Moving beyond instructional comfort zones with online courses

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Conventional teaching and learning in higher education, that within our current comfort zone, has for many years been based around the design and development of courses and curricula which have been based on the presentation of knowledge and course content. The instructional models within most institutions have been based around lectures and content presentations. With moves to online learning, there has been considerable translation of existing materials and instructional strategies into electronic versions and forms. Such activities often fail to make use of the advantages and opportunities of the new technologies. They rarely take us beyond our current instructional comfort zone despite their capability to do so. This paper describes aspects of conventional courses and delivery strategies which often limit instructional effectiveness and suggests three main elements, inappropriate description of course objectives; the planning of courses around content; and the choice of inappropriate assessment strategies, as the principal factors impeding the development of quality online learning materials.

The paper provides strategies by which these limitations in existing courses can be overcome in a process of re-engineering into outcomes based approaches and forms more suitable for online delivery which provide enhanced opportunities for teaching and learning. The paper argues the need for designers to move beyond their comfort zones in such ways as the development of learning objectives which focus on performance and capabilities as intended learning outcomes and which make the course content and curricula a means to an end rather than as an end in themselves. The paper describes how the development of such objectives can provide opportunities for problem and task based learning designs, learning designs that support higher order learning outcomes.

Keywords: instructional design, learning design, authentic learning, outcomes based education

Introduction

There is a degree of criticism that can always be levelled at the quality of many contemporary online courses as a consequence of what appears to be poor instructional design (eg. Bonk & Dennen, 1999). The expanding use of the Internet and WWW has seen a rapid increase in the availability of online courses (eg. Noble, 1988) but improvements in technology and associated technical capabilities seem not to have been mirrored by improvements in the quality of the learning experiences offered to students. The WWW abounds with online courses whose learning designs and presentation modes fail to capitalise on the affordances offered by the technology and contemporary understandings of effective strategies for teaching and learning (eg. Mioduser et al. 1999). While many writer argue the need for more informed use of the technology and the application of more appropriate learning designs, the problems may require alternative solutions if they are going to be addressed fully. The purpose of this paper is to explore some possible alternative strategies for overcoming some of the more pressing problems with contemporary online materials.

Course planning and development in higher education

There are many ways by which courses and units for higher education can, and have been, developed. Toohey (1999) suggests that there are at least five different forms including discipline based, performance, cognitive, experiential or socially critical approaches. In most institutions of higher education, courses and curricula are planned and developed according to discipline based approaches following similar steps and processes. The process has typically been comprised of a series of sequential steps as shown below (eg. Toohey, 1999):

- a needs analysis;
- exploration of the needs of the target audience;
- determination of course content;
- establishment of course goals and objectives;
- choosing teaching and assessment processes;
- formative evaluation and redevelopment cycles.

In the case of the course and unit design for online delivery, the process necessarily includes the elements described by Toohey (1999), but the resource based nature of the learning setting often sees the addition of several steps to the process, particularly steps associated with an instructional design phase. Instructional design is the process of planning and creating learning environments for students that will cause them to engage with the course content and resources in ways which facilitate learning It involves the systematic development of instructional elements using learning and instructional theory to ensure the quality of instruction and learning (eg. Dick & Carey, 1990). The instructional design process is followed, and often accompanied, by a materials development phase during which the electronic resources are planned and developed.

In technology based curriculum development, the instructional design process sits between the course design and the development of the digital resources (Figure 1). Effective instructional design takes the course aims and objectives and provides a learning environment that provides both the forms of engagement and contexts needed to enable students to arrive at the intended learning outcomes in an efficient and supported fashion.

