

OPERATIONALIZING CONNECTIVIST PRINCIPLES IN ONLINE TERTIARY COURSE DESIGN

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Abstract

In this paper we discuss the design of a fully online course – the Bachelor of Enterprise Learning – expected to be offered for the first time in 2014. We describe how connectivist principles guided design of active, student-centered learning activities for this degree that incorporate technology as both a source of information and a tool. Examples illustrate how these principles can be put into practice in developing learning activities, assessment tasks and whole subjects. We also discuss the value of using a framework such as this for providing consistency in subject design while still leaving scope for innovative and effective pedagogy.

Operationalizing Connectivist Principles in Online Tertiary Course Design

Contemporary tertiary course design requires consideration of many factors alongside content and structure. These include accreditation requirements, course outcomes, teaching approaches, assessment tasks and delivery methods, making this a complex and challenging undertaking. In this paper, we discuss using connectivist principles (Siemens, 2005) as a guide to designing a fully online undergraduate degree – the Bachelor of Enterprise Learning - for human resource professionals wanting a formal qualification in enterprise learning.

To equip graduates with relevant knowledge, skills, tools and experience relating to work-based learning in a range of contexts, the course needed to model practice in the field. Since connectivism addresses many of the challenges identified in organisational learning and knowledge management (Siemens, 2005), as well as specifically focussing on the role of technology in learning, it provided a framework that explicitly addressed how e-learning should be incorporated within the curriculum and defined the online course presence. A key part of the curriculum design was the use of e-learning tools to facilitate networking, knowledge sharing, critical consumption of information and continuous learning. This required understanding the affordance of different e-learning tools and designing appropriate learning activities and assessment strategies incorporating these tools, which leveraged the learning opportunities they facilitate.

In this paper, we discuss how connectivism guided the design processes and shaped the learning activities and assessment tasks; our goal is to demonstrate how this approach can assist in achieving contemporary and effective online course design.

Connectivism

In 2004, “Connectivism was presented as a new theory of learning that addresses learning in complex, social, networked environments” (Siemens & Conole, 2011, p. ii). Learning theories are important for guiding learner actions through the implementation of effective strategies (Wang, 2012). While there is debate as to whether connectivism qualifies as a new learning theory (Kop & Hill, 2008), a discussion that is beyond the scope of this paper, it does provide a framework for understanding how learning occurs that emphasises the role of information technology in sourcing and manipulating knowledge (Siemens, 2005). From a connectivist perspective, learning occurs when connections between ideas, concepts, opinions and perspectives are made, with technology having a key role in facilitating the connections necessary for learning to occur (Dunaway, 2011). Connectivism “stresses the development of ‘metaskills’ for evaluating and managing information and network connections, and notes the importance of information pattern recognition as a learning strategy” (Couros, 2009, p. 234).

Starting with the individual, connectivism describes personal knowledge as being made up of a network, which feeds into organisations and institutions (Siemens, 2005). These in turn feed back to the network and drive individual learning. *Knowledge* is viewed as the connection between information nodes, and where two or more nodes are linked to share resources a network is formed. The ability to create and engage with networks constitutes learning. A *learning community* can be considered a node where learners “will connect to a network to share and find new information, will modify their beliefs on the basis of new learning, and will then connect to a network to share these realizations and find new information once more” (Kop & Hill, 2008, p. 2). Key to effective learning therefore is the networks learners engage with and how they engage with them. Important skills for learning according to a connectivist paradigm are the ability to find current information, filter it and then make decisions based on that information. Being able to locate, manipulate and evaluate information and knowledge is important in the knowledge era, as is being able to integrate and apply this knowledge to work and life (Brown, 2006).

Siemens (2005) noted that technology is defining and shaping our thinking. He also noted that both the organisation and the individual are learning organisms. The conceptualisation of the organisation as being capable of learning and a source of knowledge is important for professionals working in learning and development roles. Being able to discern what information is important and what is not and to then incorporate that understanding in a meaningful way is also core to connectivism and a key element in course design activities.

Connectivism and Course Design

According to Dunaway (2011) connectivist pedagogy can be achieved through four practices:

1. Providing learners with diverse information sources, including traditional library and other scholarly resources as well as collaborative Web 2.0 technologies and user-generated content;
2. Situating these resources within an instructional framework that includes information literacy and personal learning network development;
3. Leveraging skills that are transferable across media, platforms and tools to expand students' learning networks; and
4. Developing a dynamic, technology-based knowledge community and learning network wherein students critically evaluate and synthesise concepts, opinions and perspectives.

