

# BRIEFING BRIEFER PAPER

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Key  
Learning  
Objectives

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Introduction

We are all becoming familiar with on-line assessments – they are part of most, if not all, of today's on-line learning environments. There are a number of commercial offerings, such as Questionmark™ Perception™, that can be used in place of the VLE-based systems. So surely these tools satisfy all the needs that the community has, or is there still room for improvement?

Obviously on-line assessment development is a very active research area at the moment but there are some relatively simple, highly effective considerations that can be employed to good effect. One key consideration is that assessments should exist within a 'domain' of learning content in which **all** the materials for a programme, a course or organisation, is managed as a coherent whole.

Within any such domain, there may be a few tens of individual publications for a typical programme, such as a Masters programme. Figure 1 shows a view of how individual publications (texts, study guides, assessments, etc.) fit in a fully integrated product view of a domain.

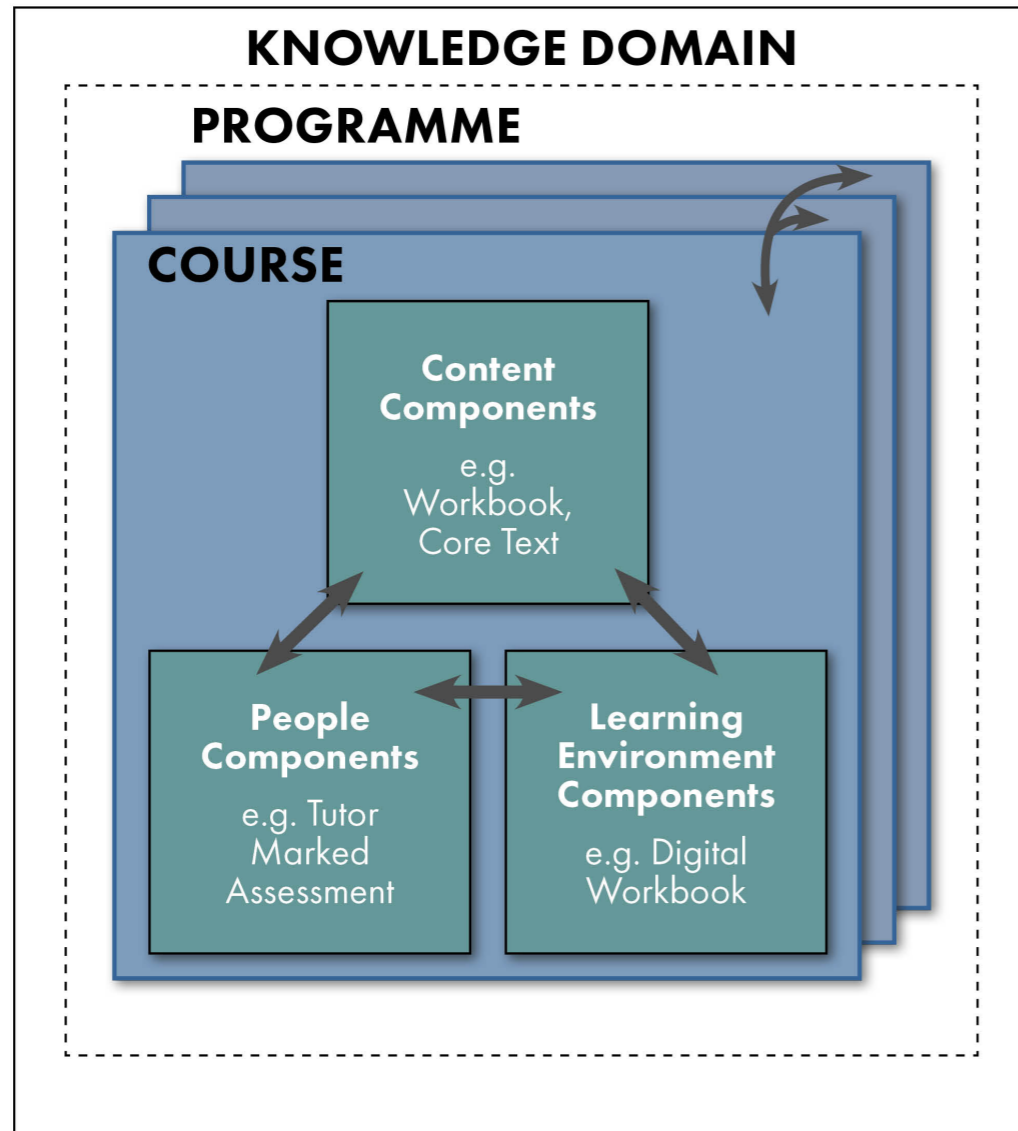


Figure 1: 'Domain' of Learning Materials and Components

Domains are, in essence, a digital repository containing all the learning assets associated with a programme or set of courses, or of the organisation as a whole. All content should be held, where possible, in a standard form, with XML forming the base. Within the 'single master source' paradigm, any bit of information held in such a managed domain is always a 'gold copy'.

