

Designing Courses for Online Distance Learning

A primer for course designers and authors

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Designing for ODL

Online Distance Learning (ODL) has the potential to dramatically change how we teach and learn. It can greatly improve classroom experiences just as much as it can provide economic advantage by lowering costs for online learners and improving value.

Twigg, 2002

This document is a set of guidelines for budding new designers and authors of ODL courses and programmes. Its purpose is to initiate an informed, decision making discussion about how best to do this for the specific target audience of students you wish to deliver successful ODL experiences to.

Designing for ODL is still a relatively new concept. It is not just about *designing* courseware, it is also about *delivering* it. Therefore good quality ODL designs address the whole online learning experience, and consist of a blend of components from three main sources – **content, online learning environments** and **people**.

The first thing we will review is that ODL design, authoring and production is actually a **team based effort**, and depending on the complexity required for the resulting course, quite a number of individual specialists may contribute their areas of expertise, be they programming, illustrating, animating or configuring online learning environments. Designer and author contributions quickly become embedded in the actual production process for the course. As the production team develop the interactive assessments and features specified by the designers and created by the authors and course developers, frequent requests are made of authors to provide more content for specific learning contexts.

It is therefore helpful if everyone involved shares a common understanding of this collaborative ODL **production process**. It helps to explain why things have to be done in specific ways, and to schedule all individual contributions. We will look at a proven information flow, or production, model and consider its real-world use.

Good ODL design is helped greatly by using pragmatic **templates** for commonly used course components that are proven to work well online. We will explore together what templates offer the ODL designer, and how they affect all parts of the course production process.

Finally, we will look at exactly how designing for ODL affects all stakeholders involved in the process from initial concept to final release and use.

It is very satisfying to design a successful piece of ODL, but remember that success comes not from launch, but from repeated use over many months or years. Experienced ODL designers know that good materials evolve with time, and that conducting regular feedback and improvement updates are also needed to ensure continued ODL success.

Design for flexibility

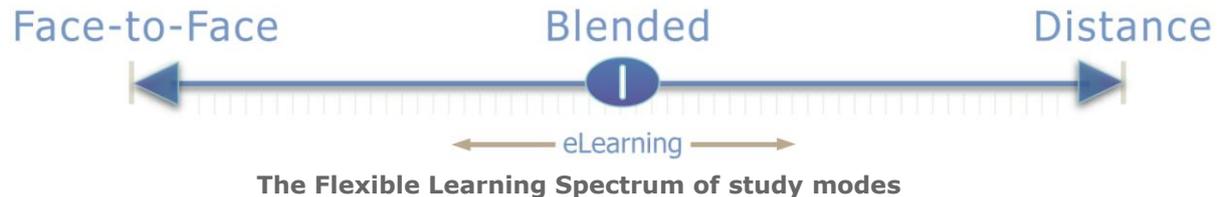
Course design is a highly custom process and depends on the target student audience, chosen pedagogy and instructional design. Whether the intention is to build a bricolage for tutors in Moodle or Blackboard, or to engineer an entirely consistent programme of standalone online distance learning, designing in flexibility of use is essential.

Where is the best place to start when setting out to design new materials for ODL?

Consider these questions first:

1. Are the materials going to be used collaboratively in class, individually over the Internet, or both?
2. Are the ODL materials to form some sort of “[bricolage](#)” that can be orchestrated into a unique learning experience each time, or should they be complete, containing everything an individual needs to study and learn from themselves?

The answers to these questions will greatly influence your chosen ODL design. The diagram below illustrates that there is actually a spectrum of learning and delivery options, and that while online, eLearning technologies can be applied to them all, the careful placement of your course design on this spectrum is crucial to successful use.



Your chosen ODL course design will fit somewhere along this spectrum, and will be influenced by the age and self-motivated studying abilities of your students, and by your desire to support more delivery online.

For example, if you are designing ODL materials for use exclusively in a classroom with a tutor (left-hand side of the spectrum diagram above), you can ensure they have features to aid tutors more than students – revealing information step by step for example. Many team based eLearning simulations use this approach – running the economy of a country and stepping through various time events for example, or being in control of a fleet of ships trading all over the world, and putting students into class-based teams to compete in doing this.

As soon as you start moving away from tutor conducted learning and towards more self-driven online/distance learning (moving from left to right across the spectrum), the ODL design and course materials need to be enhanced to support self-study and revision.

Blended ODL designs, seek to gain the benefits of both class-based learning and the proven effectiveness of relevant distance learning structures. This is seen by many educators as the best approach for both first-degree and post-graduate course. The ODL materials however must still be designed to support self-study and revision.

The more to the right on the spectrum we design for, the more effort must be put into designing and authoring course materials that can provide the missing face-to-face component. Full distance ODL delivers a complete education programme regardless of student location, and the materials have to be high quality (fit-for-purpose) with the tutor completely written in. Some distance ODL designs can assume periodic or scheduled tutor input, but maximum gains in flexibility, scalability and cost savings come from treating all students as distance learning ones, and having materials that are fit wholly for that purpose. This also provides students with more freedom about where and when they choose to study.

One thing stands out. If materials are developed for a distance model then they can be used to support delivery and learning at any point on the spectrum. This is not the case if materials are developed solely to support face-to-face delivery.

Real-World Example: [Edinburgh Business School eMBA](#)

Have you heard of the eMBA programme from Edinburgh Business School (EBS)? It's the largest non-tutored online MBA programme in the World, with 8000 students studying on it this year from 150+ countries. It was a distance learning correspondence programme back in the 1990's but was successfully re-designed to make the transition to becoming an ODL programme.

Although students only have to sit and pass 9 subjects to get their MBA qualification, EBS has created a wide and varied content domain of 47 courses and 900+ individual course components all formatted as single-source masters in open standards XML, and all using the same core learning design template and online delivery approach. Fit-for-purpose content and careful delivery environment designs results in fewer than 3% of its students contacting the Business School with any course query. This in turn greatly reduces the tutor support and administration costs, and allows the programme to scale easily and quickly to accommodate thousands of students around the World studying simultaneously at their own convenience and pace.

Students in this successful ODL design are assumed to be mature and confident adult learners – a specific market niche. They are given maximum flexibility over when to start studying, and can sit examinations within their own countries four times a year. It is a very successful example of a well-targeted online learning design.

Design holistically

The components that form the design for the course will usually come from three main sources:

1. **the learning environment** which provides a structure for the courses, plus functional features such as forums, assessments, etc.
2. **people** (your team of tutors and supporters).
3. **the content** i.e. the specific content components the authors will be asked to create.

Content components	VLE/LMS components	People components
<p><u>For management</u> Competency Framework or Syllabus; Learning Outcomes; Learning Objectives.</p> <p><u>For design</u> Programme Specification; Design and Style Guide; Course Specification; Authors Guidelines; Teaching Guidelines; Student Handbook; Course Guide; Study Plan.</p> <p><u>For knowledge delivery</u> Course Text/Topics; Workbook; Discussion Papers, Cases, Articles; Tutorials; Key Concept Gateways; Q&A Bank; Glossary; Reference List; Resource Bank.</p> <p><u>For assessment</u> Inline Quiz; Unit Quiz; eQuiz; Self -Assessment; Mock Exams; Past Papers & Answers.</p>	<p>Virtual Campus Environment. Enrolment and administration support. Interactive course tools. Delivery and reveal. File management. Discussion forums, notice boards, messaging. Synchronous chat / conferencing. Wikis, Blogs and Diaries eAssessments, Gradebooks, Certificate of Achievement. Peer to Peer Assessment. Assignment collection. Digital Workbook / Portfolio. Search, Tools and Linking.</p>	<p>A Teacher, Tutor, Trainer. An Assessor, Examiner. Face-to-Face Lessons. Class Tutorials. Field Trips. Practice workshops. Live Online Chat. Tutor-marked assignments. Progress monitoring and feedback. Immediate help. FAQs.</p>

Learner centred design

People learn in different ways depending on their individual preferences, available time, chosen subject and motivation. There are different ways to learn too, and learning can be Individual, Cooperative or Collaborative.

Individual learning provides much individual flexibility, but little learning community.

Cooperative learning provides much individual flexibility and access to a learning community.

Collaborative learning required participation in a learning community, but limits individual flexibility.

Morten Flate Paulsen, NKI.

To accommodate these different learner styles, flexibility and choice is needed in how they can access the content, human and technology resources your courses offer. If we look at a typical “MACE” based learning process representation, then we gain an appreciation of where human resources contribute more, and where content and technology resources might contribute more.

Motivation	the step of inspiring students to study a particular subject is something people do well, particularly when backed-up by samples of good quality course materials.
Acquisition	choosing to absorb knowledge from a particular source is a very personal preference. Offering students multiple study modes to acquire knowledge from is very attractive. Good quality course content that has been written in support of self-study enables this choice. It also makes scaling delivery to larger numbers of students more affordable.
Contextualisation	applying and customising knowledge to particular situations that are relevant to students is something people do well.
Evaluation	Assessing whether knowledge is properly understood is something online assessment technologies and self-assessment contents greatly support.