Similarly, amongst the skills and competencies that Brown (2006) stated learners' need for a knowledge economy are the ability to know where to find information and to have effective strategies for searching for information. Learners also need to be able to expand existing models of thinking and to create inferences and analogies. They need to be able to make new connections through information analysis and synthesis and to create associations between thoughts, feelings, ideas or sensations (Brown, 2006).

Web 2.0 technologies are key to connectivist pedagogical practice. According to Tu, Sujo-Montes, Yen, Chan, and Blocher (2012), effective integration of Web 2.0 technology requires a learner-centred approach. They noted, "New technologies enable individuals to personalize the environment in which they learn, by creating and managing a learning network and appropriating a range of tools connecting people and resources to meet their learning interests and needs" (Tu et al., 2012, p. 14). The networks and tools learners use to create their Personal Learning Environments (PLE) allow them to control and manage their learning and set their own goals, to manage content and what is done with content and to communicate with others as part of their learning. Personalization and the use of technology are central to PLE, which in turn need to be aligned to and support achievement of learning goals (Tu et al., 2012).

According to Kop and Hill (2008) the "online and face-to-face networks that people build-up throughout their lives will provide expertise and knowledge, in addition to the guidance that local or online tutors can provide" (p. 9). Teaching using a connectivist approach requires that learners be at the centre of the learning experience, rather than the tutor or the institution. However, they also noted that the tutor has a critical role to play in providing alternate viewpoints to challenge and extend the learner. This learner-centred focus is an important element in course design where connectivist principles are followed.

The Bachelor of Enterprise Learning

The course we designed using connectivist principles is the Bachelor of Enterprise Learning. This degree is currently undergoing accreditation and if approved will have its first intake in 2014. The Bachelor of Enterprise

Learning will be offered in the Faculty of Further Education at Northern Melbourne Institute of TAFE (NMIT), which is a dual sector institute in Melbourne, Australia. NMIT offers a broad range of innovative higher education programs and hands-on technical and further education (TAFE) training. This degree is aimed at professionals working in business roles where training and development are a key part of their responsibilities. It was designed to be delivered online and offsite and includes core subjects relevant to adult learning in organisations. Graduates of this degree will be able to work in learning and development roles in organisational contexts such as Human Resource Management, Organisational Change Management, and Work Force Development.

On graduation, students will have a broad and coherent body of knowledge relating to adult learning principles, organisations, and the role of learning in organisations. They will have an in-depth understanding of how to apply knowledge, skills and experience to facilitate learning and development amongst employees to assist organisations to achieve their strategic goals. This knowledge will be complemented by knowledge of business fundamentals, context and needs. They will also have skills that allow them to be independent lifelong learners.

Throughout the degree a range of learning approaches are used in conjunction with overall curriculum design to develop these attributes in students. These include self-directed learning programs that model organisational training delivery, role play for students to practice and refine skills, case studies and simulations that provide structured exploration of important concepts and their application, and problem- and project-based learning where students apply their knowledge and skills to address a defined problem.

The Bachelor of Enterprise Learning has been designed as a three-year undergraduate degree leading to an Australian bachelor level qualification (AQF, 2011). It has been developed according to NMIT's Higher Education Degree Structure Policy, which states that a bachelor degree consists of 288 credit points and is generally conducted over six semesters. A subject with the equivalent of 3-4 contact hours per week over 12 weeks of teaching and one week of revision is worth 12 credit points. Accordingly, this degree consists of 24 subjects, with subjects consisting of topics grouped into modules with a common theme.

For all subjects in the degree, learning activities are structured to assist students to become independent and autonomous learners, while at the same time providing students with opportunities to develop a range of technical and professional skills. Teachers adopt the roles of facilitator, mentor, critical colleague and sometimes instructor as appropriate. Group-based learning for subjects in this degree includes team or syndicate-based activities, peer-led learning where students take responsibility for teaching fellow students, peer-support groups and communities of practice. Students develop their PLE to include peers from the course, work and professional contexts.

An additional consideration is for students to acquire skills in a range of tools and techniques that they can use in practice. Learning activities are designed to support students in accessing and applying these appropriately. The use of appropriate and diverse e-learning tools, together with the integration of tools and software applications into learning activities assists in providing students with the tools they need to be successful in their future roles. However, the online nature of this degree also presents opportunities for showcasing to students how to leverage information technologies to support design and delivery of flexible and responsive learning solutions.

