches to directors or other senior professional staff of central offices with teaching and learning service responsibilities. In all cases the respondent was an experienced staff member well acquainted with current practice and policies in their university. While not all universities responded, the majority did so (29 universities responded, a 78% response rate) and sufficient data were received in order to assess the general situation in Australia.

While the survey sought a considerable breadth and depth of response, our intention here is to discuss only responses to those questions that are pertinent to the topic of this paper. More comprehensive analysis of the survey results is being undertaken within a journal paper currently in preparation.

Discussion of results

Survey participants were asked a series of questions relating to the definition of different levels of student outcomes at their university, the application of these in practice by academic staff and the linkages of levels determination to educational theory. In answering our questions all universities indicated that they used at least one system of classifying their units of study into levels.

Q. Are the expectations of student outcomes at the different levels clearly defined at your university? If so, where are these definitions recorded?

While one respondent left this question unanswered, 7% of those who responded were positive and 93% were negative. Even in the cases where there was a positive response, there was no generically defined set of expectations that applied to students studying at different unit levels within an undergraduate course. ***In fact several respondents observed that their institutions did not have a consistent university-wide approach and that different faculties used different systems.***

Some respondents could not identify a university-wide set of guidelines to define expectations at each level within the undergraduate degrees, although expectations of students in terms of learning outcomes, assessment strategies, workload, and assumed knowledge are specified in the guides given to students for each unit of study. In some cases there are defined differences in expectations between undergraduate studies, honours, graduate diploma and coursework masters degrees, but there is no such specified differentiation within an undergraduate

degree. There are, however, expectations of student progression towards a more competent state and the incremental achievement of generic graduate outcomes.

Q. If these differences are not defined by policy what are they understood to be in practice?

Here most respondents reported that there is an implicit but not a common understanding of what the differences between the levels of undergraduate units across a university should be. In some instances faculties or other groups have processes of approval and review where it is expected that some consistency could be imposed. Additionally, a common response to this question was that there is sometimes a clear differentiation provided by the content disciplines. Where there is a group of units of study in the same discipline area, these pathways are often defined and content-sequenced. This enables progressive development of knowledge and skills from foundation studies in the first year through to intermediate level studies and eventually to advanced studies in the later years. This process is often managed by the use of pre-requisites. Several respondents reported that there is a broad understanding among staff that expectations of students [e.g. assessment demands, degree of challenge] increase as they enrol students in units of study at the higher levels. There is often a university requirement that expectations of students are specified in guidance material provided to students in each unit of study.

Q. How is this policy or general understanding conveyed to academic staff?

It was reported that the responsibility for implementing university policy is largely undertaken by the faculties. These policies are frequently on the university web site and/or in manuals given to academic staff. Often various committees and individuals have a monitoring role in which they moderate on standards and provide staff with feedback. Sometimes academic support and development units provide staff with workshops and through these they convey the general understandings and formal expectations. Handbook entries for units of study may describe expectations.

Q. If educational reasoning underpins the approach to assigning levels to units/subjects at your university, briefly outline what that reasoning or educational theory is.

31% of the sample either reported that there was no underpinning educational reasoning or else were unable to answer this question.

In providing their educational reasoning, 28% of respondents made reference to the value of an ordered sequential presentation demanding increasing depth of knowledge and understanding in a discipline with increasing challenge and sophistication of the conceptual approach being applied. Some also mentioned that this approach and the use of pre-requisites allows assumptions to be made about the extent of presumed knowledge among the students.

Another respondent reasoned that the assigning of levels to units can reflect the current perspective of the state of a discipline/profession and how it is evolving. Some said their educational reasoning for specifying levels included assisting students with their unit selections and assisting staff in making appropriate advanced standing decisions.

Some respondents also reported that the assigning of levels facilitates the achievement of the university's expected generic attributes of its graduates. Others referred to a capability framework and the Australian Qualifications Framework. Bloom's taxonomy (Bloom et al., 1956) and the SOLO taxonomy (Biggs and Collis, 1982) were each mentioned once in reference to underpinning educational theory.

Q. Are you aware of non-educational reasons for having levels at your university? If so, what are they?

62% of the sample answered in the negative to this question while another 10% did not respond. The remaining 28% reported the existence of non-educational reasons and of these, 17% of the sample indicated that advantages could accrue from incorporating the levels of units into the student records administration system. Advantages listed included resource allocation, timetabling, grouping students into similar cohorts for statistical and administrative purposes (such as final year students when examining course completion potential) and checking pre-requisite and progression conditions. One mention was made of tradition being a reason for having levels and another indicated the differentiation between undergraduate and postgraduate courses.