Source: erisa paper “[Reforming Education](#)”

You can use this simple classification to consider where in your course design you want people to contribute, and which tasks are better suited to content or computers to do. CourseworkerXML component flexibility accommodates any course design you may choose, and excels at producing the high quality content components you need.

Design around learning objectives

Learning Objectives (LOs) sit at the heart of the overall design of an effective ODL course and all content developed to support the course should relate to one or more LO. 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.

LOs are also an extremely effective mechanism for providing useful and meaningful feedback to students on their progress, and 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.

Weighted attributes like these should be an essential feature of the course design, 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 educators 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.

Students, tutors and course builders can all get value out of the simple use of Learning Objectives. 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 progress profile can be built up.

Design for standards

Most ODL today is delivered using a computer network. The biggest one is the Internet and it has now reached more than 27% of the World’s population, 1.8 billion people.

Networks benefit greatly from standardisation as it helps to promote universal recognition and easier sharing of content. Two examples of successful standards are **HTML** – the page format interpreted by the Web browser applications (Internet Explorer, Firefox, Safari, Opera) that present the information we read on the internet, and **XML** – the format for ‘smart’ content. This ‘smart’ content certainly includes learning materials which contain useful additional information such as whether it is a case study, assessment question or learning objective. Authoring formats like MS Word

and document distribution formats such as PDF, while in common use, are not very open or 'smart', and are difficult to integrate well into good quality ODL environments.

There are some specific standards bodies of importance in education too. The EDUCAUSE [Instructional Management Systems Project](#) (IMS) maintains many useful specifications and standards to do with how we can format questions, answers and exchange data between online learning systems. The [IEEE Learning Technology Standards Committee](#) (IEEE LTSC) certifies and accredits contributions from other organisations wishing to publish technical standards – particularly for industrial and corporate training use.

So what standards should we be interested in when designing for ODL?

Unless you are a technical specialist dealing with the set up of systems and computers, then it is usually best to keep things as simple as possible while ensuring the capture of good meaning in your course materials. The most flexible standard for doing that is XML or “eXtensible Markup Language” but this is not a language you would normally choose to author in. So, it's usually best to work with a team of people who can take what you write in MS Word or whatever your preferred authoring tool is, and capture, manage and update it for you in XML. That way you can together create high quality and consistent sets of learning materials, that will work well in any online learning environments, and in print too if you need it.

Other standards are useful for packaging up sets of ODL materials and common ones are the [IMS Common Cartridge Alliance](#) and [SCORM](#) packaging standards that are being adopted by more and more learning environment system vendors. However be aware that these are packaging standards – they are not content standards. The content of a SCORM package can be simple Word or PDF files, for example. This different possible use of standards – as a packaging standard or as a content model standard – is an important distinction. Using XML as a content model standard will result in richer learning materials.

Once you have created your ODL materials, your production and learning environment teams can use these open standards to load them into a range of different learning environments helping you to become independent of any one delivery option or system. By adopting open standards and formats you will also be able to create your own resource – oriented information architecture for teaching and learning, and have many useful course materials and assets that enable easier reuse and sharing.

Real-World Example: OpenLearn

OpenLearn is a free learning environment started by the UK's Open University in 2006. Used by more than 8 million students, it has over 8000 study hours of learning materials from Open University courses. The website continues to grow with new course materials being published regularly. Content is mastered in XML format and distributed freely using the associated LabSpace service for other educational institutions to reuse and develop.

ODL materials developed using open standards can benefit from “**single-sourcing**” where they are “written once; reused many times”. This saves much time, effort and unnecessary expense. Simply put, course materials are created in a single or ‘master’ version which is cherished from then on. Updates are made to that master either directly by the production team or indirectly by having authors revise the course materials in whatever editing format they choose to use.

Why is single-sourcing of value to producing your ODL Courses?

The obvious benefit is you only change one file once, for all of your print, online and electronic deliverables. This prevents duplication of effort and improved accuracy. The second benefit is that the production team can use batch production tools, that can typeset a textbook automatically in minutes or generate thousands of web pages in seconds. This takes the ‘sweat’ out of publishing and lets the production team update all versions of your ODL course easily and frequently.

Single source masters evolve. They become more and more capable of supporting useful interactions on a variety of new and existing delivery devices including eBooks, DVDs, Websites, learning environments and gesture based tablet devices. This gives teachers and students much greater choice about how and where to use the ODL materials which in turn often supports greater uptake and if for commercial use, sales and income.

These learning materials also become real assets for education providers, and collectively they can be managed as a “Domain” of content that can be fully exploited for its value. Management of a domain of content lets you introduce organisational–level management tools such as Content Management Systems, which can manage intellectual property rights, revisions and release numbering – all helpful in quality assurance processes.

This ‘content management’ focused approach moves away from traditional course development methods though not by as much as might seem evident. The core processes of learning design and authoring arguably remain much closer to the traditional ones understood by all educators, not just those in ODL.

Real-World Example: Connexions

Connexions is a non-profit start-up launched at Rice University in 1999 that aims to reinvent how we write, edit, publish, and use textbooks and other learning materials. It is a global repository of educational content and it supports collaborative development and free availability of material. Instructors and authors can modify this material for any purpose. It operates an open, standards-based approach based on single-sourcing with XML, for sharing and advancing knowledge to benefit the global educational community. It currently has 16,680 reusable learning modules held as 1010 collections in a content management system for you to use, and

represents a great place to start sourcing content for many higher education ODL courses.

Design for retention

Improving student retention is an important issue for any and all open and distance education providers. The OECD average dropout rate for higher education students is 30%. The Open University UK (OU), Britain's largest teaching institution, with 125,000 undergraduate students enrolled in the year 2000, typically has 25 per cent of new students and 22 per cent of experienced students choosing to dropout during the duration of a course.

Low retention rates can be used as a public measure of poor performance, and can be potentially damaging to academic reputations. The associated loss of revenues can be significant too. One UK distance learning college with more than 4000 students recently measured its drop-out rate at 15%. Halving this rate would increase their annual income by £750,000.

On a personal level, tutors and students can take it as a blow to their self-esteem, and novice students are particularly vulnerable to this issue.

So, why do students drop out?

Student reasons for dropping out however are multi-dimensional and varied.

Tutorial quality is a significant issue. In the year 2000, the OU found that 18 per cent of students described themselves as "very dissatisfied" with their tutorials, the third most cited reason for student dissatisfaction. Six per cent stated they dropped out because they were not happy with their tutor. Good quality self-study ODL course materials can help address this specific issue.

Inappropriate course choice is another reason, but the main reason stated by students themselves is that they fall behind in the coursework. Surveys of students who do complete OU courses, have found that 23% say the amount of time spent studying was a lot more than expected, and the majority (57%) fell behind the study calendar. Time management is implicitly bound up with learning success (Thorpe, Mary. 2007) and there is a need to ensure that the student's perceptions of expected and actual workload match as closely as possible.

There are three main sources of work for students:

1. work derived from the course materials;
2. work students wish to set for themselves (revision etc.); and
3. work involved in learning to study, write academically, research and use virtual learning environments.

The number of study hours required by the course materials, and the work involved in reaching the identified learning outcomes, is core to the workload for any ODL course. A significant mismatch between the stated hours and the actual hours required by the materials will lead to significant stress for students struggling to keep to an unrealistic study plan.

Inherent difficulties or complexities in the subject matter itself; poor clarity, usability or navigability of the materials; excessive number and use of activities like spreadsheet use or internet searches, can also contribute to students falling behind.

So, what can be done at the design stage to reduce the rate. Lets look at two significant areas for potential improvement – the materials, and the online learning environment.

Improving the course materials

Accurate and complete *course descriptions*, representative taster materials, good alignment with industry relevant qualifications, and convenient delivery in a variety of media formats such as electronic, paper, and face-to-face, all help the initial selection process. Make sure these components are a part of your overall course design. A *student induction course* can also serve to welcome and orientate both new students, and those who return after taking a break from their studies.

Diagnostic materials have long been used in open and distance learning to better advise students about their study choices. There are essentially two kinds - generic, to test applicants' suitability for higher education, and course-specific, to test suitability for a particular course. Both can be either externally or self-assessed.

A *structural analysis* of existing course materials will identify inconsistencies in reading times required. Analysis of student and tutor feedback will help to identify specific areas for improvement. The goal is to ensure the materials contribute to a balanced workload that is flexible enough to fit in with each student's study plan.

One improvement option for ODL course materials that particularly assists those studying alone at a distance, is to design *more and more useful assessments* which reward student effort with richer answers and feedback. Student achievement should be rewarded in a consistent manner that is meaningful to the student. Online feedback mechanisms tracking a student's progress against the learning objectives for a course, are popular with students. *Hyper-linking* from a specific right or wrong answer back into an exact context in the core learning text increases the richness and relevance of the feedback given.

From an interactive content design perspective, *Interactive learning objects* dealing with particularly difficult concepts in an alternative way are also popular, and are often the most cost-effective use of eLearning technologies.