The e-Learning Framework for the Degree

One of the first planning activities undertaken for this new degree was to develop an e-Learning Framework to ensure consistency across subjects in the degree with regard to the type of learning environment students experience, and to describe the types of applications that will help to create the required learning environment and enable students to acquire technical skills needed to work successfully in their chosen field. This framework has been used in subject development to support the design of learning activities and assessment tasks. The use of e-learning tools has also been informed by current practice in the field, whereby organisational learning practitioners should be using Web 2.0 applications such as social bookmarks, news feeds, podcasts, blogs, wikis and discussion forums, and social and professional networking applications such as LinkedIn (www.linkedin.com) or Plaxo (www.plaxo.com) as part of their personal learning network (Tracey, 2009). Therefore, it was important to expose students in a systematic and targeted way to these tools and for them to learn to use them effectively.

Creating a professional toolkit.

Students need to have opportunities to develop experience and expertise using a range of applications that support learning in an organisation. To do this, a professional toolkit was designed by the instructional design team (of which the authors were members) that included descriptions of and links to freeware applications such as file sharing and collaboration tools. The purpose of this toolkit is to assist students to develop an understanding of the range of tools available, how they can be used and when they are most effective. This is facilitated in two ways: first by exposure to these tools through learning activities set up by teaching staff and second by having students use them to complete assessment tasks. In first year subjects students are introduced to different types of applications and encouraged to use them at a beginner level. Most of these are part of their professional toolkit and accessible via the institutional web portal. By second year they should be familiar with a wide range of tools (including ones they have found themselves) and be able to determine which are best suited for particular applications or contexts. They should have begun building their own PLE which incorporate these tools. Students should be able to select and apply these tools and software applications effectively in the context of their major capstone project in third year.

Amongst the applications included in the professional toolkit that students will have familiarity with by the end of the degree are:

- Online publishing tools including video and audio podcasting, wikis and blogs;
- Resource sharing tools such as file sharing applications and cloud storage and sharing;
- Communication tools, including synchronous and asynchronous discussion and video /conference calling; and
- Tools for organising information such as reference managers (e.g., Mendeley), concept mapping and presentation software.

An important aspect of developing students' capabilities and technical skills is to ensure that they are able to recognise the features or functions that an application affords and determine how this can be applied to facilitate learning in a given context. One of the goals of the degree is to develop graduates who can "think outside the box" and be innovative and creative. To help achieve this goal, students need to be able to go beyond just using an application to being able to recognise the learning opportunities it affords and to design activities to exploit these. By being able to analyse an application according to its learning affordance, students will be better placed to adapt to new technologies as they emerge. Therefore, learning activities have been designed to facilitate students doing just this. Similarly, assessment tasks have been designed that go beyond assessing content and also incorporate assessment of process and application of tools. Some examples of how this is done within the degree are provided next.

Whole-of-Course Design Using Connectivist Principles

Connectivist pedagogy requires providing learners with diverse information sources, access to collaborative Web 2.0 tools and promoting creation of learning networks. In the Bachelor of Enterprise Learning, ways in which this is reflected include providing students with the following:

- Academic resources through access to library resources including databases, journal collections and e-content;
- Professionally relevant websites with resources and tools such as Emerald Insight's Learning Zone, the Centre for Learning & Performance Technologies' Directory of Learning & Performance Tools and Cloudworks;
- Collaborative tools for creating, storing and sharing content such as Dropbox, Slideshare and SugarSync;
- RSS feeds, newsletters, podcasts, blogs and wikis as both information sources and as tools for creating and sharing content; and
- Open-source and free tools to create content such as Pixorial for picture and video editing, Prezi and Open Office.

These have been incorporated into the course learning activities in ways that are designed to assist students to develop information technology skills that support their learning. Learning activities were designed to assist students to

source and evaluate information and technologies and to develop their personal learning networks.

In the following sections, examples are presented to illustrate how connectivist principles informed curriculum design for the Bachelor of Enterprise Learning. Curriculum design was undertaken taking a “whole-of-course” view to ensure consistency in the teaching and learning approaches and tools used in the course. This holistic approach also helped ensure a clear developmental progression across the degree and that learning activities consolidated and extended existing knowledge and skills in applied contexts. Examples of learning activities, assessment tasks and subject design are provided to illustrate how connectivist principles have been applied to achieve the desired learning outcomes for the course.

Connectivism in Learning Activities

Two examples of learning activities designed using connectivist principles are provided from the subject “Learning in the workplace.” The learning outcomes defined for this subject are that students should be able to understand and apply an action learning approach to workplace learning, identify organisational learning needs and define learning solutions to address identified needs. To achieve these learning outcomes the subject is structured around a five-stage Project Management (PM) methodology to illustrate how to design and deliver learning interventions in the workplace. Each PM stage is dealt with as a module, with activities based around a case study provided to help students to understand and apply these principles to a real-world example. Students also learn to use a range of other tools such as brainstorming and concept mapping along the way, as well as to compare and contrast this PM methodology with what they have experienced at work. The following learning activities illustrate how this is achieved by the application of connectivist principles.