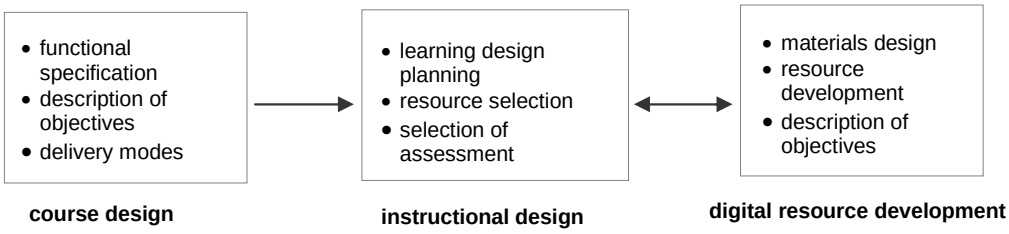

Figure 1: components of course design and development in higher education

Instructional design plays an important role in the determination of quality learning experiences for students. It is a process that draws strongly from established theories and proven practices. Instructional designers working in technology based settings are able to draw from a wealth of learning theories and learning models and technology capabilities to craft learning experiences to bring about intended learning outcomes for diverse forms of student audiences in a range of subject and discipline areas. Whereas in conventional courses, much of the course planning centred around the activities of the teacher, contemporary views argue that what is more important in a learning setting is what learners are doing rather than what the teacher is doing (eg. Shuell, 1992). There are a range of learning theories and learning processes in contemporary education informed by a variety of theorists and encompassing a variety of different forms and methods (eg. Figure 2). Contemporary learning theories provide guidance which can extend learning beyond the surface learning which appears to be characteristic of the transmissive modes of teaching that are associated with conventional courses.

In order for instructional design to be successful in the process of course and unit development, designers need to have certain freedoms and responsibilities in the selection of the learning experiences. This freedom requires courses and units with clearly and appropriately defined specifications and intended outcomes. Many instructional designers today are impeded in their activities by having to work with courses and units with poorly expressed and poorly defined specifications and outcomes. The ideal format for course design as shown in Figure 1 is too often replaced by versions of the approach described by Toohey (1999) which often leads to learning settings that are found wanting in many areas.

In many conventional courses, the instructional design process often fails to provide an effective form of learning setting. This paper argues that in many instances, the course and unit design stage is carried out in a manner which impedes the application of appropriate instructional design. This appears to occur as a consequence of three main deficiencies in the course design process:

theory	theoorists	learning processes	learning activities
behaviourist	Thorndike, Skinner	behavioural change, memorisation, knowledge transmission	Information access, content based approaches, lectures
cognitivist	Piaget, Bruner, Ausubel, Gagne	learning by doing, interactivity and engagement	learning by doing, modelling
constructivist	Von Glasersfeld, Lave, Brown, Greeno	experiential learning, knowledge construction	authentic tasks, situated learning
social learning	Vygotsky, Bandura	learning through social interactions, workplace learning	collaborative groups, mentors, learning communities
self learning	Merriam, Knowles	Student as agent of change and learning	lifelong learning, metacognition, self regulation

Figure 2: learning theories and processes in higher education

- the planning of courses using discipline based approaches;
- inappropriate description of course objectives; and
- the choice of inappropriate assessment strategies.

Discipline based curricula

In traditional forms of course and unit design, the content of the discipline has always played a very important role in the design process. In many instances, the content forms the basis of the curriculum and descriptions of the course are tied directly to the content that is contained. Such discipline based approaches to course design (Toohey, 1999) are quite easy to identify. Typically the course description will describe the content that will be covered and successful learning is adjudged by the scope and extent of the knowledge that has been acquired and can be demonstrated in an examination setting.

Teachers planning courses around content require very few instructional skills or expertise. All that is required is a delivery sequence by which students can be exposed to the content. Exposure to the content comes in various forms including classroom and lecture based modes where a teacher assumes a leadership role based on explaining and discussing the content to an attentive group of learners. Assessment of learning is typically based on examinations and assessments which seek to measure and assess the extent of the information and knowledge acquired from the course.

The online world (and the classroom world) abound with courses that have been planned and designed around their disciplines and subsequent content. Many researchers have documented the apparent high level of content based courses and have expressed concern with the poor instructional designs that they often include and the low levels of learning they are likely to achieve (eg. Mioduser et al. 1999). It is very easy to pick such courses at a first glance. Their characteristic features are:

- A syllabus comprised of a number of discrete sections of content;
- Large amounts of information conveyed in Web pages for students to read;
- Supplementary consolidation tasks and exercises that follow the information that seek to consolidate the material;
- Students working independently following a detailed schedule; and
- Assessment tasks that seek to measure the scope of students' knowledge acquisition through such means as multiple choice tests and other tests of knowledge mastery.