The results of this Australian university survey revealed very few links between educational theory and the determination of undergraduate unit levels. The practice of determining such levels seemed to be left in the hands of academic staff in individual faculties rather than linked to any specific university wide criteria enshrined in well-articulated policy. Yet for all this, undergraduate unit levels appear to be a significant feature of the design of Australian university courses and hold major pragmatic implications for student benefits via student progression and certification.

SUGGESTIONS FOR BRIDGING THE GAP BETWEEN PRACTICE AND EDUCATIONAL RATIONALE

It would appear that historically the levels issue has been addressed within individual faculties in a strongly pragmatic manner without explicit reference to educational theory or clearly structured or communicated policy guidelines. In order to bridge this gap between the practice of determining unit levels and the educational rationale underpinning that practice, the authors set about framing some suggestions for possible development. We begin these suggestions with an educational statement that can be framed as follows:

In understanding how to position a unit at a particular level within a program, we are essentially undertaking the process of determining the level at which we want students to engage with this knowledge as learners.

This statement is significant for us because it identifies the importance of embracing both a disciplinary perspective (the knowledge area that is to be explored) and a learner-centred perspective (how the learner engages with the knowledge area in order to construct

personal meaning). We need to consider first the disciplinary standpoint and then discuss the learner-centred perspective.

The disciplinary perspective on levels of engaging student learning

Universities hold a significant role as creators, reservoirs and teachers of disciplinary knowledge. Disciplines in turn are created and maintained via an essential interrelationship between models, tools and relevant contexts and it is these interrelationships that are codified into journals, books and student texts. We have developed the notion of *models, tools and contexts* from the systemic approach to action research methodology offered by Checkland and Scholes (1990, pp19-21; 306). The essence of our notion is that disciplinary propositional knowledge (ie. the knowledge that is developed, retained, and transmitted to successive generations of students) is framed by the concepts and ideas which form *models* or theories of reality that we as disciplinary practitioners use to shape meaning. *Tools* are the means whereby we organise ourselves to apply and test our models and theories, and can include methods, techniques and instruments of all kinds. *Contexts* represent the simulated or real world situations in which we apply and test our models and tools.

The ongoing interaction between models, tools and contexts forms the disciplinary web we ask students to enter into and engage with as learners. From a disciplinary perspective, levels are arbitrary boundaries that disciplinary academics establish or accede to when they define the scope and depth of each stage of student engagement. How these boundaries should be decided lies at the very core of our inquiry but for insights into how these boundaries are determined in current practice, we can begin by referring to the process of creating and marketing academic textbooks.

Student texts are frequently written with student progression in mind. For example, in promoting their texts in the field of Business and Management, the publishers Butterworth-Heinemann have tabulated their offerings by discipline on the criteria of levels of "readership", namely: undergraduate; postgraduate/MBA; and professional (Butterworth-Heinemann, 2001). The undergraduate texts are in turn positioned by level as either "introductory" or "advanced" in this schema. In the case of introductory units, university lecturers and teachers are guided in their choice of texts with phrases such as suitable for "first and second year business students" or suitable for "business studies students meeting the subject for the first time". For subsequent undergraduate units, guiding phrases such as suitable for "advanced level business studies undergraduates" are employed (Butterworth-Heinemann, 2001).

A brief perusal of disciplinary units offered by Australian universities also *indicates the common practice of linking particular units to one or at most two prescribed texts (although in some cases disciplinary units are not linked in this way)*. We would propose that the influence here of the publishing world through defining its "levels of texts" is significant for university academics in specifying the scope and depth required of students when they engage in a particular level of disciplinary learning. This in turn suggests that the alliances between academic authors and publishing editors when texts are commissioned, appears seminal in influencing the boundary decisions on levels that university lecturers and teachers ultimately adopt.

The learner-centred perspective on engaging students

Providing students with disciplinary learning opportunities and encouraging their progress calls for a second major dimension of engagement, one which we are calling here "learner-centred". The disciplinary dimension we discussed above defines the scope and depth of the

interrelationships between models, tools and context that is offered to the learner within a unit level. The learner-centred dimension, however, maps the expectation of how (and to what degree) the learners will be expected to *engage* with this content and *construct* meaning for themselves.

