

Designing Online Teaching and Learning Activities for Higher Education in Hong Kong

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ABSTRACT

Instruction using the Web as a vehicle for content dissemination has increasingly dominated debates related to online learning (Nash, 2004) and there is little doubt that the exponential growth in the use of the internet and web-based instruction continues to present educators with considerable opportunities and challenges (Boettcher, 1999; McNaught & Lam, 2005). Many teachers and researchers (Wood, 1997; Littlejohn et al., 1999) point out that the organization and reflection necessary to effectively teach online often improves an instructor's traditional teaching. This is a theme continued by Downing (2001) who identifies the eventual success or failure of online teaching as largely due to the same factors that have always been central to the provision of a quality learning experience. These factors include the energy, commitment and imagination of those responsible for providing the teaching and learning environment, whether it is virtual or actual. It is within this context that the authors of this paper set themselves the task of designing innovative online teaching and learning activities which add value to the student experience and genuinely assist learning traditionally difficult and dynamic concepts.

The increasing adoption of outcomes based teaching and learning environments in universities around the world has provided wide-ranging opportunities to reflect on current learning and teaching practice. Whilst outcomes based teaching and learning is

not a new idea (Biggs, 1999), many academic colleagues are actively seeking ways to leverage information technology solutions to design constructively aligned online teaching and learning activities which add value to the student learning experience and significantly assist in the understanding of difficult concepts and processes. This paper will describe and demonstrate the innovative development of online teaching and learning activities which adhere to the principles of both outcomes based teaching and learning and constructive alignment.

Blended Learning

This paper concentrates on selected aspects of the continuing development of an innovative blended learning course, Biological Psychology, which combines on-line learning materials and face-to-face tutorials, using the principles of outcomes-based teaching and learning and constructive alignment to develop teaching and learning activities. According to Valiathan (2002), ‘blended learning’ is used to describe learning that mixes various event-based activities, including face-to-face classroom activity, online learning, and self-paced learning. The main tool for accessing the online component of this blended learning course is the learning management system, Blackboard Academic Suite. Blended learning seeks the optimum blend of self study, teacher-led events and group collaboration, each deployed in a blend of asynchronous or synchronous modes, appropriate for the learning outcomes. The three credit course, Biological Psychology, is constructed of ten units of on-line learning materials stored on the Blackboard Content System with students recommended to spend approximately ten hours studying each unit. A total of 7 hours and 40 minutes of face-to-face contact is provided via five tutorials which take place in weeks one, three, six, nine and twelve of a thirteen week semester. Each one of tutorials 1, 2, 3, and 5 is 1 hour and 20 minutes in duration with tutorial 4 lasting two hours and 20 minutes to allow for summative small-group presentations by student groups. The face-to-face tutorials provide learning opportunities in which students can directly address any particular problems related to coursework and learning strategy. Instructors provide concrete guidelines and advice on key areas of the coursework, defined by the intended learning outcomes, to students during the face-to-face tutorials. In addition, an asynchronous discussion board is provided on the Blackboard platform as an online component of the course to encourage students to engage in

discussion and collaboration with their peers and the course tutor. The asynchronous discussion board provides opportunities for a less pressured learning environment where participants can ask questions or contribute to debate at a pace which suits them, relatively free of the time constraints normally associated with face-to-face and synchronous learning environments (Downing & Chim, 2003).

Gandell et al. (2000) describe the extent of Web use in terms of the impact it has on learning relevant to the course. They categorise the extent of use according to the relevance and importance of learning outcomes appropriately addressed. Consequently, they identify five categories that represent a continuum of extent of use:

1. **Minimal:** Use of the Web that is neither relevant nor necessary to achieve any explicitly stated course learning goals and therefore has no impact on course-related learning.
2. **Supplemental:** Use of the Web that is relevant but not necessary to achieve a few explicitly stated course goals and therefore does not have much impact on related student learning.
3. **Integral:** Use of the Web that is relevant and contributes to achieving some of the learning goals in the course, and would have a fair impact on student learning.
4. **Central:** Use of the Web that is relevant and necessary to achieve most learning goals in the course, and would have a substantial impact on student learning.
5. **Exclusive:** Use of the Web that is relevant and necessary to achieve all learning goals in the course, and would have a major impact on student learning.

The extent of Web use for this blended learning course is in the exclusive category, in which the use of the Web is both relevant and necessary, and would have a major impact on student learning. The online materials (units) are both relevant and necessary to achieve all the learning outcomes.