Course materials should be designed and produced to a consistent *minimum standard of feature support* across the whole programme, allowing students to become familiar and comfortable with this standard set of capabilities provided by the materials.

Many of these improvements are best enabled by using a *single source publishing* approach for producing and updating them. Such an approach allows easier analysis and updating of the learning materials for all forms of delivery, leaving more time to be spent on incrementally improving them. It also improves quality by underpinning richer linking, better link management and more semantic searching and use.

Improving the online learning environment

Many education providers require all students and programmes to use one online learning environment in one way. This may simplify administration and tutoring, but is made at the expense of flexibility for the course designers and learners.

Flexibility is key in delivering successful online teaching and learning experiences to as many people as possible. When unplanned life events force students or tutors to change their mode or pace of work, flexibility in provision helps to accommodate such change and to retain them.

The ideal virtual learning environment has the flexibility to build student-centred learning environments that can be custom for each programme, study mode and each individual. This might mean providing extra help for younger or more inexperienced learners, including tools to aid self discipline in studying. It may also mean combating the isolation of distance learning with support for carefully prepared and timeous emails, efficient and well edited collaboration forums, and regular and easy-to-use feedback mechanisms.

Knowing in detail how the course components provided by the learning environment are used by individual students, tutors, and collaborating groups, gives useful insight into the process of delivering a successful online learning experience. Gathering such feedback is a key function of the environment, and underpins the continuous process of quality improvement. It also helps educators to set specific retention benchmarks, based on relevant performance indicators such as feedback and attainment, specific to different academic units.

The latest generation of learning environment technologies are more flexible, more service-oriented, and less ‘system’ oriented. They can be integrated with any open web portal or learning environment, and allow the implementation of much more efficient virtual learning designs and experiences.

Design for interactivity - but only where needed

Interactivity is only one way to learn. It is not always essential that online learning materials have to include it. Some text based subjects are written to be read primarily, as the Wikipedia website shows for example. Some interactions are best achieved through reflection, annotating, and peer discussions held off-line.

Where interactivity is helpful is when we are trying to communicate difficult concepts, rules and principles into action. Therefore, focus on authoring interactions for those needs, rather than implementing button clicks slavishly for the sake of animation.

Course Design Templates

Course design templates are a very pragmatic way to aid ODL designers and authors. They help to remove a lot of the ‘unknowns’ of course design, and ensure that for each course all the necessary components needed for successful delivery are present, well integrated, and clear to all stakeholders.

Lets us now look at five real-world examples of templates being used successfully today for schools, higher education and continuing professional development (CPD).

Example school design templates

The first design template example for schools is one that is in use today by the UK’s *ifs School of Finance*. *ifs* operate an ODL service for 300+ UK schools that delivers a series of “introduction to money” ODL courses for pupils aged between 14-16 years old covering topics such as personal banking, currency exchange, credit cards and borrowing. Individual PDF topic sheets are downloaded and handed out in class and gone through face-to-face with a teacher.

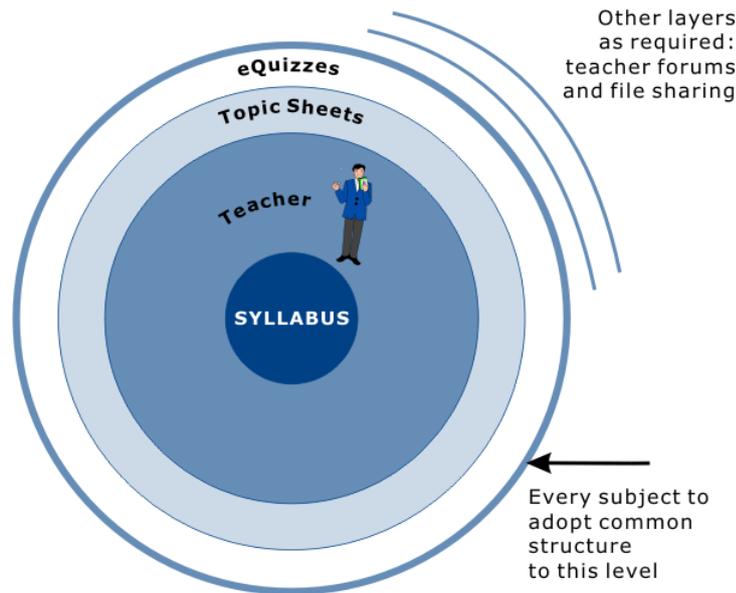
The screenshot shows the website for ifs School of Finance, specifically the Money Management (MOM) course page. The page features a navigation menu on the left with links to Home, Unit students, Staff room, ifs Links, Forums profile, and Return to my studies. The main content area is titled 'Money Management (MOM)' and lists seven topics, each with a link to a 'Topic sheet in PDF format':

- Topic 1 Know the different sources of income
- Topic 2 Understand the different savings providers and the features of saving products
- Topic 3 Basic borrowing products and providers
- Topic 4 Exchanging items for money
- Topic 5 Different types of spending
- Topic 6 Basic tools used to manage a personal financial budget and to make calculations
- Topic 7 Protection through insurance

At the bottom of the page, it states 'e-quizzes available from September'. A vertical banner on the right side of the page reads 'my ifsLE'.

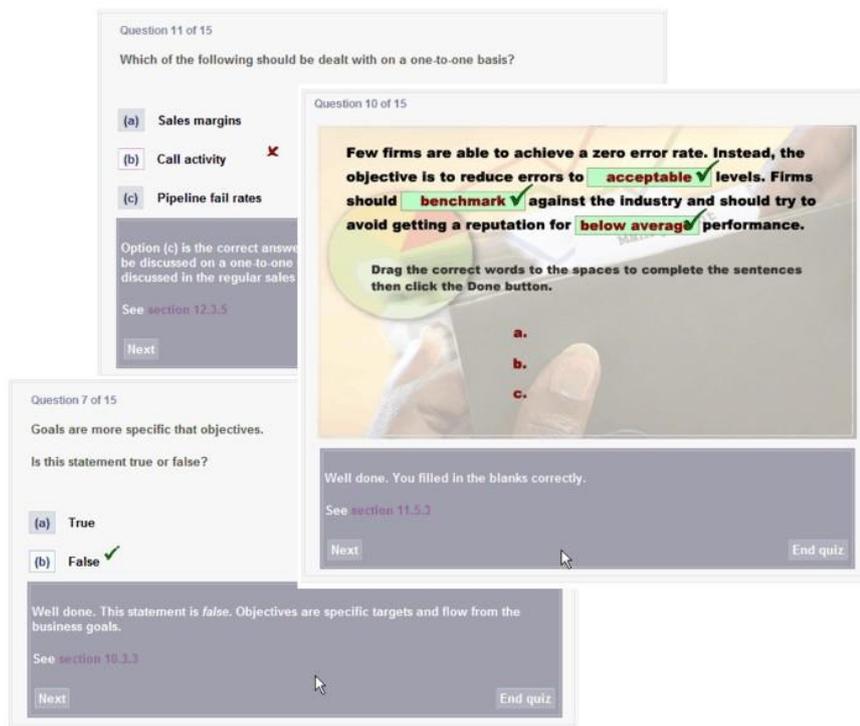
Simple ODL environment with the PDF topic sheets for teachers

Pupils are then required to log online and undertake an interactive end-of-topic “eQuizz” comprising 10-15 interactive assessment questions and illustrations. The individual pupil marks are summarised for teachers in a summary page. The design template for this tutor-centred ODL course is illustrated as:



A course design template for a tutor delivered ODL supported course

The Pupils like the one to one interaction they have with the eQuizzes, which are highly graphical and include drag and drop features and real-life pictures. The eQuizzes also provide feedback that helps them to re-visit the questions they got wrong and links back into the study topics.



ODL eQuizzes with drag and drop graphics and section links

The teachers appreciate the automatic summary sheet showing which pupils are having difficulties, and also have a private “teacher only” message board to exchange

experiences, ideas and useful files between schools. The course design template is therefore appreciated by developers, teachers, pupils and administrators alike.

As a second ODL design template aimed at schools is one used to deliver a series of online workshops for the British Council's [Global Schools Partnerships](#) programme.

This series of workshops for teachers is aimed at fostering links between schools around the world in different countries. Teachers are encouraged to register online in a custom learning environment linked to from the main British Council website. They then work their way through a series of highly graphical and interactive topics which contain different paths according to their selected preferences.

First thoughts

Opportunities and pitfalls

OPPORTUNITIES PITFALLS!

'School linking can be an exciting and valuable educational experience for pupils and teachers, and can add a lot to the development of a [global education] approach in schools. But it is also a demanding, complicated and time-consuming process which doesn't automatically lead to good [global] education. A bad school link, undertaken without enough thought or preparation, can be a very negative experience for both link partners.'