It is quite difficult to create engaging and active learning settings for content oriented courses whose aims seek to promote knowledge and skills acquisition as their principal aims. But there are ways to do this and there are many examples of content oriented courses which are based on constructivist learning theories. Such courses typically involve a range of learning activities that provide learners with purposes and contexts for engagement with the course materials. For example students may be required to work in groups to create artefacts and products that are based on applications of the content being learned. The characteristics of such a course might be:

- A syllabus comprised of a number of discrete sections of content;
- Large amounts of information conveyed in Web pages for students to read;
- Group based activities and tasks providing contexts for learners to learn through application of the knowledge;
- Assessments based on products and artefacts developed from the course materials and content.

While it is likely that students immersed in the more engaged learning setting described above, would develop a deeper comprehension and understanding of the course content and information, it is still not clear whether or not they might be able to use this information outside the course in which they have been enrolled. There is some potential for the information to have been well learned but that it might remain inert from any useful application.

There are many factors driving teachers today to maintain and preserve their content oriented approaches to learning. The courseware management systems that are currently being implemented (eg. WebCT and Blackboard) have been designed very much to support content oriented approaches. The interface for these tools provide quite distinct and prominent places for the content to be placed and the overall architecture is very much designed around the conventional forms of teaching and learning previously used commonly in paper based distance education programs. Current advances in the specification of learning content eg. SCORM and IMS are very much centred on processes and strategies for consistency in content management and delivery (www.adl.org).

Another influencing factor comes from textbook publishers who have discovered a lucrative market in the production of textbooks with Web based support materials. By their very nature, most textbooks have a strong content orientation and the Web resources that are being developed by the publishers to support their print based materials are based very much on content oriented learning processes.

With these forms of materials prevalent in higher education and with few alternative learning models to follow, it is not likely that in the near future, there will be any substantial change to the nature of online learning materials. The strategy that seems best to adopt for institutions wishing to pursue the development of quality online learning materials is to ensure that new courses and curricula are planned carefully in their developmental stages so that they can support more effective and meaningful forms of learning design.

Specifying learning outcomes and learning objectives

Biggs (1999) argues the need for learning aims and learning objectives to be the starting point for effective course design. The objectives typically indicate what the students will learn, to what extent it will be learned and by what means learning can be assessed. Ramsden (1992) argues that teachers need to be well versed in the objectives of any course being taught so that there is a common understanding between the teacher and students in terms of the goals to be achieved. Biggs (1999) describes the need for alignment between objectives and assessment where the level of understanding, skills and capabilities to be developed are explained to students by the learning objectives and where the learning and assessment activities are designed to achieve these objectives.

The development of objectives for courses and units is a very important task in the course design process and one for which there is considerable advice and guidance available. Given the importance of objectives as the basis for course design, it is very important from a quality perspective for courses to have well described course outcomes and objectives.

There is considerable information available that can guide course designers in specifying learning outcomes. The seminal work in this area is attributed to Mager (1975) who was among the first to describe the forms which objectives need to take. Mager (1975) argues the need for three elements in any meaningful learning objective: a statement of the terminal behaviour or performance sought; conditions under which this performance must be exhibited and the standard to which the performance should be performed. Using these elements in the specification of objectives creates strong contexts for the instructional design process and provides the means for assessing levels of achievement.

Too often though, the learning outcomes and learning objectives sought from courses and units are ill-specified. Often they lack a statement concerning the intended capability and performance and provide a very poor basis upon which any instructional design might be based. This point is readily demonstrated when one examines the course objectives of existing Web based units. Table 1, for example, provides a summary of the learning objectives for a number of courses in the World Lecture Hall, a collection of online courses and units from across the world. When one examines how the intended learning has been specified, a number of shortcoming become evident:

Problems which appear in the specification of these course objectives include:

- objectives written down in the form of learning processes rather than intended learning outcomes;
- a lack of specification of intended capabilities or performances;
- a lack of specification of level of achievement sought;
- objectives expressed in terms of knowledge to be gained rather than in terms of how that knowledge is to be applied or used; and
- a specification of the level of knowledge being sought with no indication of how that knowledge might be demonstrated or applied.