Structure is also critical. For any course or programme in such a domain a deliberate and meaningful design for every course is beneficial – as touched on in an earlier briefing paper<sup>1</sup>. Figure 2 illustrates the principle. Note that at the centre of each course is an explicit set of learning objectives – something that every course in every university has!

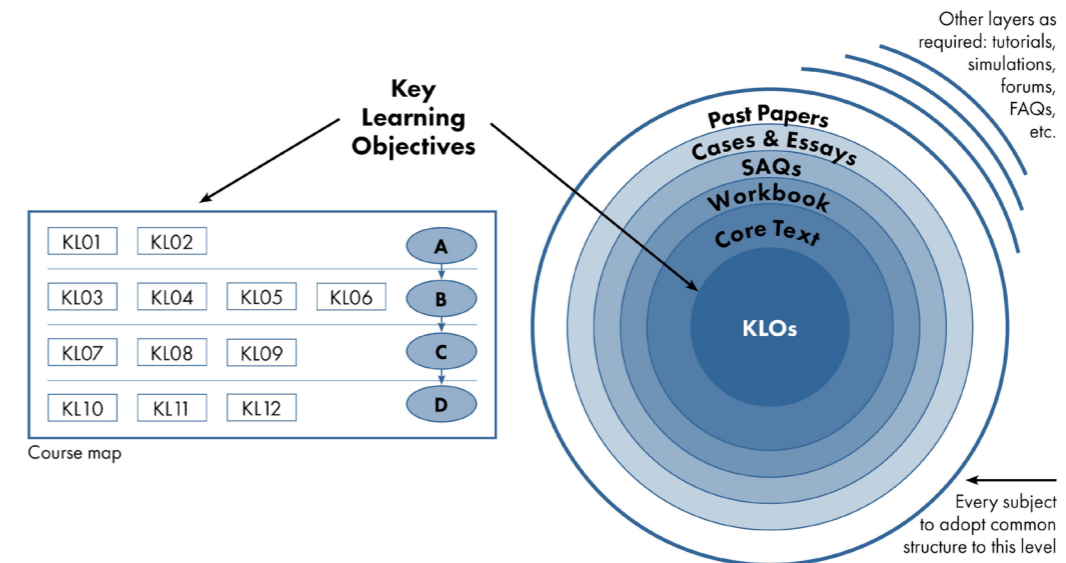


Figure 2: The Course Component 'Onion' encouraging structural consistency

Learning objectives can be put to very effective use, as the following section will detail.

First, let us be clear about what we mean by Learning Objectives (LOs) as they are often used synonymously with Learning Outcomes. There is, we think, a clear difference as Figure 3 illustrates.

Consider, first, a course that carries no assessment – a CPD<sup>2</sup> course perhaps. The Learning Objectives sit at the heart of the overall design of such a course and all content developed to support the course should relate to one or more

<sup>1</sup> See 'Treat All Students As Distance Learners, April 2007 [Briefing Paper](#)

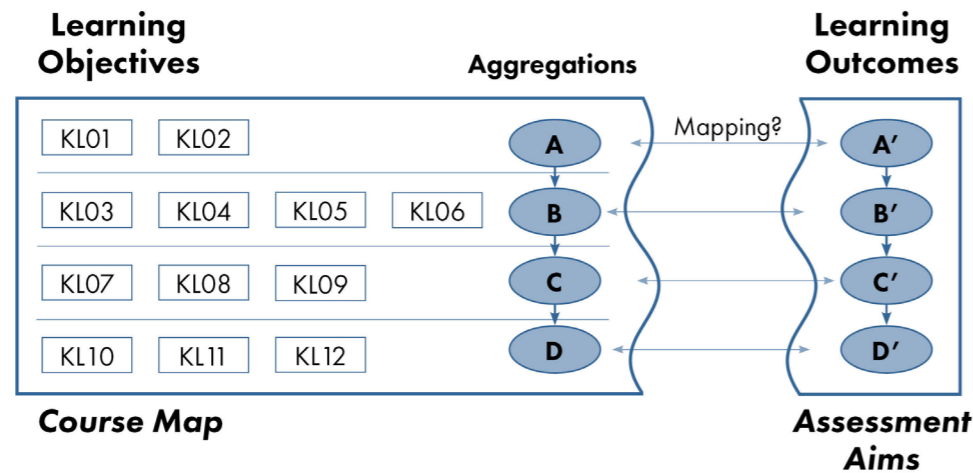
<sup>2</sup> Continuing Professional Development

Are Learning Objectives just Outcomes?