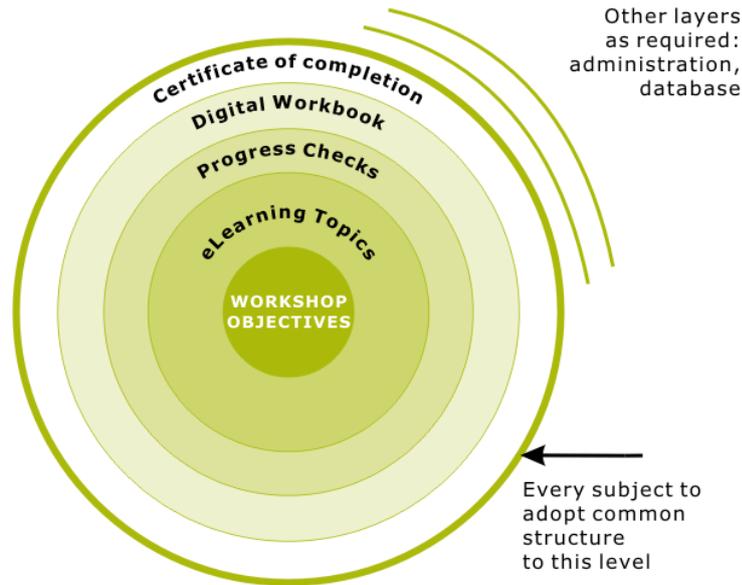
'© Oxfam: Teacher Support, School partnerships'
Oxfam, *Building Successful School Partnerships*, 2007

Home
The course
1 First thoughts
What do I already know?
Successful partnerships
Opportunities and pitfalls
Reflection
2 Motives
3 Perceptions
4 A global curriculum
5 Preparing for partnership
my digital workbook

ODL workshop to replace previously delivered face-to-face ones

The ODL designer and course author have embedded “reflection boxes” within the materials at various points, so that the Teacher’s comments are stored and recorded in-situ. They are also added to a “Digital Workbook” which can be visited separately by both the student and a British Council support person who can approve the work for final acceptance and certification.

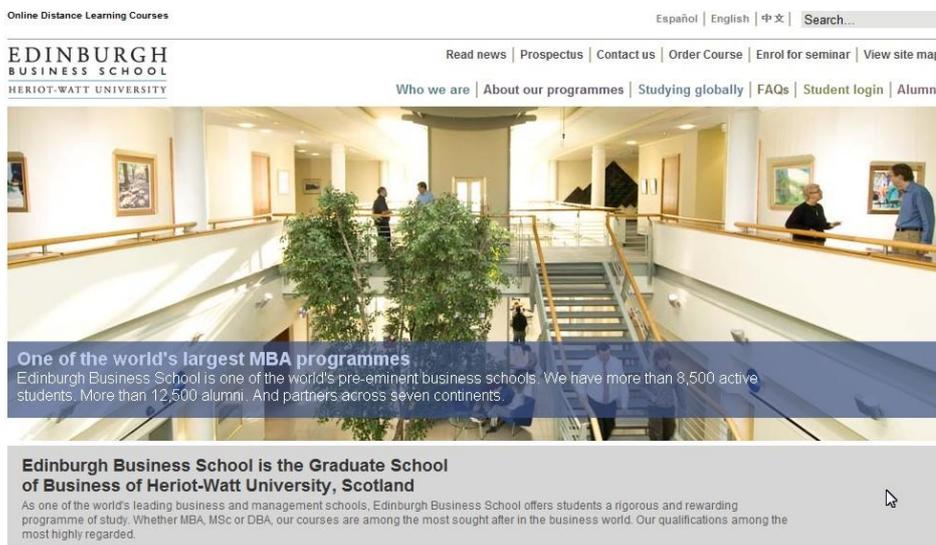
Key progress details are summarised for British Council administration staff who monitor achievement and progress. The course design template for this ODL course is:



Design template for the Global Schools Programme online workshop

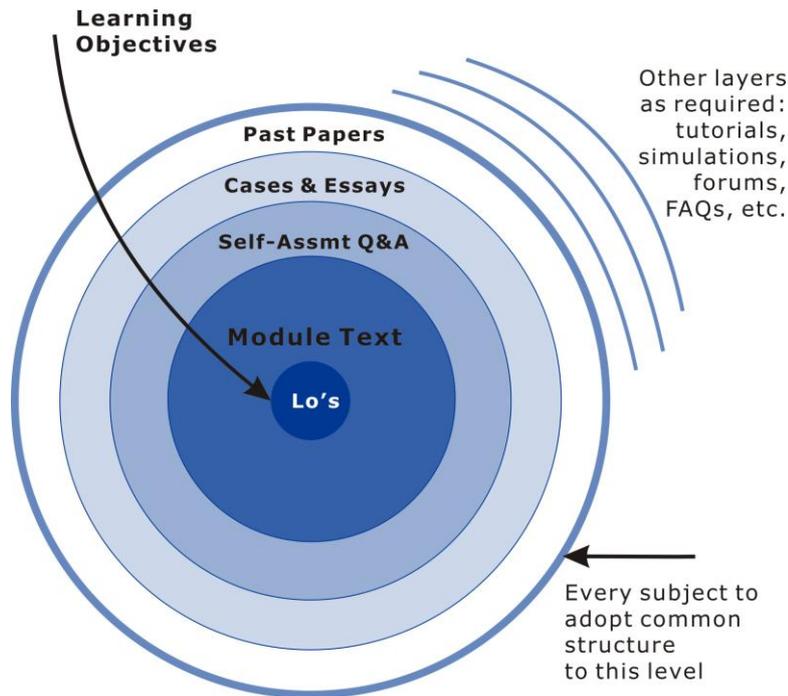
Example higher education design templates

The first higher education design example we will examine is the template successfully used by Edinburgh Business School (EBS) for their online eMBA programme.



Edinburgh Business School home page at www.ebsglobal.net

The EBS course design template has a number of course **components** including a core module text, self-assessment-questions with comprehensive answers, case studies and essay articles and past papers. These are carefully chosen to suit the target student audience – adult distance and online learners who have had previous successful higher education study experiences.

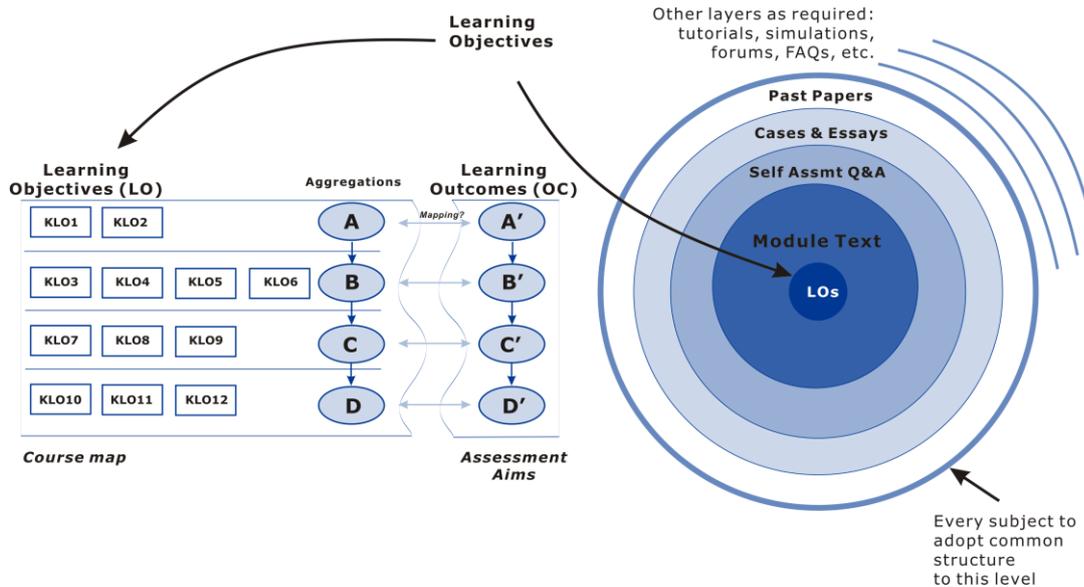


The EBS course design template with comprehensive module text

Particular emphasis is given to a good quality core module text with instructional guidance written in, and lots of content rich self-assessment-questions with answers. These are very popular with students as they enable lots of examination practice. While the core text still delivers the bulk of teaching and many students still choose to read it off-line, there is particular ODL value put on the self-assessment questions which are taken interactively online. These are aligned to the individual learning objectives; link back into specific places in the module text; and provide rich, formative personal feedback for each student.

EBS require that all courses in their programme must have all of these core components which means that all the course authors know they must provide them, the editors and production team can assume they will be there, and the online delivery environment can be setup to deliver them all in a consistent way. While this 'standardisation' around the course template makes life easier for the designers and developers, it also makes thing much more consistent for the students using the courses which helps to improve familiarity and confidence in using them.

Underpinning the EBS ODL course design template is the use of learning objectives. Courses are authored with between 5 and 12 **Learning Objectives (LOs)** that map directly to the **Learning Outcomes** the students are assessed against. The next illustration shows this and now these links can be made explicit for students in a **course map**.