A number of writers have created taxonomies and frameworks that have sought to provide some distinction between learning outcomes in ways that can assist the teacher and the student in understanding the learning process. Bloom (1956) categorised a number of cognitive learning outcomes associated with learning. He described a series of six developmental levels:

- knowledge, an ability to recall, define, label list etc.
- comprehension, an ability to interpret information, explain express content in the learner's own words;
- application, an ability to apply information to a new situation;
- analysis, an ability to determine relationships, analyse, compare and contrast ;
- synthesis, an ability to draw conclusions from arguments, assemble, compose ideas etc.
- evaluation, an ability to make judgements using criteria, appraise, assess, defend, predict etc.

The learning outcomes offered by Bloom (1956) are presented in a form which describes learning from modes of instruction which have been highly teacher directed and transmissive. More recently Biggs (1999) has created an alternative set of learning outcomes which are intended for learning settings where learners acquire knowledge and construct meaning through personal experiences. Biggs (1999) describes the SOLO taxonomy (structure of the observed learning outcome) in five structural levels:

- prestructural, student misses the point;
- unistructural, student can identify, do simple procedures;
- multistructural, student can enumerate describe, list, combine , complete algorithms;
- relational, student can compare, contrast, explain causes, analyse; and
- extended abstract, student can theorise generalise, hypothesis and reflect.

Both forms of knowledge description indicate varying levels of cognitive development and outcomes that could be sought from learners and the forms indicate the need for precision and detail in the specification of learning outcomes. But the achievement of these forms of knowledge must be seen as a means to an end rather than an end in themselves and it is insufficient in the statement of course objectives to stop merely at descriptions of the scope and extent of knowledge gained. The specification needs to include some form of capability or performance and these elements are the critical components of the course objectives. Where knowledge is to be gained, the objectives need to indicate how that knowledge is to be used, under what conditions and by what means achievement can be assessed (eg. Mager, 1975). When course objectives lack these details, the instructional design process is hindered significantly and the resulting courses typically find themselves devoid of effective forms of learning design.

There is a growing move among many organisationsto move away from curricula whose outcomes are expressed in the form of content and skills acquisition, to curricula whose outcomes are expressed in terms of performance or capability. Outcomes based education (OBE) is an emerging trend in institutions seeking to create courses of study that are relevant and able to support transfer between the learning setting and the workplace. In the training sector, teachers have become accustomed to

Table 1: Sample course and unit objectives from the World Lecture Hall

Systems Design The main objectives of the course are: • To gain an understanding of … • To gain a basic understanding of … • To gain an understanding of … • To gain an in-depth understanding of …	**Applied Pharmacology** Upon completion the student will be able to: • Apply the principles of … • Discuss the indications, rationale, and risks for … • Analyse the rationale for …. • Describe strategies for ….
International Law Students in this course are required to: • To examine … • To further develop critical thinking skills in … • To further develop and employ research, writing and communication skills …. • To gain substantive knowledge in …	**Project Management** After completing this course, students will be able to: • Generate and refine a... • Develop and defend a …. • Compare and contrast … • Distinguish between/among … • Write and revise ... • Develop a plan for …
Information and Communications Policy After completion of the course material, you should: • Be familiar with ... • Understand the ... • Comprehend the main issues shaping … • Have developed an appreciation of … • Have developed the skills and methods to analyse, synthesise and evaluate …	**Educational Psychology** Upon completion the student will be able to: Define … and discuss how .. • Compare and contrast … • Draw and discuss … • Define and discuss … • Provide an overview of … • Name and discuss the …
Income Taxation • To gain a better understanding of … • To gain a better understanding of ... • To obtain a basic knowledge of … • To become familiar with … • To gain a better understanding of … • To gain an appreciation for …	**Computer Graphics** On completion of this unit students should be able to: • appreciate the driving forces behind … • understand the basic principles of … • describe the major methods by which … • explain the major components of … • be familiar with … • understand the particular characteristics of …

competency based learning, a form of OBE that defines large numbers of discrete competencies that are used to demonstrate the learners' achievements (eg. Cornford, 2000). In the school sector, outcomes based education is widely used since its introduction in the mid 1990s (eg. Griffin & Smith, 1997). Outcomes based education is now emerging on the higher education sector as institutions take more accountability for their learning programs (e. University of Western Australia, 2002). This paper argues the need for more institutions to follow this direction in curriculum reform as more and more opportunities emerge through the use of technology to support the delivery of outcomes based units and courses.

