ALIGNING TEACHING AND ASSESSING
TO COURSE OBJECTIVES

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Teaching as a system

Teaching and learning take place in a whole *system*, which embraces classroom, departmental and institutional levels. A 'poor' system is one in which the components are not integrated, and are not tuned to support high-level learning. In such a system, only the 'academic' students use higher-order learning processes. In a 'good' system, all aspects of teaching and assessment are tuned to support high-level learning, so that all students are encouraged to use higher-order learning processes. Constructive alignment (CA) is such a system. It is an approach to curriculum design that optimizes the conditions for quality learning.

For an example of a poor system, here is what a psychology undergraduate said about his teaching:

> I hate to say it, but what you have got to do is to have a list of 'facts'; you write down ten important points and memorize those, then you'll do all right in the test ... If you can give a bit of factual information – so and so did that, and concluded that – for two sides of writing, then you'll get a good mark.   Quoted in Ramsden (1984: 144)

The problem here is not the student. In fact, this student liked writing extended essays, and finally graduated with First Class Honours, but he was contemptuous of these quick and snappy assessments. So in psychology, he made a strategic decision to memorize, knowing that it was enough to get him through, saving his big guns for his major subject. The problem here is the assessment: it was not aligned to the aims of teaching.

So often the rhetoric in courses and programmes is all that it should be, stating for example that students will graduate with a deep understanding of the discipline, and the ability to solve problems creatively. Then they are told about creative problem solving in packed lecture halls, and tested with multiple-choice tests. It's all out of kilter, but such a situation is not, I strongly suspect, all that uncommon.

What is constructive alignment?

'Constructive alignment' (CA) has two aspects. The 'constructive' aspect refers to the idea that students *construct meaning* through relevant learning activities. That is, meaning is not something imparted or transmitted from teacher to learner, but is something learners have to create for themselves. Teaching is simply a catalyst for learning:

> If students are to learn desired outcomes in a reasonably effective manner, then the teacher's fundamental task is to get students to engage in learning activities that are likely to result in their achieving those outcomes ...It is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does.   (Shuell, 1986: 429)

The 'alignment' aspect refers to what the teacher does, which is to set up a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes. The key is that the components in the teaching system, especially the teaching methods used and the assessment tasks, are *aligned* to the learning activities assumed in the intended outcomes. The learner is in a sense 'trapped': it is difficult to escape without learning what is intended should be learned.

In setting up an aligned system, we specify the desired outcomes of our teaching, in terms not only of topic content, but in the *level of understanding* we want students to achieve. We then set up an environment that maximizes the likelihood that students will engage in the activities designed to achieve the intended outcomes. Finally, we choose assessment tasks that will tell us how well

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individual students have attained these outcomes, in terms of graded levels of acceptability. These levels are the grades we award.

There are thus four major steps.
1. Defining the desired learning outcomes (DLOs)
2. Choosing teaching/learning activities likely to lead to the DLOs
3. Assessing students' actual learning outcomes to see how well they match what was intended
4. Arriving at a final grade

Defining the DLOs

When we teach we should have a clear idea of what we want our students to learn. More specifically, on a topic by topic basis, we should be able to stipulate how well each topic needs to be understood. First, we need to distinguish between *declarative* knowledge and *functioning* knowledge.

Declarative knowledge is knowledge that can be 'declared': we tell people about it, orally or in writing. Declarative is usually second hand knowledge, it is about what has been discovered. Knowledge of academic disciplines is declarative, and our students need to understand it selectively. Declarative knowledge is however only the first part of the story.

We don't acquire knowledge only so that we can tell other people about it; more specifically, so that our students can tell us – in their own words of course – what we have recently been telling them. Our students need to put that knowledge to work, to make it function. To really understand something, you see the world differently, and behave differently towards that part of the world.

I setting objectives, then, there are three points:
1. The criteria, and hence the assessment, must be "authentic" to the discipline. Transformed verbal retelling is not often authentic
2. To *really* understand a topic, concept or principle, changes the way one behaves in the topic area
3. Teachers need to specify such "performances of understanding" (Gardner, 1993) for the material they are teaching

First we get the objectives straight, what students have to *do*. Then we decide how to get them to do it. Assessment serves a double purpose: it checks the quality of learning, and for students, it *defines* what is to be learned.