Learning activity on approaches to organisational learning needs.

For this activity students conduct a desktop search for different approaches to addressing organisational learning needs. They are advised that they should look for journal articles, books, websites and other material and are provided with some key words to use in their search. They are also told that they can draw on their own experience of how learning occurs in organisations. From this they compile a list of approaches that could be applied to the problems identified in a case study that they have been given previously. They enter this information into a template and use this to map learning needs to the problems identified in the case study. Next, students write a summary of the approach they would suggest that the management of the company in the case study adopt. This is then shared with the other students online in a format of their choosing, with students encouraged to discuss and constructively critique other students’ work.

Learning activity on determining a learning solution.

The second example is a learning activity that students complete as a group. It requires that students conduct a virtual group meeting to decide which learning solution the group will develop a proposal for. This preparatory work

is important as it forms the basis for their learning proposal, which is an assessment task for the subject. At this meeting the team needs to do the following:

- Select a learning solution from the ones provided in a client brief;
- Decide what needs to go into the learning proposal;
- Discuss questions the team members have about the assessment;
- Draw up a comprehensive list of tasks to be completed;
- Allocate tasks to team members;
- Set timelines for completing the tasks in order to meet the due date; and
- Agree on a time and date for the next meeting.

Students can choose how best to conduct the meeting. Suggested tools for the online meeting include using a private discussion area in the learning management system, via Skype, email or phone conferencing. Students also need some way of sharing work product and are encouraged to look at using applications such as Dropbox or Google docs to help manage this aspect of the activity. Minutes of the meeting need to be written up as a formal record and all members of the team need to have a copy and agree with them. Some suggestions about templates for recording meeting minutes are provided for the students, although they can use their own if they prefer.

Through this learning activity students need to work collaboratively online to produce a required outcome. They need to manage resources and tasks effectively as well as to produce project artefacts and share them with all members of the group. This learning activity provides students with practice working in a group collaboratively and creating and sharing work product. Throughout the course and in their professional lives students will be required to work in groups and these types of learning activities provide students with opportunities to practice this. From this experience students can develop and refine these skills that are essential to being able to successfully complete the assessment task. By working in a group, the students are also expanding their personal learning networks. Since the course is fully online, providing opportunities to do this through formal learning activities and assessment is important.

Connectivism in Assessment

Two examples of assessment tasks designed with connectivist principles are provided from the subject “Designing Learning Environments.” In this subject students build on their existing understanding of adult learning from previous subjects and are introduced to the principles of learning design. There are six topics which are organised into three modules – “Designing for Learning,” “Designing for Engagement,” and “Designing for Assessment.” Learning outcomes for the subject include being able to describe the importance of learning design to successful learning outcomes and to discuss the relationship between learner engagement in the workplace and the design of learning environments.

The first two modules in the subject cover educational design principles that inform learning experiences as well as physical and virtual learning spaces from the perspective of curriculum design and development. These two modules lay a foundation for the third module on assessment practices. The subject mainly focuses on designing formal learning in the workplace, but does encourage students to also consider informal learning opportunities as well. There are three assessment tasks for this subject, two of which are discussed here as examples of how connectivist principles can be applied to assessment design.

Assessment task: Scoopit site.

The second assessment task in the subject relates to the first two modules on designing for learning and engagement. It requires the student to critique a topic from these modules that is of relevance to their current workplace and to provide a written summary explaining why the topic is relevant to them and their workplace. This summary provides a context for the second part of the assessment task, which is to create a “scoopit” site (www.scoopit.com) about the topic. The site must include at least five sites that the student has annotated / commented on as well as three exemplar sites related to their chosen topic that they are “following.” They then need to write a 1,000 word rationale related to the academic literature about why they selected the identified sites. In this way students are searching and evaluating information sources and then aggregating them to share with others. The Web 2.0 tool not only aggregates web feeds, it also provides the opportunity for commentary on a “scooped” site that is user generated. The task also requires that the student link what they have learnt to their workplace.

Assessment task: Collaborative team e-Presentation.