Assessment strategies

The assessment strategies that are associated with courses and units in higher education play prominent roles in influencing what students learn and the scope and extent of their learning. Too often we see a lack of alignment between the intended learning outcomes and the means by which learning is assessed (eg. Biggs, 1999). Furthermore, what and how students learn depends to a very large extent on how they think they will be assessed (Biggs, 1999). Given the importance of assessment in the teaching and learning process, it will not come as a surprise to learn that in the design phase of many courses and units for higher education, there are often inappropriate assessments planned and created, an outcome that often acts to impede the quality of the accompanying course instructional design.

There are a raft of assessment processes that can be used to determine the scope and extent of learning. Often institutional pressures and regulations stipulate to course designers the forms of assessment to be employed. In many distance learning and online learning settings, for example, teachers are required to include examinations as assessment strategies even in instances when they clearly fail to provide the forms of constructive alignment required between objectives and learning outcomes. There are a number of practical considerations and constraints which often force the hands of teachers in the choice of assessment strategies (eg. Hanson, Millington & Freewood, 2001). For example:

- the need for many forms of feedback including formative, diagnostic and summative forms;
- the need to provide scores for individual achievement as distinct from collaborative outcomes;
- the need to discourage and prevent plagiarism; and
- the need to ensure the identity of the person submitting the work for assessment.

When objectives are specified in terms of capabilities and performances, the forms of assessment that are appropriate to determination of successful learning outcomes are often of an alternative form to the more conventional forms to which many teachers and students may be accustomed. There are now a number of different descriptions for these alternative forms of assessment, for example performance assessment (eg. Elliot, 1995) and authentic assessment (eg. Herrington, Oliver & Reeves, 2002).

While many of the more commonly used computer based assessment forms can provide valid and reliable measures of knowledge acquisition, for example, multiple choice tests, examinations, quizzes, they are less able to provide valid and reliable measures of students' abilities to apply the knowledge in meaningful ways. Strategies for these forms of assessment tend to be require more qualitative than quantitative means. More useful strategies in these instances include case studies and problem solutions, collaborative project and portfolios. Many of these strategies can be integrated into the learning setting so that they occur as part of the learning more than as endpoints for demonstration of performance or capability.

Tasks used in performance and outcomes based assessment include essays, oral presentations, open ended problems, hands-on problems, real world simulations and other authentic tasks. Such tasks are concerned more with problem solving and understanding than in measures of knowledge acquired and retained. The essence of authentic and performance based assessment is that students produce evidence of accomplishment of curriculum goals. These assessment are characterised by meaningful and authentic problems and often involve students assuming responsibility for self evaluation. Students involved in self evaluation are more interested in the criteria and substantive feedback than the grades achieved. The interest is piqued by the need for honesty in the application of the criteria for others (peer assessment) and to their own work as well as being able to defend opinions through evidence over subjective judgements. Self assessment holds students to higher standards because the criteria are clear and reasonable (Wiggins, 1992).

The inappropriate or restrictive specification of computer based assessment requirements in the online course design process can provide significant impediments to the development of an effective learning environment. It is important in the specification of assessment strategies when designing courses to leave scope in the choice and decision making to the instructional designer to facilitate the alignment between the course objectives and the assessment strategies.

Re-engineering course design for online delivery

Courses that have been designed with any or all of the pitfalls described above, can make very poor choices for online course redevelopment. The restrictions imposed by the course design create the prospect of the online setting being an electronic form of the conventional setting and failing to take any advantage of the affordances of the technologies. Most stakeholders in online learning ranging from administrators through teachers to students can, and do, recognise the shortfalls and missed opportunities in such courses (eg. Collis, 1997). The solution to the problem is to re-engineer the course in ways that overcome the problems and the removal of the forms of problems described previously, for example, a discipline based content orientation, inappropriate objectives or assessment, the removal of which can quickly lead to a far stronger course design specification for the instructional designer process.