We want lawyers to make good legal decisions, doctors to make accurate diagnoses, physicists to think and behave like physicists. After graduation, all our students, whatever their degree program, should see a section of their world differently, and to behave differently towards it, expertly and wisely. Thus, simply telling our students about that part of the world, and getting them to read about it, is not likely to achieve our DLOs with the majority of students. Good students will turn declarative into functioning knowledge in time, but most will not if they are not required to.
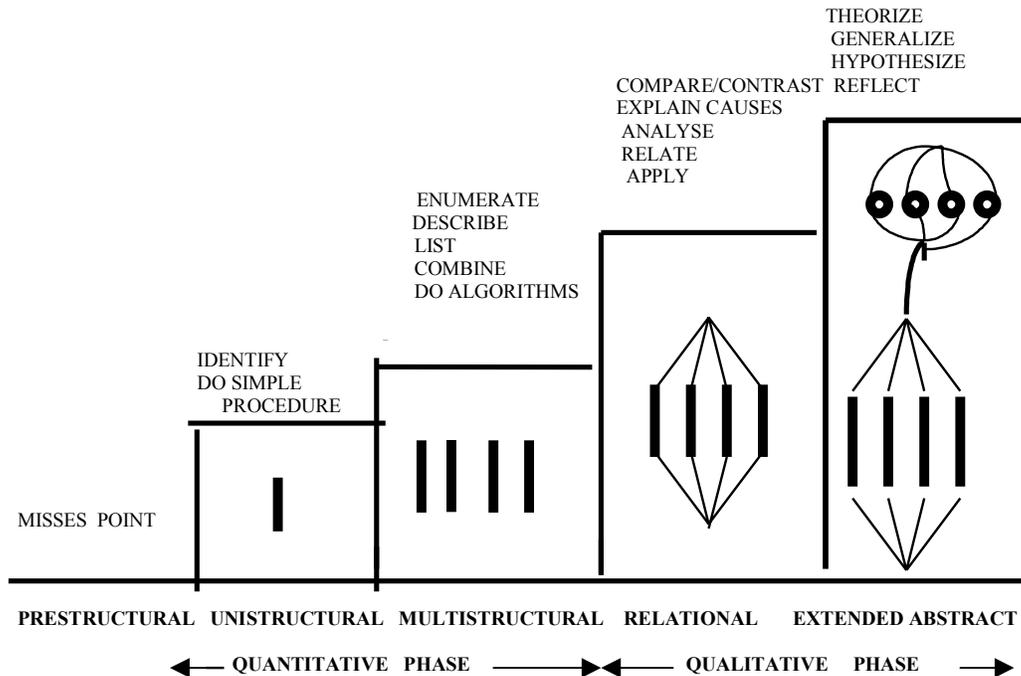
Accordingly, we have to state our objectives in terms that require them to perform their understanding, not just simply tell us about it in invigilated exams. The first step in designing the curriculum objectives, then, is to make clear what levels of understanding we want from our students in what topics, and what performances of understanding would give us this knowledge.

It is helpful to think in terms of appropriate *verbs*. Generic high level verbs include: Reflect, hypothesise, solve unseen complex problems, generate new alternatives

Low level verbs include: Describe, identify, memorize, and so on. Each discipline and topic will of course have its own appropriate verbs that reflect different levels of understanding, the topic content being the objects the verbs take.

Incorporating verbs in our intended learning outcomes gives us markers throughout the system. The same verbs need to be embedded in the teaching/learning activities, and in the assessment tasks. They keep us on track.

The following figure, based on the SOLO Taxonomy (Biggs, 2003) gives a hierarchy of verbs, from lowest level to highest.