Designing Online Course Materials

In this particular blended learning course, online teaching and learning activities are presented in a variety of formats including video clips, audio clips, images, animations, URL links, and power point presentations using the following general ideas:

1. **Hypertext Format:** Each course is divided into interconnected units, and each unit is subdivided into topics, while each topic is presented in a hypertext format, students can easily cross-reference different units and topics whenever and wherever they want. Whilst 'traditional' lecturing is often a one-shot event, online text is not, so students can control the pace of their learning within reasonable boundaries.
2. **Outside Resources Links:** Each online course provides links to other resources that provide additional and different voices. In this way, students are provided with multiple perspectives on a topic.
3. **Asynchronous Discussion Board:** Each course provides significant opportunity for discussing questions raised by the instructor or the students, through the discussion board. Traditional tutorials require almost instant reflection from students, but online discussion allows time for student reflection, and space for them to find additional information for better arguments.
4. **Multimedia Electronic Learning Materials:** Each course provides sufficient multimedia electronic learning materials to attain the best learning effects. Presenting materials in multimedia format can not only enhance student motivation in learning, but also allows more flexibility when designing course materials.

Online teaching and learning activities are a key element in all blended learning courses, and many of the better examples are presented visually as graphics or animations (Hung, 2002). One of the major drawbacks when teaching a course on biological psychology is that the graphical representations in a standard textbook are static so that the student normally has to follow a lengthy sequence of drawings in order to understand complicated processes such as human nervous conduction or synaptic transmission. Unfortunately, even when students have read and observed the text and the sequence of drawings, many still struggle to grasp the dynamic nature of these complex interactive processes. The authors therefore decided to focus on designing teaching and learning activities which maximized the benefits of an online learning environment, such as that provided by Blackboard, in order to add significant value to the student learning experience when tackling the task of understanding these particularly difficult concepts and processes. In so doing, they were guided by Tufte (2001) who identifies certain 'principles of graphical excellence', amongst which is the well-designed presentation of interesting information. Excellent visual information is classified as consisting of

complex ideas communicated with clarity, precision, and efficiency. Consequently, the authors designed the visual online teaching and learning activities to present the greatest number of ideas in the shortest time and within a small space. They also ensured that these online activities were constructively aligned with key intended learning outcomes for the Biological Psychology course.

Outcomes Based Teaching & Learning (OBTL) at City University of Hong Kong

Outcomes based teaching and learning (OBTL) is a student-centered approach for the delivery of educational programmes where the curriculum topics in a programme and the courses contained in it are expressed as intended learning outcomes (ILO's). Appropriate teaching and learning activities (TLA's) and assessment tasks (AT's) are then designed to directly encourage students to achieve the stated intended learning outcomes, and provide evidence which demonstrates the extent to which the outcomes have been achieved. The goal is to clearly and constructively align the ILO's, TLA's and AT's in a way which allows teachers to better facilitate active and responsible learning on the part of their students.

City University of Hong Kong has embarked on an ambitious and proactive institutional plan to implement outcomes based teaching and learning in all its academic programmes based on the concept of Constructive Alignment. 'Constructive' refers to the idea that students construct meaning through relevant learning activities and is based on constructivist educational principles. In other words, meaning is not something imparted or transmitted from teacher to learner, but is something learners have to create for themselves. 'Alignment' refers to a learning environment where teaching and learning activities, and assessment tasks, are linked or aligned to the intended learning outcomes through designing teaching and learning activities which assist students to meet the requirements set out in the intended learning outcomes.

Since most of the course materials are delivered online, it is very important that students take the initiative in crafting their own learning path and leading themselves to successful completion of the programme (Hmelo et al., 1997). In other words, students should take responsibility for their own learning. Therefore, the following general teaching and learning principles are also incorporated into the overall course design to

motivate student interest, develop generic skills, nurture lifelong learning attitudes, and enrich the learning experience.

1. **Traditional Information/Knowledge-Giving Teaching:** The use of online teaching and learning activities should assist course instructors to deliver the course materials in a user-friendly way. Therefore, it is essential that ease of access to materials and activities is given priority in the design process. The intended learning outcomes for each course should be stated clearly so that students are fully cognisant of what they are required to learn. There should be at least two online self assessment questionnaires (formative assignments) in each unit to assist students to acquire the fundamental knowledge necessary to deal with the problems set in inquiry-based learning.
2. **Inquiry-Based Learning and Teaching:** Inquiry-based learning and teaching is a student-centered approach which is well matched to online education and the outcomes based teaching and learning concept. In inquiry-based learning, instructors take the role of 'facilitators of student learning'. The students become active constructors of knowledge. In other words, instructors are responsible for giving sufficient guidance and for defining an area of inquiry. Students have to identify the problems, ask appropriate questions, look for the necessary information, and find their own solutions. In addition, one of the major advantages of inquiry-based learning and teaching is that it encourages students to become self-directed independent learners.