Relationship between EBS’s learning objectives, outcomes and course components

Every course component is also structured with the LOs which means that students always know what learning objectives the current course materials relate to. As they work through the self-assessment materials in particular, a personal profile graph as shown below, can be displayed to them showing which LOs they are making good or poor progress with, and enabling them to focus their revision into areas of weakness.

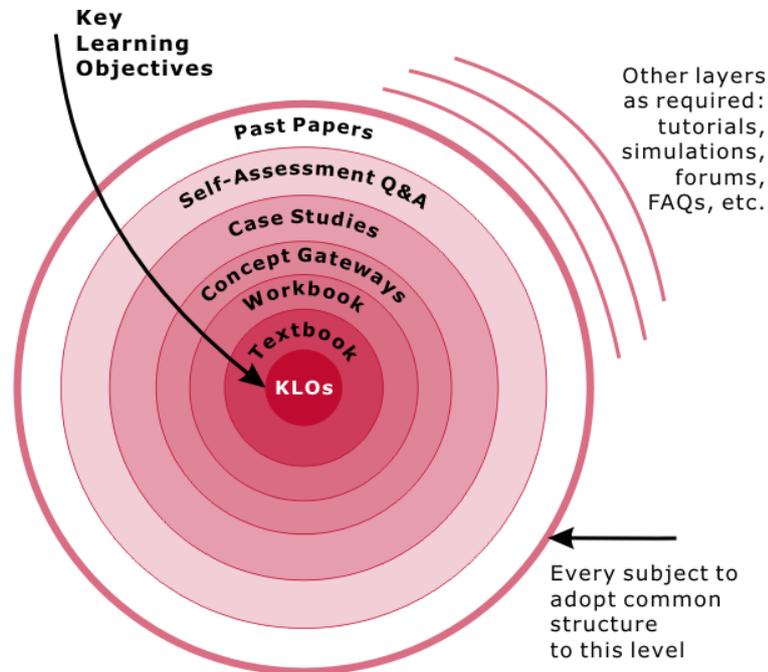
Learning Objective	Progress Bar	Score
Agency (Agency)		51.1 / 69.1 / 190.2
Analysis & Choice (Analysis)		138 / 213.6 / 347.7
Capital Structure (Capital)		75.7 / 129.5 / 187.3
Project Cash Flows (Cash)		80.6 / 139.3 / 350.5
Evaluation of NPV & Choice (Choice)		80.3 / 128.6 / 234.9
Financial Decision Making Framework (DecMaking)		16.6 / 32.3 / 98.2
Dividends (Dividends)		12.2 / 23.8 / 147.3
Financing Decision (Finance)		15.1 / 23.7 / 24.5
International Finance (International)		20.7 / 36.1 / 174.5
Investment Decision (Invest)		10.8 / 16.5 / 16.5
Which Method to Use (Method)		112.1 / 163.3 / 308.4
Options (Options)		81.6 / 124.6 / 190.2
Risk & Cost of Capital (Risk)		170.3 / 279.9 / 630.9
Tools of Finance (Tools)		146.9 / 242.3 / 497.7
Valuation (Value)		48.9 / 91.2 / 350.4

A graph showing a student’s individual progress against the Learning Objectives

In this graph, the green bar means an assessment pass for questions related to that specific learning objective; black is the total questions attempted so far by the student; and white the total questions available for each learning objective in all the assessments for the course.

The second higher education design template we will look at is one in use today by Napier University in the UK. In this more traditional course design template, greater emphasis is given to using a separate study guide or “workbook” that compliments a

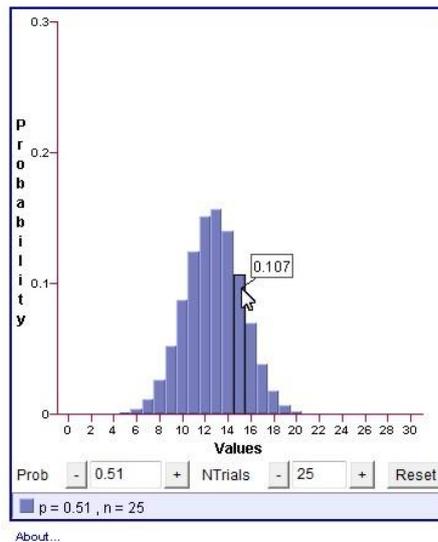
standard Publisher’s “textbook” and structures how the student should undertake the course and progress through the core textbook. This design is still towards the right-hand side of the flexible learning spectrum diagram however. There is no face-to-face contact time in class for example and the course offers a much richer set of self-assessments and past examination papers.



Example template using a core Publisher’s textbook and separate study guide

The other notable new ODL component specific to this design is the “Concept Gateway”. These are individual ODL objects or online tutorials that provide alternative ways to study and comprehend difficult topics for a subject – perhaps a statistical method or a key concept that is difficult to grasp at first. Concept gateways can be text, graphic, video, animation or simulation based, and they make the best use of the ODL medium to address key subject concepts.

The following illustration shows an example of one that animates the statistical Binomial distribution for students, allowing them to explore how it can be modified by changes in its variables n and p . It can be [embedded in a web page](#).



Remote Control

Both p and n can be modified.

Examples

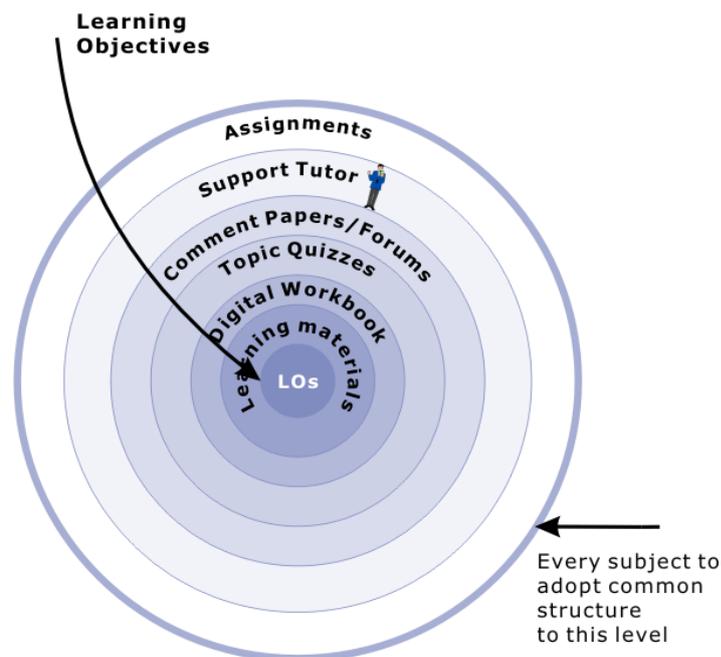
[Set p = 0.5 and n = 10](#)

[Set p = 0.1 and n = 20](#)

Example Concept Gateway: software object used to study how binomial variations in statistics change when their inputs vary

Example CPD design template

The example continuing professional development template we will look at next is being used by [Coachesinfo Limited](#) to deliver continuing professional development in science to professional sports coaches. Coachesinfo is a general resources website for sports coaches and contains hundreds of papers and articles dealing with sport science topics. Each ODL module is based on a core CPD syllabus part of which is addressed by specific ODL “Topics”. The components of this ODL course design can be illustrated as:



The Coachesinfo CPD course design template

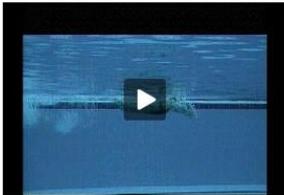
The core learning materials are divided into individual topics. Each topic makes use of interactive media elements including especially video clips of sports men and women in practice.

Section 2.2 : Developing Economy in Swimming

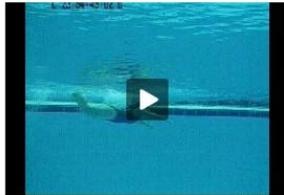
2.2.6 Using Large Muscles

Because small muscles fatigue readily compared to large muscles it is preferable to use large muscles to generate propulsive force. This principle is exemplified by the body undulations of skilled butterfly swimmers. Novice butterfly swimmers tend to rely mainly on the arms for propulsion and fatigue quickly as a result.

Video 24: Skilled (A) and Novice (B) butterfly swimmer



A skilled butterfly swimmer. Note that the skilled swimmer is making effective use of the whole body including a body wave that adds vigour to the kick.



A novice butterfly swimmer. The novice swimmer is relying on the arms and a kick from the knee to produce propulsion. Thus, the novice swimmer quickly becomes exhausted.

Short single video clips embedded in-line to illustrate a point

Topics are supplemented by comment papers – the latest articles on that subject. These terminate with an inline commenting function that lets coaches record their opinions immediately after reading the paper and share them with others on the course. Other inline interactive objects include Reflections that are saved to a Portfolio database, allowing students to revise them later on, and tutors to see a body of evidence showing that the students have worked through the materials.

Reflective Activity

How many of the principles of economy can you remember? Make a list and check it against the answer.

There are quite a few...