In addressing this dimension of learner-centred engagement we are conscious of the variety of learning models available in the educational literature. These range from taxonomies of learner progression proposed by Bloom et al (1956); to the SOLO taxonomy of Biggs and Collis (1982); the surface and deep approaches to learning of Marton and Säljö (1984); and the constructivist approach of Jonassen et al (1993) among others. A detailed review of the significance of these approaches for defining unit level boundaries constitutes a current 'work in progress' by the authors. However, we can communicate the flavour of this research by focusing on several implications as we see them using the well-known taxonomy provided by Bloom and linking this to the disciplinary dimension discussed earlier.

Linking the disciplinary dimension to Bloom's learner-centred engagement process

Bloom's taxonomy of cognitive objectives presents a sixfold sequence of learner progression, namely: from knowledge (recall), to comprehension, application, analysis, synthesis and evaluation (Bloom et al, 1956). The taxonomy is hierarchical in that the later stages of the sequence subsume the earlier stages and are thus more complex. However, Bloom did not claim that the taxonomy was intended to represent a chronological sequence of long-term stages of learning (eg. years of a degree program). According to Bloom (1956, p.18) his taxonomy was merely a method of differentiating the difficulty of questions within a test at a single point of time. In other words, questions that involved the learner in analysis, synthesis or evaluation were considered quality questions irrespective of whether they were asked of primary school children or in a Master's program.

From this standpoint, sole use of Bloom's taxonomy as a determinant of the 'level' of an educational program is unhelpful: even primary school children engage in analysis, synthesis and evaluation. This conclusion has a further consequence in that it could be argued as well that other learner-centred models may have similar limitations. They may denote student progression within a level and therefore cannot be relied upon to distinguish student accomplishment when students progress to more advanced levels in their units of study.

A way out of this impasse could lie in giving primacy to the disciplinary dimension and then relating the learner-centred models to this schema in a macro sense. A proposal we are currently developing and trialling to achieve this is outlined below.

First we assumed the primacy of the disciplinary dimension (on the basis of its common influence on undergraduate unit levels via textbooks) and then we attempted to define the boundaries of various levels in an undergraduate discipline as follows:

Level 1

Students can *describe* basic models that relate to a discipline and employ tools to apply the models to certain manageable contexts.

Level 2

Students can *analyse* the assumptions underlying models, *assess* the worth of tools and *apply* models and tools to a range of more challenging contexts.

Level 3

Students can *evaluate* the appropriateness of existing models and tools and *design* (adapt/customise) more appropriate ones as necessary. Students can also demonstrate how context specific factors influence the design of models and tools.

Next we returned to Bloom's progression of the learner through various cognitive objectives and attempted to see if these could be mapped in a macro sense onto this disciplinary schema. We found a correspondence as follows:

Level 1

The expectation at this level is that students will engage with this introductory material in a manner that asks them to *comprehend* the new knowledge and be able to *describe and explain it*.

Level 2

The expectation at this level is that students will engage with this more advanced material in a manner that asks them to *analyse* the interrelationship between models, tools and contexts and *apply* this understanding in more challenging situations.

Level 3

The expectation at this level is that students will engage with this advanced material in a manner that asks them to *evaluate* the interrelationship of models, tools and contexts in particular situations and *synthesise and design* original ways via their adapted models and tools to address such situations.

Negotiating the ski slopes of learning levels

The outcome of this mapping process is that we are now able to question the "levels boundaries" for progressively offered units in an undergraduate discipline in novel and more critical ways. We continue to recognise that students can work in a micro sense at higher order cognitive objectives within, say, an introductory level unit. However, the *macro* expectation, viewed from the primacy of the disciplinary dimension, is that they will be required to engage with this introductory interrelationship of models, tools and context, largely at Bloom's description/comprehension level.

An analogy for this situation is the design of the novice learners' slope at a ski resort. Typically such slopes are located close to supportive amenities, are well served by communicative instructors and, above all, offer terrain to negotiate that is within the boundaries of average trial and error efforts of first time skiers. To insist on terrain that asks more than this would seriously disadvantage and deter those learners struggling to master the new concepts and techniques that underpin this challenging sport. In the same way, university academics need to create contexts for novice students that offer sufficient scope for these students to describe and comprehend the concepts and techniques the discipline will embrace. Yet at the same time such contexts must not disadvantage and deter these novice learners as they struggle to negotiate the new and unfamiliar disciplinary territory.