Aligning the ILO's with the TLA's

The Biological Psychology course has a total of seven intended learning outcomes each of which is clearly aligned with programme intended learning outcomes as identified in Tables 1 and 2 below:

Table 1: Course Intended Learning Outcomes (ILO's)

No.	Course Intended Learning Outcome	Related Programme ILO Nos
1.	Analyse the relationship between behaviour, physiology, evolution, function, and biology using psychological terminology.	1, 2 & 4
2.	Apply knowledge about the structure and function of the human nervous system to describe human behaviour.	1-8
3.	Describe the structure and function of the components of a neuron, axon, and synapse.	1, 2, 5 & 6
4.	Describe REM sleep, and the four stages of sleep.	1, 2, 5 & 6
5.	Critically analyse two major theories of sleep and dreaming.	1-5
6.	Analyse the relationship between biology, form and function.	1, 5 & 7
7.	Reflect on ethical issues raised by the study of biological psychology.	1, 3, 4, 5 & 7

Table 2: Applied Psychology Programme Intended Learning Outcomes (ILO's)

No.	Programme Intended Learning Outcome
1.	Critically analyse the five main perspectives and associated methods in the discipline of psychology and relate these to common fields of practice.
2.	Relate the usefulness and significance of applied psychology to a wide variety of professional contexts.
3.	Critically analyse the influence of the social and cultural contexts in which practice takes place on how psychological knowledge is applied.
4.	Critically relate and demonstrate appropriate application of psychological knowledge and practice to your own particular work setting.
5.	Critically apply psychological concepts, principles, and approaches to a wide range of diverse personal and professional environments.
6.	Apply psychological methods with rigour in gathering data, solving problems, and developing initiatives within various personal and professional settings.
7.	Reflect and articulate the importance of a commitment to ethical principles in psychological practice.
8.	Identify areas for personal and professional development.

For the purposes of this paper, we will concentrate on course intended learning outcomes numbers 3 and 4 and demonstrate how the online teaching and learning activities have been designed to align with these outcomes:

1. CILO 3: Describe the structure and function of the components of a neuron, axon, and synapse.
2. CILO 4: Describe REM sleep, and the four stages of sleep.

Whilst the action verb 'describe' would normally be regarded as a fairly uni-structural concept in terms of the SOLO taxonomy, with these particular structures, concepts and processes, it is treated as being of at least multi-structural level and possibly higher, and this is reflected in the assessment rubric for the course.

Online Demonstration of Aligned Teaching and Learning Activities

The online teaching and learning activities (TLA's) designed to align with these two intended learning outcomes (ILO's) will now be demonstrated by reference to the Blackboard course at the following URL: <https://eportal.cityu.edu.hk/bbcswebdav/users/scivanl/AP/unit01/menu.htm>

Two sets of TLA's will be considered for each ILO as an example of constructive alignment in action in an online component of a blended learning course. The first set are online teaching and learning activities in the form of animations and the second set are in the form of self-assessment questions which can be regarded as both TLA's and formative assignments designed to encourage student reflection on both the topic and their current state of understanding (Downing et al., 2007a).

Conclusion

The extent to which the authors have been successful is best measured against the outcomes identified for the design of the online learning activities which can be summarised as follows. The design of the online teaching and learning activities (TLA's) and instructional material should be:

1. in accordance with the principles of outcomes based teaching and learning (OBTL).
2. constructively aligned with the selected intended learning outcomes.
3. consistent with the exclusive category of blended learning identified by Gandell et al. (2000).
4. consistent with Tufte's (2001) principles of graphical excellence for communicating complex ideas with clarity, precision, and efficiency.
5. adding value to the student learning environment by designing teaching and learning activities which maximize the benefits of an online learning environment, such as that provided by Blackboard.
6. encouraging student reflection on both the topic and their understanding of it.

Whilst the authors have only been able to present a small sample of the exemplar Biological Psychology course, this nonetheless clearly demonstrates that creative use of online teaching and learning activities can add significant value to the creation of a student-centred reflective learning environment (Downing et al., 2007b) and facilitate improvements in achievement of intended learning outcomes within an OBTL framework. Of course, the most rigorous measure of success is the extent to which each **student** perceives the online TLA's as contributing to **their** achievement of the course intended learning outcomes, and the feedback received from two semesters of running this course attests to exceptionally high student satisfaction levels evidenced quantitatively by student responses to Teaching Feedback Questionnaires (TFQ's) and qualitatively through feedback from student representatives at programme management board meetings.

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