Show DWB 

Inline activity soliciting students personal reflections

Topic: 1	Topic: 2	Topic: 3	Topic: 4	Topic: 5	Topic: 6
Topic: Applying the General Principles to the 'Rolling Strokes' – Front Crawl and Backstroke					
Session: The Front Crawl Technique					
Activity: What about the Hips and Legs?					
Question: <i>Can you think of practice drills that could be useful for developing a kick that will be suited to the full rolling stroke?</i>					
My answer: Streamline kick drills to establish a long loose action from hips through to toes followed by side kicking drills, starting with one side only, alternating sides by laps then rotating drills - side roll hips shoulders to opposite side, focus on smooth rotation drills. Any number of kick cycles, arm slide roll drills wher the swimmer kicks on the side and the hand slides forward underwater before pulling the swimmer to the other side. There are also a number of arm drills aimed at smoothe body rotation and kick rotation. Edit					

Reflection answers summarised in the student's digital workbook

The deliberate use of personal Reflections, comment papers and general learning environment Forums is an attempt to persuade students – assumed to be minimalist – to interact with the course materials in a personal way, to comment in a restricted way, and to eventually move over to a more social environment respectively. Many students do not choose to be social, so the Coachesinfo course design is an attempt to increase levels of student interaction.

Links to papers within the main Coachesinfo community-of-practice website are also kept current, so students can benefit from the latest research and debate. This is appreciated by students:

“Most of the way through the Biomechanics of swimming, down to the major assignment and two smaller ones. Enjoyed it, good info, love the links to articles, very relevant to tutors and coaches. Full funding for the whole programme came through today so you will have to put up with me a bit longer :)”

Actual student comment

The chosen delivery environment is Moodle, and embedded links to end-of-topic assessments (interactive quizzes) and discussion forums are also present in the ODL materials.

1

Marks: 1/4

Fill in the missing words of the following.

The speed that can be sustained by a swimmer over many strokes **completely** depends on the interplay of the **jerk** impulse that they can produce and the resistive **forces** acting against them. When swimmers are swimming at a speed that is constant from one stroke cycle to the next, the propulsive impulse for one cycle is **equal** to the impulse from resistive forces.

Partially correct

Marks for this submission: 1/4. This submission attracted a penalty of 0.4.

2

Marks: 0.6/4

Match the statements on the left with the options on the right using the answer box:

Move easily through the water because they are 'streamlined'.	Form drag
Refers to parallel streams of fluid.	Laminar flow
Occurs when flow 'separates' from the body.	Turbulence
A dominant contributor to resistive forces in human swimming.	Aquatic animals

Partially correct

Marks for this submission: 1/4. With previous penalties this gives 0.6/4. This submission attracted a penalty of 0.4.

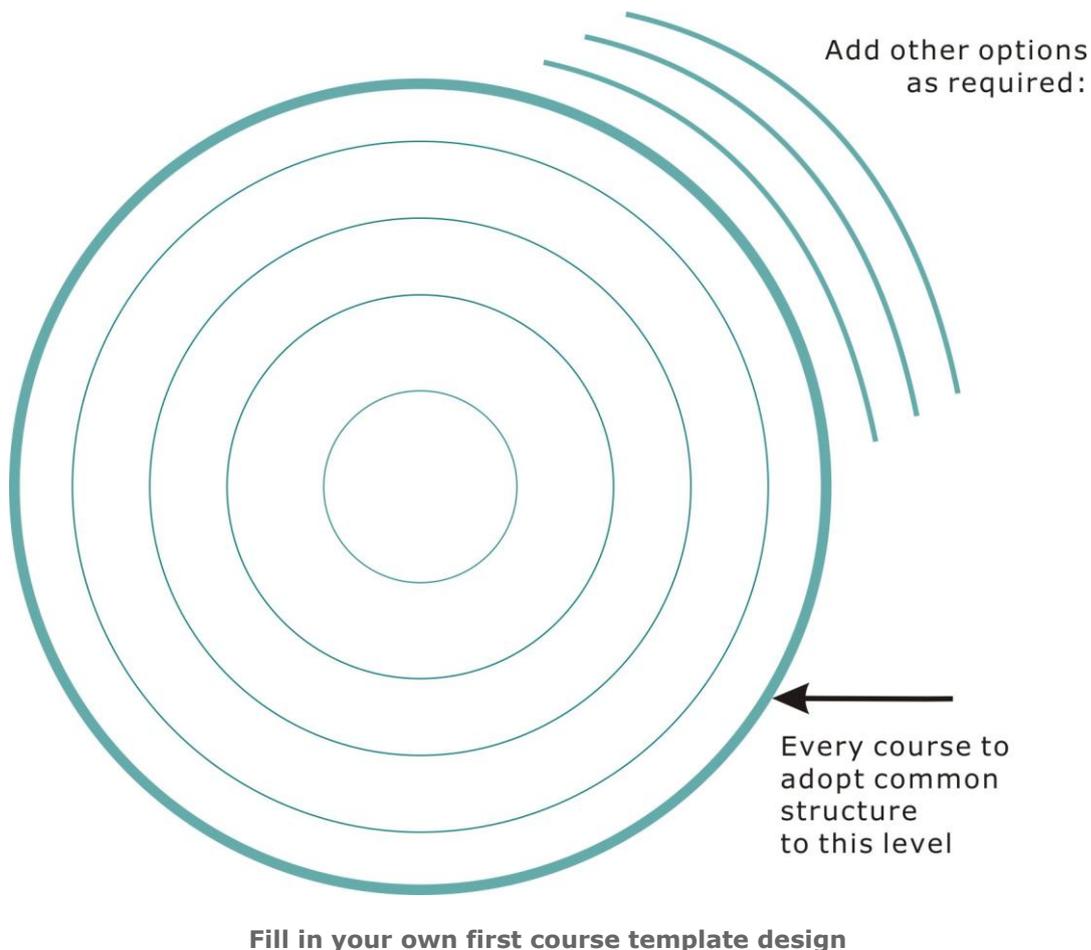
End-of-topic quiz for formative self-assessment

End of study assignments are also Moodle based, and student coaches can upload their assignment papers and videos directly into the ODL environment for marking by third-party tutors who are paid for marking each individual paper.

Coaches are allocated to individual study tutors but there is not much interaction between them, except for the final assignment or if a problem arises during study. Most of the online interaction is with other coaches through the comment papers and online discussion forums.

Develop Your Own Design Template

The previous five examples of successful ODL design templates show a range of possibilities and show the value of sketching out the details of your own needs. Use the empty template below to have a go at sketching out your own ODL course design and programme standard.

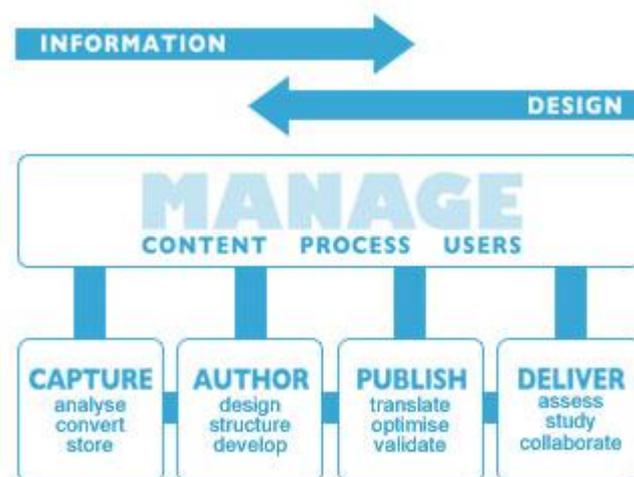


- Start at the middle with the most important component of your course design. Where will it fall on the flexible learning spectrum – supplementing face-to-face delivery in some blended way or self-contained for self-study and progression? In other words will it be a person, a set of purpose written study materials, or both?
- Are there a manageable number of clear learning objectives that students can relate to, and which also relate to the assessment outcomes? How important are these to the course – does every other course component need to relate to them?

- Add the next layers for the next most important components to your course. Keep going until you have listed all of the components that must be present. Then draw in the hard outer shell of your design ‘onion’, outside of which you can then list the optional components you may choose to have for some courses but which aren’t necessary for all.
- Once you have the rough outline of your selected ODL design, put a bit more detail on each of the course components and the purposes they are expected to fulfil. For example: structure the core course content to support online study sessions of 50 minutes or less so that students have natural break-points to return to. Separate out long articles and texts into separate “readers” which students can choose to read offline if they wish. Add extra summaries at the start and end of online topics. Link to discussion forums that are highly relevant to the study context.
- Develop lots of practice assessments and quizzes and make sure the answers are content rich with useful feedback and comments. Link from your quiz answers back into the core learning materials – helping students to address any areas of weakness more quickly.
- Spend some time thinking about how you can make your learning content more engaging for online learners. As a general guide; vary your textual materials with interesting illustrations, media and features (tasks, exercises, cross-references), but avoid using unnecessary embellishments such as animations for the sake of motion or ‘eye candy’.
- Consider using embedded reflections in the core materials which invite students to comment in a digital workbook. These should never be ignored or thrown away, and digital workbooks can be used for revision later on by the students, added to ePortfolios, or assessed as evidence of study or compliance by tutors or managers.
- Finally, work through your course design with the other stakeholders – authors, developers and learning environment team, and construct a sample to test first before going into full production. Remember to constantly improve them over time by soliciting regular feedback from the students on the effectiveness of the course materials.