LO. We will say more about this later when we talk about assessments. The LOs themselves offer a structure for the course and, potentially, study paths through the course.

Ultimately they should also offer the student a clear picture of what the course is about and how it might be structured and/or studied. This is very important, as one often quoted reason for poor student retention is a lack of understanding of what was in a course or what it purports to cover<sup>1</sup>.

Typically we might expect somewhere in the region of 10 to 12 LOs for a typical 15 or 20 credit masters level course. Anything more than that and the course is beginning to look a bit complicated. Ideally a student should be able to look at the first page of a course description and get a clear picture of what that course is about. Anything less than this number and the course design will look a bit 'chunky' and subsequently lack clarity of structure.



**Figure 3: Learning Objectives and Learning Outcomes**

In short, establishing the Learning objectives are an essential part the initial design phase of a course.

Now, add in assessment – for example, a written examination. Assessments tend to be constructed with Learning Outcomes in mind. Learning Outcomes are statements that specify what learners should know, or be able to do, as a result of a learning activity – studying a course. Outcomes are usually expressed through terms such as knowledge, skills, or attitudes. Learning outcomes should flow from a needs assessment, which should be designed to determine the gap between an existing condition and a desired condition.

The right hand side of Figure 3 shows how assessment, and hence Learning Outcomes, can be added to the designed course to give an overall assessed course.

<sup>1</sup> See 'Improving Student Retention', [August 2007 Briefing Paper](#)

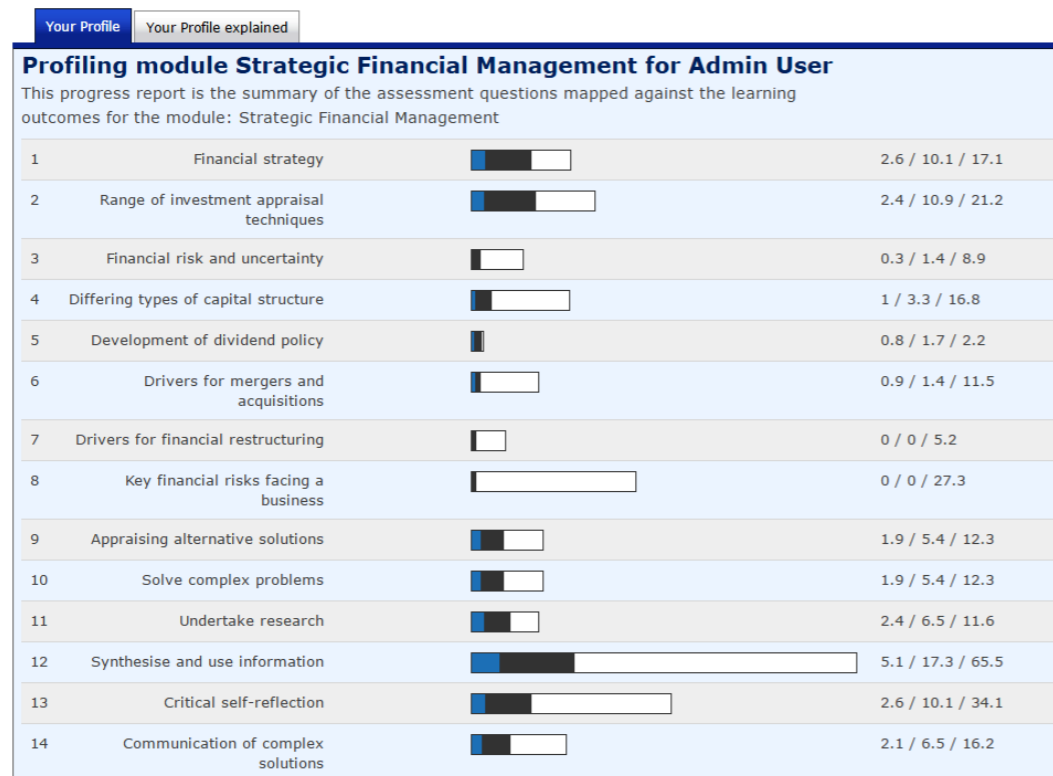
One other thing should be noted. It would be totally wrong to have a complete decoupling of Learning Objectives (probably at an aggregated level) from the Learning Outcomes. While this should not happen, it is easy to see how it might happen in some circumstances. Often the Outcomes are established by one organisation, or body, while the objectives are set and used by another.