Once this initial grasp of introductory material has been demonstrated, students can more readily cross the description/comprehension boundary and direct more of their attention to analysing the interrelationships of models, tools and contexts together with testing out their analysis in applied ways. This development parallels the upgrading of the novice skier to an "Intermediate" ski slope. Supportive instructors will be present but the terrain is more challenging and the expectations for mastering certain concepts and techniques to cross this terrain are significantly greater. The intermediate slope also offers greater scope for students to become more aware of their motives and natural abilities within this more challenging learning situation.

A new level occurs when students move to "Advanced" ski slopes. Here they need to focus on evaluating and designing approaches to skiing that are appropriate for tackling the higher order challenges that are presented by the steeper grades and the more demanding surfaces they are encountering. Advanced learning situations in a disciplinary context enable students to focus more of their effort into evaluating assumptions and designing and adapting more appropriate models and tools for the situations they encounter. Here, the lower-order cognitive objectives may need to remain in play but the focus of effort has shifted to these higher-order ones.

How are the disciplinary level boundaries defined though? We sense that prescriptive solutions that attempt to cater for all disciplines and teaching environments may not yet be the appropriate pathway. Rather, the way forward seems to lie in recognising that the boundaries are arrived at through a *process* of negotiating the relationship between models, tools and context and appreciating the significance of this relationship for student progression in given teaching environments.

Here we suggest that curriculum designers are likely to engage in dialogues which visualise student progression in a variety of possible ways. For example, progression could mean the acquisition of more detailed knowledge about a disciplinary theory base in the way that, say, economic theory is frequently taught. It could also mean the heightened ability of students to apply disciplinary tools such as input-output analysis within the economics example just referred to. As well it could mean exposing students to a more challenging context in which to demonstrate their knowledge and capabilities. Alternatively it could be any combination of the above. Yet if evolving mastery of the discipline by students is a paramount aim within a program of study, these dialogues and decisions by curriculum designers about engaging students via progressively more challenging linkages between models, tools and contexts become vital issues to research and comprehend. Such insights will enable the definitions of levels boundaries to be more objectively based and understood.

Our view at this point is that university curriculum design can only be enhanced by appreciating the dimensions of the dialogue process across a variety of disciplinary and learning situations. Linking a primary disciplinary model though to appropriate learner-centred approaches has now offered a way forward for us in shaping meaning from these processes - a way forward that did not exist prior to this inquiry.

CONCLUSION

The determination of levels within university undergraduate programs is important because it impacts on the good management of student learning and progression through their programs. In this paper we have argued for the value of the process for assigning levels needs to be undertaken in a coherent, educationally grounded and consistent manner. A

worldwide literature search together with a national survey of Australian universities uncovered few links between current practice and any underpinning educational rationale.

Accordingly an approach has been suggested to offer a way forward and to bridge this gap. The suggestion is based on blending a disciplinary basis for identifying levels of unit content with learner-centred approaches that engage students in more advanced cognitive processes. Given the widespread use of unit levels within university curricula, we suggest that the practice of levels determination is one that now deserves more focused attention and research.

REFERENCES

- Alverno College Faculty. (1994). *Student Assessment as Learning at Alverno College*. USA: Alverno College.
- Biggs, J.B., & Collis, K.F. (1982). *Evaluating the Quality of Learning: The SOLO Taxonomy*. New York: Academic Press.
- Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H., & Krathwohl, D.R. (1956). *Taxonomy of Educational Objectives, Book 1, Cognitive Domain*. New York: McKay.
- Butterworth Heinemann. (2001). *Business and Management 2001- Securing your success with quality books*. Promotional brochure. Oxford. online. Available www.bh.com
- Checkland, P. & Scholes, J. (1990). *Soft Systems Methodology in Action*. Chichester: John Wiley.
- Further Education Unit. (1995). *Framework Guidelines 1: Levels, credit value and the award of credits*. Shaftesbury, Dorset: Blackmore Press.
- Jonassen, D., Mayes, T., & McAleese, T. (1993). *A Manifesto for a Constructivist Approach to Uses of Technology in Higher Education*. London: NATO, ASI Series.
- Marton, F. and Säljö, R. (1984). Approaches to learning. In Marton, F., Hounsell, D., & Entwistle, N. (eds.), *The Experience of Learning*. Edinburgh: Scottish Academic Press.
- Watson, G., Morgan, C., McKenzie, A., Roberts, D. & Cochrane, K. (2002). Meeting the challenge of positioning undergraduate units of study at the appropriate level. Paper presented to the annual conference of the Higher Education Research and Development Society of Australasia, Perth, July.
- Winter, R. (1994). The problem of educational levels (part 2): a new framework for credit accumulation in higher education. *Journal for Further and Higher Education*, 18(1), 92-106.