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A hierarchy of verbs that may be used to form curriculum objectives

THEORIZE
GENERALIZE
HYPOTHESIZE
COMPARE/CONTRAST REFLECT
EXPLAIN CAUSES
ANALYSE
RELATE
APPLY

ENUMERATE
DESCRIBE
LIST
COMBINE
DO ALGORITHMS

IDENTIFY
DO SIMPLE
PROCEDURE

MISSES POINT

PRESTRUCTURAL   UNISTRUCTURAL   MULTISTRUCTURAL   RELATIONAL   EXTENDED ABSTRACT

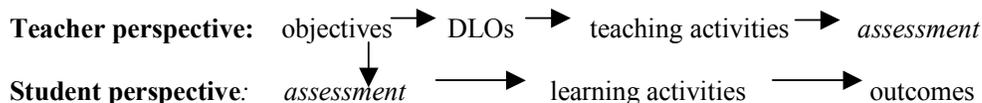◄—— QUANTITATIVE PHASE ——►◄—— QUALITATIVE PHASE ——►

Choosing teaching/learning activities (TLAs)

TLAs in many courses are restricted to lecture and tutorial: lecture to expound and package, and tutorial to clarify and extend. However, these contexts do not necessarily elicit high level verbs. Students can get away with passive listening and selectively memorizing.

There are many other ways of encouraging appropriate learning activities (Chapter 5, Biggs 2003), even in large classes (Chapter 6, op. cit.), while a range of activities can be scheduled outside the classroom, especially but not only using educational technology (Chapter 10, op cit.). In fact, problems of resourcing conventional on campus teaching, and the changing nature of HE, are coming to be blessings in disguise, forcing learning to take place outside the class, with interactive group work, peer teaching, independent learning and work-based learning, all of which are a rich source of relevant learning activities.

Assessing students' learning outcomes

Faulty assumptions and practices about assessment do more damage by misaligning teaching than any other single factor. As Ramsden (1992) puts it, the assessment *is* the curriculum, as far as the students are concerned. They will learn what they think they will be assessed on, not what is in the curriculum, or even on what has been 'covered' in class. The trick is, then, to make sure the assessment tasks mirror the DLOs:

Teacher perspective: objectives ➔ DLOs ➔ teaching activities ➔ *assessment*

Student perspective: *assessment* ——➔ learning activities ——➔ outcomes

To the teacher, assessment is at the end of the teaching-learning sequence of events, but to the student it is at the beginning. If the curriculum is reflected in the assessment, as indicated by the downward arrow, the teaching activities of the teacher and the learner activities of the learner are

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both directed towards the same goal. In preparing for the assessments, students will be learning the curriculum. The cynical game-playing we saw in our psychology undergraduate above, with his 'two pages of writing', is pre-empted.

Matching individual performances against the criteria is not a matter of counting marks but of making holistic judgments. This is a controversial issue, and is dealt with in more detail in Biggs (2003, Chapters 8 and 9). Just let me say here that the DLOs cannot sensibly be stated in terms of marks obtained. Intended outcomes refer to sought-for *qualities of performance*, and it is these that need to be stated clearly, so that the students' actual learning outcomes can be judged against those qualities. If this is not done, we are not aligning our objectives and our assessments.

Common practice relies on

The measurement model

Beliefs

- Knowledge comes in units: a word, an idea, a point
- Each correct unit is "worth" the same as any other unit, so that they may be added or averaged.
- It doesn't matter *what* you get correct, as long as there are (usually) fifty of them.
- Percentages, as ratio or as ratings on scales ->100, make an absolute currency
- Assessment is "scientific": precise and objective
- The distribution of ability determines outcomes

Procedures

- Marking by counting bottom-up
- Averaging marks across assessment tasks
- Assessment separated from teaching
- Standardized conditions, heavy bureaucracy over procedures:
  strict deadlines,
  punishing by deducting marks,
  no revising or second attempts
  common assessment tasks
- Emphasis on decontextualized assessments tasks
- Grading along a predetermined distribution (formal or informal)

Message to students

- Ideas are equally important
- Trees more important than the wood
- Verbatim responses must gain marks
- Attributions to uncontrollable factors: ability, luck
- Assessment is the responsibility of the teacher
- Therefore self-assessment and reflection are unimportant

Some aspects of the measurement model and its quantitative representations of learning are almost universal in current practice. Ironically, many quality assurances procedures exacerbate the situation.