Practice suggests that most courses which have been designed with one of these problems, will experience all three in some way. Any course designed with a content orientation, for example, written around a textbook, will likely be designed around learning objectives which refer directly to content acquisition and have assessments which measure the extent of knowledge acquisition more than a capability or performance. This need not necessarily be the case but the various processes tend to be synergistic and complementary in the context of course design.

The strategy for re-engineering (eg. Collis, 1997) such courses is to take the course objectives and to re-express them in ways which give context, purpose and meaning to the knowledge. For example, rather than expressing the objectives in forms which seek to have students, understand the knowledge, the objectives should seek to express how the students might be expected to use the knowledge and by what means the scope and extent of the application can be judged. The emphasis in the learning setting is to move the emphasis away from *the content as an end* towards *the content as a means to an end*.

Table 2. shows the objectives from a sample Psychology course which has been developed with a content orientation. The course appears to have been designed around a text book and the objectives relate to students learning the content in the various chapters. This course is poorly suited to an online version in its current form. The content orientation has caused the learning objectives to be stated in terms of knowledge acquisition as distinct from any objectives relating to be able to use this knowledge in any meaningful way in real life settings. One would hope that the course designers might see some value in this course being reorganised in ways where some forms of performance or capability could be the intended outcomes. Table 2. suggests strategies by which the content focus could be re-oriented in a revision of the course to an outcomes focus. Outcomes based approaches require developers to determine what students will be able to do with the acquired skills and knowledge at the end of the course. They focus on student capabilities rather than teaching processes and strategies. Once revised, an instructional designer could then create a very effective and meaningful learning environment to help learners to achieve the intended learning outcomes.

Table 2: A content oriented course with strategies for possible re-engineering into an outcomes focus

Content oriented objectives	Re-engineering the objectives into outcomes
Students will gain an understanding of the major topics in psychology. The information and skills obtained from this course will give students insight into behaviour and will facilitate interactions with others. The course will prepare students to perform the following activities: • Evaluate the biological bases of behaviour. • Discriminate between sensation, perception, and consciousness. • Summarise research on memory, learning and thought. • Analyse motivation and emotion. • Describe theories of human language development. • Describe life span development. • Evaluate psychological disorders and therapies. • Evaluate the use of the scientific method in the study of human psychology	• What do we want students to be able to do at the end of the course? • How will they be able to use this information? • In what contexts will they be able to use the information? • What are some examples of real life cases and instances that students should be able to deal with this information? • What forms of activities and cases would provide students with the capacity to demonstrate the forms of competence or capability sought by the course?

Designing effective learning experiences

A course which has been designed with an intention to develop students' capabilities or performances provides many options for a creative instructional designer. A number of writers have sought to describe effective learning experiences from a cognitive perspective. For example, Savery & Duffy (1995) argue that there are four principles that necessarily underpin effective learning and derive these principles from learning theories that support knowledge construction as the descriptors of how students learning. Savery and Duffy argue that quality learning occurs when:

- learning is an active and engaged process;
- learning is a process of constructing knowledge;
- learners function at a metacognitive level; and
- learning involves social negotiation.

Others have sought to describe effective learning experiences from a learner's perspective. Boud & Prosser (in press) argue that quality learning is achieved when learners are involved in activities which:

- engage learners by supporting their intent and expectations, catering for prior experiences and motivation and the provision of socially engaging experiences;
- challenge learners to question assumptions, to discern variations, to go beyond what is provided and take ownership of the learning process;
- acknowledge context through the provision of appropriate problems and the situating of learning in meaningful contexts; and
- involve practice that enable learners to demonstrate what has been learned, to gain feedback as they progress and reflect on the experience and develop confidence.