Shared Course Production Model

When it comes to ODL course production, it helps greatly if everyone “sings off the same song sheet”. One proven learning materials production model that can be used is the [CAPDM Model](#), CAPDM stands for “Capture, Author, Publish, Deliver and Manage”. It is a generic model of information flow and publishing that focuses on the key processes involved in enterprise content management and delivery, and is particularly useful when developing extensive, or institutional, sets of ODL course materials that have to be packaged up for delivery in different performance-support environments.



The CAPDM Model – a generic model for publishing

Most course development efforts start with some set of useful materials that already exist but need to be “**Captured**” again into some more reusable form. These are often referred to as *legacy materials* and it is important to decide early on whether it is better to author new ones for the new ODL media or not.

In the CAPDM production Model, once all the “**Authoring**” is done and the editors are finished checking the core components, all materials can then be mastered using an **open standard format** like [XML](#), and not a proprietary or inflexible one that can only be used for typesetting for print or web pages. Doing this properly underpins great flexibility for future reuse and cost savings and it is best to work with a production team of specialists to do this for you.

Once all the content capturing and authoring is complete, the next step is “**Publishing**” them – converting what has been gathered into specific delivery formats like PDF documents, HTML web pages, RTF Word files or ePub electronic book files. The more flexibility you want to give tutors and students, the more formats you have to create and maintain. This becomes expensive to generate, quality assure and continuously update. This is where the value of using **single-sourcing** and **batch production tools** becomes obvious, as they can quickly generate and re-generate all the output formats you need.

Once you have published your course materials in the multiple-formats that you need, the next step is to “**Deliver**” them successfully on your programme. This might be face-to-face in a blended learning classroom use, or at a distance in print or online where tutors and students use the materials as individuals in a learning environment of their own choice. It is vitally important that the design of the course materials you produce are fit for the intended teaching and learning purposes. Ensuring optimum delivery actually configures the whole publishing process, as each of the capture, author and publish work stages undertaken up to this point are configured and if necessary re-configured to ensure best delivery.

This key need to be **delivery-driven for best quality** (fitness for purpose), should change your perspective on the whole course materials publishing process. It is particularly important for creating ODL materials and learning environments which can be very expensive to set-up and populate with content.

The final step in the generic CAPDM publishing model is the “**Manage**” one, which simply suggests that it is silly to spend a lot of time and effort creating new course materials in open standards formats, to then abandon or lose them when someone leaves or technologies change. Better to cherish them continuously and evolve them over many years to become highly valuable **assets**. Update them regularly – you can afford to once you single-source. Trace all changes made to them using **revision control**. Track who owns what intellectual property, and ensure all released versions are complete and correct. Reward people who regularly maintain their materials.

The CAPDM model helps with the understanding of the publishing processes used to develop all course materials including ODL ones. It shows where the use of open standards is appropriate, but it requires developers to be design and delivery-driven. It is also a reminder that the on-going management of the ODL materials is equally important for long term reuse and benefit of valuable ODL materials.

The Implications for All Involved

We have looked at how to apply course design templates and open standards to create domains of reusable ODL materials that can be easily kept up to date and shared by others.

It should also be obvious that this approach is not best suited for individuals wanting to hand craft an ODL module in isolation. Why? Because creating useful volumes of consistently designed and developed ODL materials is a *team effort*.

“Surely this is restrictive”? Actually no – the complete opposite in fact. By recognising the team requirement, you can free yourself to concentrate on what you are best at and avoid those things you may struggle to do, usually wasting much time and effort in the process. As part of such a team if you find yourself doing something inefficient, or something you are not confident in doing, get help. Good teams are highly enjoyable to

work with, and it is their motivated productivity that makes the cost of good quality ODL affordable and sustainable.

The remaining sections look at ODL development from the perspective of the different stakeholders involved in this process. In small projects, one person may undertake multiple roles, but it is important to understand the implications of this new way to produce learning materials for each role.

Implications for course designers

Most of this chapter was written from the perspective of the ODL course designer. What it perhaps new is the concept that an ODL course is designed like a layered “onion” -- comprising multiple integrated components around a core of learning objectives with the most important ones nearest to the core. Each design is placed somewhere on a *flexible learning spectrum*, which helps designers to choose the right kind of components for the target ODL audience.

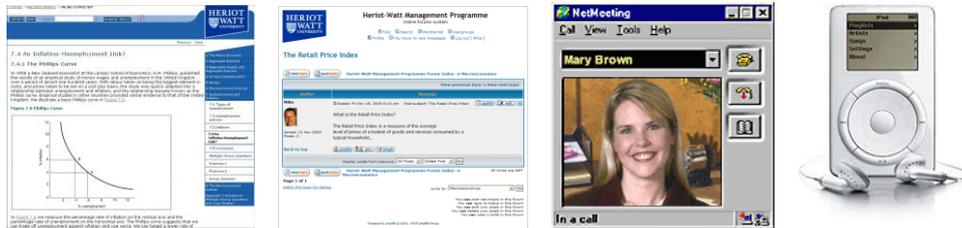
One of the most difficult challenges course designers and developers face which has not been covered so far is *existing course or legacy materials conversion*. There are three main approaches to creating ODL course materials – use something that exists as it is; substantially re-make something that already exists; or create something completely new.

An “**Integrity**” course development approach means you are going to keep any existing legacy materials essentially as they are, when you reuse them for new ODL design. Many companion websites for Publishers textbooks use this approach, and it often requires the least effort to complete. Some purists claim that putting books online is not good ODL design, but they can have a valuable role if their intended use is mostly for browsing, cross-referencing and searching. Students are already familiar with book structures and features, and some, particularly older ones who have already read a lot of textbooks, appreciate their familiarity.

A “**remake**” approach means you are going to significantly change the structure and presentation of the existing materials which will look quite different from their original form. This usually takes more effort, but can produce new ODL courses that provide more engaging learning experiences. This work might involve turning chapters into topics and structuring them into chunks that can be more easily managed in a 50 minute online study session.

A “**new**” approach means starting completely from new and involves writing, drawing, animating new materials using their favourite authoring tools. This can be expensive, but if carefully prepared templates are provided by the course designer, they can be used to guide authors to create high quality course components cost effectively. The new online ODL media gives course designers many new opportunities to create more effective teaching and learning experiences. There is no single “right” way to do it, but following the advice given here, that has been hard won over twenty years of successful online design experience, should help.

Implications for ODL authors



Online textbooks, debating forums, video conferencing and podcasting – examples of new technology alternatives available to the distance educator today

Authoring ODL materials is similar to authoring distance learning materials. What was traditionally delivered face-to-face by the “sage on the stage” now needs to be written in to the materials, either as clear narrative to be read, or in the form of structured guidelines perhaps as a workbook, that guides the students on how to study and be assessed.

Ensuring that the student has all s/he needs to hand in the materials is good distance learning practice. Separate out the essential from suggested readings and references. Establish clear learning outcomes, and use regular learning objectives and summaries to help students to structure their learning, and to gain personal feedback on their study progress.

If you have a lot of text to read, then be sure to provide it in a variety of options that gives students the choice to read off-line in print, on a laptop or on other devices they might prefer. Re-structure it into manageable sessions of 50 minutes or less, and be consistent with how you structure the materials.

The specific exception for ODL however is the need to exploit new ODL technologies effectively. Some useful pointers for this are:

- **Use hyper-linking but thoughtfully.** An advantage of online materials is that students can hyperlink – click and jump quickly between different parts of the course materials. Use this feature to link from one section to another, and in particular from the answer you reveal in an online assessment back into the core learning materials at the point the assessment question was assessing knowledge of. Don't overuse it though. Embedding lots of inline links to website and publications outside of your own course, serves to distract students and interrupt their current paradigm.
- **Use multimedia but as individual elements.** There is nothing like a well paced video or audio clip which is immediately relevant and useful. There is nothing worse than watching long videos that are downloaded slowly online and have questionable value in their entirety.

In the past, video, audio, animation and software enhancements to course materials were expensive and difficult to do and deliver. Today, with camera-phones and video distribution services like Youtube and audio podcasting services, adding media elements to materials is much easier. They are more reusable too in other uses. Today's video element formats such as MPEG are also standards based making them more long-term. Individual media elements can be added more easily to a learning text than attempting to hand-craft the entire learning text as a multimedia "show".

One note of caution however is that quality counts. Students are already used to professionally produced media clips developed by experts for broadcast use. If you have a whole programme to do, use a specialist video and audio production team or license in good quality content.