For example, in Scotland the SQA – the national body responsible for the development, accreditation, assessment and certification of non-degree qualifications – has overall responsibility for devising, developing and validating these qualifications, and providing accreditation. The SQA establishes the Learning Outcomes. The FE Colleges design, develop and deliver the courses (which need approval by the SQA) so they establish their Learning Objectives, and the course design, to meet the needs of the SQA, i.e. to satisfy the Learning Outcomes.

LOs are an extremely effective mechanism for providing useful and meaningful feedback to students on their progress. They are obviously useful in many other areas, such as generating random, but targeted, assessments for revision. A prerequisite for this, is the added overhead of assigning weighted attributes against each question (which can be of any type) attributing the relevance of the question to one or more of the LOs – the total weighting must sum up to unity.

This is really no overhead at all and, within the parameters of a course designed around key learning objectives, it is capturing the subconscious process that the designers of questions should be going through anyway. We believe that these weighted attributes should be an essential feature as it is one mechanism for ensuring that all materials are actually, and deliberately, relevant to the course being developed. We have seen real cases where materials are being used by academics that cannot be mapped to the course (typically, the reason given is "I've always used that case!"). We have also seen the converse where a course has no questions associated with stated learning objectives.

There is one immediate benefit of building the assessment banks in this fashion, namely that the course developer can see how the 'profile' of his/her questions builds up with respect to each LO. This is illustrated by the white box heights in Figure 4.



**Figure 4: Typical Online Learning Objective Feedback Display**

A more valuable benefit is that as the student works through the formative assessments, they can get immediate feedback on how well they are progressing – they get Progress Reports.

The black boxes in Figure 4 indicate what score they could have achieved, given the stage they are at in the course, but the green shows how much they actually scored. In a well-designed course the student gets a good indicator of where they are weak. This can be also monitored by tutors, if relevant.

Students, tutors and course builders can all get value out of the simple use of Learning Objectives in assessment banks. Additional attributes may be used to good effect and to enhance the course development in particular.

For example, it would be even better if the builder could see not just the volume of questions available for each LO but also have information about the level of learning of each question. Bloom's Taxonomy (or the Anderson & Krathwohl variant) is extremely useful in this respect. If each question also carries an attribute depicting its level of learning in the Bloom Taxonomy then a more accurate profile can be built up.

Bloom's is not the only taxonomy that could be used, the SCQF Level Descriptors are equally relevant though these are perhaps too detailed for the relatively simple use we are advocating here.

Looking again at Figure 1 you will note that a recommended approach is to manage a 'domain' of information comprising all the materials of any course, programme or even organisation. Within this domain, publishing systems can be established which know where every important element of that domain is.

Standards can be employed, particularly XML and DocBook, and information tagged with as rich a set of metadata as possible. This includes a rather simple id for every element of note, whether it is a section, chapter, multiple choice question, case study, etc.

For the content developer, particularly the question bank builder, there are ready mechanisms for linking to relevant content in a publication anywhere in the domain. Typically this will be to relate the answer of a question back to the relevant section of the reference text or the study guide. (However it is possible to link from anything to anything, e.g. an FAQ to an assessment).

Each publication in Figure 1 may be independently revised, which might mean that chapters or sections get moved around in the new version (or, in the worst case, deleted). Smart publishing systems, judicious use of metadata and dynamic linking mechanisms ensure that this is not a concern (except to act to repair deleted links).

We can achieve a total integration of assessments within the full domain of learning content.

This briefing paper set out to illustrate the value of well-designed courses with Learning Objectives at the heart of the designs.

Such an approach offers distinct advantages to the course developers, the tutors and the students. In other briefing papers, we argued that you should treat all students as distance learners as it is typically new design activities, such as that necessary for a DL course, that offer an organisation the opportunity of revisiting, redesigning and redeveloping a course or programme.

Following simple guidelines can add great value to this process. This process should also be seen within the total value-opportunity afforded it in a domain-based approach. It is also a strong catalyst for an organisation to develop a formal, but 'implementable', Knowledge Management Strategy, and to base it on the single master source publishing approach that we advocate.

Single source publishing of distance learning materials isn't a solution for one lecturer wishing to place his or her lecture notes on-line. It is a solution for professionally developing a whole distance learning programme, and scales rapidly to deliver massive cost savings and strategic benefits at the departmental, school and organisational levels.

We build further on the use of Learning Objectives in other briefing papers,

and touch on how they can link directly to the development of competency frameworks which may well equate to the chosen Learning Outcomes.

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