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Modes of assessment

Are final exams, multiple choice tests, or essay assignments the best or even authentic ways of finding out how well the unit objectives have been met? Assessment tasks should involve the desired learnings

Assessment mode ⟶ *Most likely kind of learning assessed*

Extended prose, essay-type

essay exam	rote, question spotting, speed structuring.
open book	as for exam, but less memory, coverage
assignment, take home	read widely, inter-relate, organise apply, copy

Objective test

multiple choice	recognition, strategy, comprehension, coverage
ordered outcome	hierarchies of understanding

Performance assessment

practicum	skills needed in real life
seminar, presentation	communication skills
critical incidents	reflection, application, sense of relevance
project	application, research skills
reflective journal	reflection, application, sense of relevance
case study, problems	application, professional skills
portfolio	reflection, creativity, unintended outcomes

Rapid assessments (large class)

concept maps	coverage, relationships
three minute essay	level of understanding, sense of relevance,
gobbets	realizing the importance of significant detail
short answer	recall units of information, coverage
letter-to-a-friend	holistic understanding, application, reflection
cloze	comprehension of main ideas

Arriving at a final grade

There are two ways to go:

1. Marking, a process that converts nonquantitative data into numbers.
2. Making holistic judgments that match outcomes with qualitative criteria.

(1) is the usual default method, but it is open to all the qualifications and objections listed above under "the measurement model".

(2) requires listing of the criteria for the award of particular grades. The grade is then awarded that best describes a given student's performance.

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An example is given of the objectives and grade criteria for a Master's unit for educational psychologists. In this instance, the final result was required to be reported in percentages, but that did mean it had to be "marked" in percentages.

CURRICULUM AND INSTRUCTION

Course Objectives and Grade Criteria

Grading will be based on your attaining the following objectives:

1. demonstrate that you correctly understand and can apply the principles of good teaching and assessment to chosen contexts.
2. demonstrate a knowledge of selected aspects of curriculum design and management and how they relate to the educational system in Hong Kong.
3. show how the content and experiences in this course may enhance your effectiveness as an EP.
4. show evidence of reflective decision-making

Final grades will depend on how well you can demonstrate that you have met all objectives:

A (70+)**:** awarded if you have clearly met all the objectives, displaying deep knowledge of the base content, original and creative thinking, perhaps going beyond established practice.

B (60-69)**:** awarded when all objectives have been met very well and effectively.

C (50–59)**:** awarded when the objectives have been addressed satisfactorily, or where the evidence is strong for some objectives, weaker but acceptable in others.

F: less than C, work plagiarised, not submitted.

Learning outcomes were graded qualitatively in the first instance, then a "percent" awarded according to how well the student performance matched that grade: a bare "A" for instance would receive 72, a superb A 90, say.

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Aligning curriculum objectives, teaching learning activities (TLAs), and assessment tasks

TEACHING/LEARNING ACTIVITIES	CURRICULUM OBJECTIVES expressed as *verbs* students have to enact	ASSESSMENT TASKS
designed to elicit desired verbs. May be:	**A** Reflect Hypothesise, generate Apply to "far" domains Relate to principle	evaluate how well the target verbs are elicited and deployed in context
teacher-controlled *peer*-controlled *self*-controlled as best suits context	**B** Apply to "near" domains Analyse, compare Explain, solve Understand main ideas **C** Elaborate Classify Cover topics *a* to *n* Describe **D** Learn procedures Name Memorise	

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Table 1: Comparing the Measurement and Standards Models

	Measurement model	Standards Model
Theory	Quantitative. Classic test theory, using assumptions of parametric statistics.	Qualitative. A theory of learning enabling consistent judgments. No assumptions about distributions.
Stability	Scores remains stable over testing occasions.	Scores after teaching should be higher than before teaching
Dimensionality	The test is unidimensional. All items measure the same construct .	Test multidimensional (unless there is only one objective). The items address all of the course objectives.
Testing Conditions	Conditions need to be standard.	Conditions reflect an individual's optimal learning in the intended application of the learning.
Validity	External: how well the test correlates with outside performances.	Internal: how well scores relate to the teaching objectives and to the target performance domain.
Use	Selecting students. Comparing individuals, population norms. Individual diagnosis.	Assessing the effectiveness of learning, usually after instruction.