- **Record Reflections.** Embed reflections inline in your materials that students can use to quickly record their own thoughts. These should be saved in a digital workbook and used for revision and assessment later on. You can also solicit student feedback through embedding links to message forums and appending comments to papers read.
- **Give regular feedback.** ODL environments usually provide quick quiz tools that can give immediate feedback on knowledge acquisition. Well crafted computer-aided assessments can also test comprehension, application and analysis, synthesis and evaluation too without overburdening human tutors with the need to mark them. Make sure the answers given are content rich.

All of the ODL specific features discussed above can be enabled in most modern ODL environments including Moodle and Blackboard. Authoring the ODL materials is still achieved using the same choice of authoring tool - MS Word for example. Templates are a useful way to guide the authoring process. Yes - more direction is needed to include media elements and interactions, but rarely is there a need to 'storyboard' the ODL materials themselves. The authoring concept is still one of multiple and familiar course components centred on the key learning outcomes and objectives.

Implication for course developers

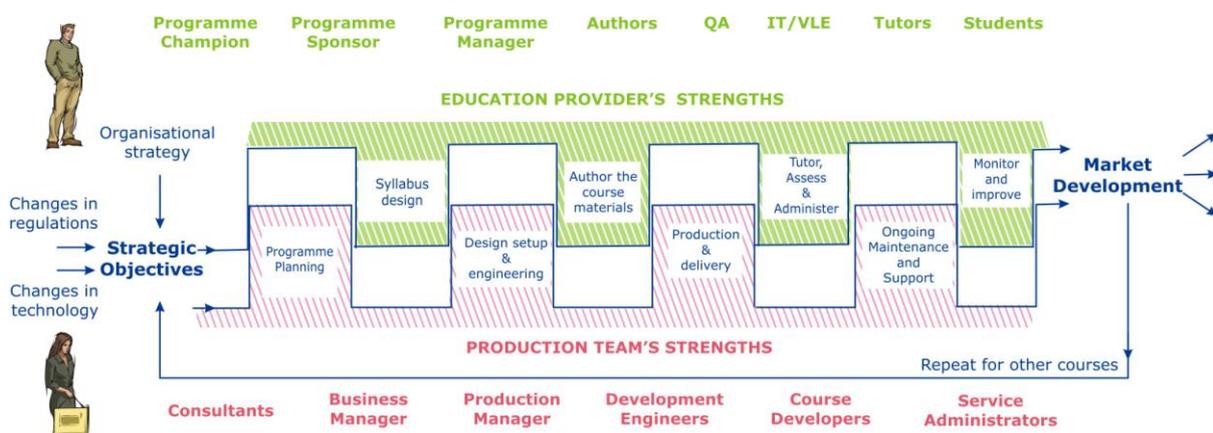
Good ODL course developers following a C-A-P-D-M model of course production will:

- Apply one architecture and open standards to the ODL materials they produce for you, and operate one production solution for all media and uses. They work with open standards to prevent lock-in to proprietary vendors and technologies.
- Create single master sources and cherish them. They will avoid any unnecessary duplication of production effort, and may use a digital repository for storage and revision control.

- Be highly efficient and productive: They will work with batch processing tools and be capable of quickly updating and re-releasing your ODL materials.
- Avoid Unnecessary Complications. Course developers should not be programmers. If you have a template-based and well constructed production process, the amount of custom programming needed should be zero once everything is set-up.
- Offer more significant help to Authors. Course developers are people who will take your ODL materials and develop them further with interactivity and meaning for both tutors and students. They know the limitations and opportunities of your chosen delivery technologies, and are capable of working with you to best exploit them.

Implication for managers

Designing and producing ODL materials can be expensive to setup to do first time, and expensive to maintain if done inappropriately. Production managers will therefore appreciate the benefits of sharing an efficient ODL design and production workflow with designers, authors, developers, tutors and other media production specialists.



Sharing an efficient ODL design and production workflow

One key decision is whether to resource all production in-house with a complete and well equipped team of course developers, or whether to use external resources or both. It is often better to do both – to have an on-house team capable of cherishing and updating course assets efficiently in an ongoing process, and to use proven external production specialists who have done it before with success, and who can provide all the tools and services needed but cannot be justified full-time.

The key focus for managers developing ODL material domains is to have a solution that embodies the use of open standards, single-source publishing (one solution all media), and is flexible enough to cope with whatever course designs come along. Good production management will create valuable long-term assets for an institution and a tutor.

Implication for tutors and students

Good quality ODL courses can save tutors a lot of time and effort if they are designed to support traditional teaching activities with self-study alternatives. They increase flexibility of delivery and help programmes to scale to engage larger numbers of students with new online or distance learning programmes.

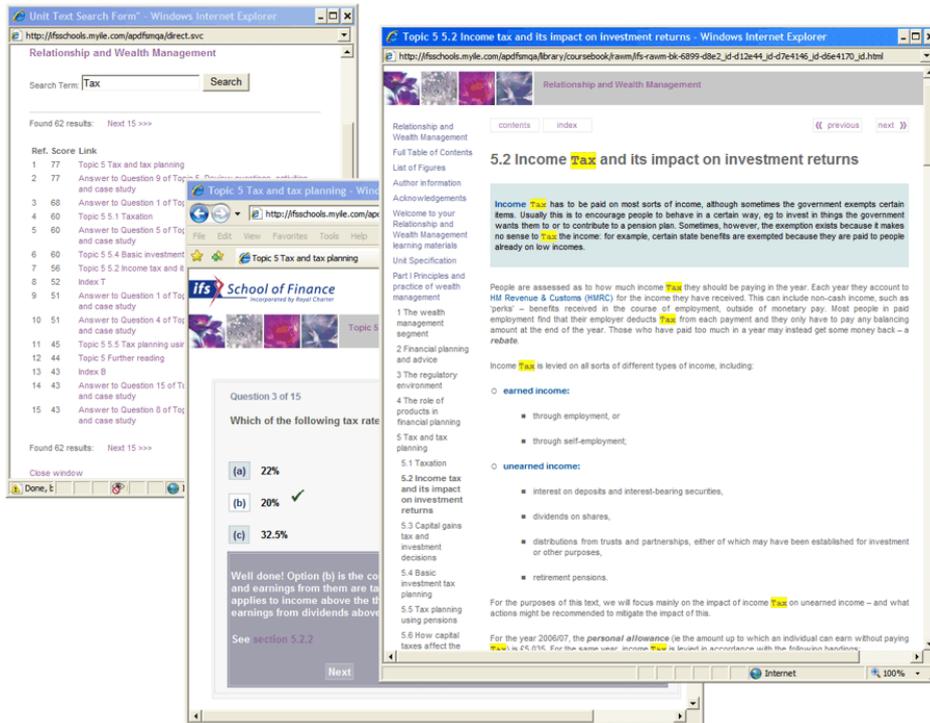
The illustration below shows a selection of Tutor oriented functionalities for an *ifs* School of Finance service targeted at 300+ secondary schools in the UK. Top left is a tutor only message board, helping them to share best practice and useful files in private. Bottom left shows how tutors can be allocated different types of tutoring roles in individual modules, providing them great self-administration flexibility and the ability to configure the teaching environment themselves. The illustration top and bottom right show summary reports auto-generated for tutors that show how a class is getting on with their ODL progress and assessments. Individual student test attempts and scores can be selected and browsed.

The screenshot displays four distinct tutor-oriented features:

- Top Left:** A private message board for tutors. It shows a message from Lauren (ifs administrator) regarding PFSM assignments and a reply from Pamela. The interface includes a 'postreply' button and a 'STAFF ROOM' icon.
- Top Right:** A summary report table listing student progress. The columns are Surname, Firstname, Last login, Progress report, and Test history. The table lists 14 students with their respective login times and progress indicators.
- Bottom Left:** A role allocation form for tutors. It allows selecting units and assigning roles (Lead tutor, Personal tutor, Web tutor, Workshop tutor, Examiner) using checkboxes. The 'Lead tutor' role is selected for 'Customers and their Needs'.
- Bottom Right:** A detailed test history report for a student. It includes a table of workbook assessments with columns for Topic, Last attempt, Score, and Best score. The 'Specimen objective test' section shows a score of 17/100.

Tutor-oriented features in an *ifs* School of Finance ODL environment for schools

Students appreciate working with more engaging learning materials that offer them personal learning experiences and can be studied at their own pace and place. Well designed courses also have a higher level of integration and consistency that is rarely achieved across a whole programme of different subjects. This improves familiarity with the materials and offers new online features such as search to aid study.



Full-text searching of content-rich courses including assessments

Summary

Designing and authoring for ODL means change but not as much as you may think.

Authors still author using familiar tools, but they need a new focus, templates, examples of good online practice and technical support. Developers use different tools (XML based ones) and a different single-sourcing perspective, but are rewarded by greater flexibility and productivity. Programme managers get greater flexibility and strategic new course and production team assets. Tutors and students get more flexibility and freedom to spend more time with other course participants.

Does this liberate tutoring? Yes, if done well using good designs, templates, good team support sharing a common workflow, open standards formats and a long-term asset-building domain perspective.

Does it restrict? The successful real-world examples discussed in this chapter suggest that this is not the case.