When courses are designed using outcomes based ideologies and approaches, around objectives seeking the development of capabilities and performance, a clear option for course designers is to employ problem and task based approaches to support the learning process. In problem and task based approaches, the emphasis moves away from the content and information to its application and use. In such settings the learning objectives are usually expressed in the form:

- the learner *will demonstrate how to* …
- the learner *will design and build* the…
- the learner *will successfully perform* …

In order to learn how to do things and how to apply information meaningfully requires the learning setting to be cast in a form where the learner is required to act with the content in some deliberate way. Instead of simply listening or reading, learners are required to do things. Often the activity will take the form of a development task, for example, creating a document or planning and testing a strategy. Sometimes the activity will take the form of an inquiry, for example finding a solution to a problem.

Problem based and task based learning

Some teachers may feel uncomfortable with the notion of *problem solving* as a learning activity. Traditionally problems have been seen as difficult tasks requiring high levels of formal reasoning ability for successful solutions. However, as Jonassen (2000) states, "most psychologists and educators regard problem solving as the most important learning outcome for life " (p. 63). Jonassen (2000) describes a framework for problem types which provides a more comfortable and more useful description for many teachers. Jonassen describes problems ranging from those where learners simply apply rules to effect a solution, through problems where learners model solutions on existing cases to higher level problems requiring strategic and logical thinking. Such a typology suggests problem based approaches are applicable across a variety of curricula and courses and provides some guidance for teachers in choosing problems appropriate to the course and the level of learners involved.

The principal characteristic that distinguishes content based learning from problem and task based learning is the level of engagement of the learner. In problem and task based learning, everything that learners do requires some form of deliberate cognitive activity on their part. The learners read with purpose, they write with purpose, they use the information for some purpose. In content based learning, the learner is often passive and receptive. The content and information is presented as the focus of learning.

It is in such settings that instructional designers really get to ply their trade. Supported by objectives which specify what learners will be able to do and by what means this can be assessed, the designers are free to employ creative and engaging learning settings in a variety of forms (eg. Oliver & McLoughlin, 1999). For example:

- The learners can be cast with roles in a virtual workplace and where they are required to undertake some tasks and responsibilities;
- The learning setting can provide them with access to a variety of resources of an authentic nature which they can access to gather the information needed to carry out the tasks;
- The students can be supported by a variety of means including workplace mentors, collaborative teams comprised of peers and others;
- Assessment of learning can be based on the successful completion of the tasks and problems;
- Assessment can comprise elements of self assessment and peer assessment;
- The learning setting can be scaffolded in a number of ways to support learners as they develop the necessary skills and knowledge to complete the tasks being set and the support can be faded as the learners develop these skills;
- The setting can develop a raft of associated generic skills including capabilities to work in teams, to monitor their own progress etc; and
- The setting can assist learners in learning how to learn as they take responsibility for their own learning.

The technology provides many affordances to support learning in such settings. The technology provides access to the required resources in an organised and accessible fashion. It provides a means for teachers to support learners and for learners to communicate and become self sufficient. Once the restrictions and limitations of a course created by an inappropriate description and set of learning objectives have been removed, teachers can expect to see far better uses made of online technologies resulting in more effective learning environments supporting higher order learning outcomes.

Summary and conclusions

Conventional teaching and learning in higher education has for many years been sitting in a zone of comfort which many have perceived as being limiting in terms of achieved learning outcomes. The design and development of courses and curricula have and are, been typically based on the presentation of knowledge and course content. The instructional models within many tertiary institutions are organised around lectures and content presentations. This paper has described aspects of conventional courses and delivery strategies which appear to limit their suitability for online delivery and has argued that through the choice of more performance oriented objectives and assessment tasks, designers can move beyond their comfort zones to develop more quality learning materials.

The paper has suggested strategies by which the limitations in existing courses can be overcome in a process of re-engineering the course design into outcomes based approaches and forms more suitable for online delivery which provide enhanced opportunities for teaching and learning. The paper has argued the need for the development of learning objectives which focus on performance and capabilities as intended learning outcomes and which make the course content and curricula a *means to an end* rather than *an end in themselves.* The paper has described how the development of such outcomes based objectives can provide opportunities for problem and task based learning designs, learning designs that support higher order learning outcomes.

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