For the final assessment task in this subject, students work in virtual pairs on a learning design model for a specific learning event that they have been asked to present to a group of ten co-workers. The learning design needs to cover aspects such as content, learning engagement and learning spaces. From this the group needs to create a presentation that outlines the structure and method that will be used to meet the outcomes of the learning event. It must explain the learning outcomes, the learning design model and the rationale for choice based on the nature of the learning event in an accompanying statement. The presentation can be submitted in any format that is agreed by the two students, either online or in print, such as a collaborative video, a PowerPoint presentation, a Prezi, or a poster, but it must be submitted online via the learning management system. The accompanying statement can be presented in a 1500 word summary or a podcast or attached in any other appropriate manner to the presentation. A bibliography must be included and each team member receives the same grade. Again, this activity demonstrates connectivist design principles through the use of collaborative processes and tools to create content in formats selected by the group. It requires the group to share and reconcile different viewpoints in order to produce a coherent presentation. Creating the presentation requires selecting appropriate tools and being able to apply them effectively to achieve the desired goal and to meet the specific requirements for assessment submission.

Connectivism in a Subject

The last example is a final year capstone experience, which gives students the opportunity to consolidate their learning in this course and to demonstrate their capabilities through a major, self-directed project. Conducted over a full year, the capstone experience consists of two subjects for which students design, deliver and evaluate a major learning initiative to achieve specific organisational outcomes. In doing so, students draw on their learning from the course to demonstrate competency as an Enterprise Learning Professional. For the first capstone subject, students identify an organisational learning need for which they then design a learning solution specific to the organisational requirements. In the second semester subject, students deliver the previously defined learning solution and evaluate its effectiveness in meeting organisational objectives. There are several assessment tasks for the two subjects making up the capstone experience. In the first semester, students produce a needs analysis, project proposal and implementation plan. For the second semester subject, students produce a detailed learning solution, which they implement and evaluate. Self-reflection and self-appraisal are also assessment tasks in both semesters.

To complete this major project successfully, students need to draw heavily on all elements of their PLE. They need to access, synthesise and evaluate information from a range of sources to identify the learning need and design, deliver and evaluate the learning solution. They also need to draw on their network of peers, colleagues and professional contacts for advice, support and resources. A range of tools needs to be applied to the various parts of the project, including project documentation and the learning solution itself. Through this major project students are able to demonstrate and reflect on the maturity, sophistication and adequacy of their PLE in a professional context.

Challenges and Future Plans

There have been several challenging aspects to designing this degree. From a curriculum perspective, it has required considerable thought and planning to develop a coherent set of learning activities and assessment tasks across the subjects in the degree, which is a complex task with any course design. However, the online nature of this course adds a layer of complexity, particularly given the requirement that students develop extensive personal learning networks over the course of the degree. This requires facilitating student interaction through the learning activities in the absence of face-to-face classes or a formal timeslot for each subject. Online collaborative tools such as discussion boards, chat and conferencing have been used to facilitate student interaction. In addition, we have been careful to ensure that tools used in learning activities and assessment tasks facilitate learning and do not take the focus away from learning outcomes. The work we have done on mapping e-learning tools and applications to the learning outcomes they facilitate has assisted greatly in this regard. Learning activities and assessment tasks are designed with the learning outcomes foremost and any technology used as a means for helping students to achieve these outcomes.

A second challenge we have identified is the range of e-learning applications and tools students could potentially use as part of their course. While the

professional toolkit provides a basic set of tools, the intention is to have students personalise this toolkit with applications they have found themselves. Managing the different tools that students might use for assessment tasks is an area we have identified as a potential concern, as is providing technical and user support for students for a broad range of tools. We are also exploring ways in which students can modify and customise the professional toolkit as part of their PLE to ensure that this is accessible and relevant beyond the degree.

We are also conscious of the need to evaluate the effectiveness of using a connectivist approach for achieving the goals for the degree. Alongside continued subject development, we are working on an evaluation framework for the degree. It is our intention to use a variety of data collection methods as part of the evaluation, including focus groups, interviews, surveys and analysis of assessment tasks and learning artefacts. Evaluation of the course will be ongoing as part of NMIT's continuous improvement and quality assurance cycle.

Summary

In this paper, we have provided several examples that show how connectivist principles have been incorporated into the Bachelor of Enterprise Learning, a fully online course currently undergoing accreditation. The examples we presented illustrate application of these principles at the level of learning activity, assessment task and subject. All of the examples show structured approaches to supporting and encouraging students to create connections, use diverse information sources, synthesise concepts, opinions and perspectives and incorporate technology as part of their learning.

It is our hope that the first intake for the Bachelor of Enterprise Learning will be in 2014. In anticipation of the upcoming student enrolment in this course, we are currently incorporating connectivist principles to further develop the course subject matter. Having these principles to guide curriculum design has been extremely valuable. In particular, with multiple academics, curriculum developers and industry practitioners contributing to the development of subject material, having these guiding principles is essential for helping to ensure consistency, while also providing wide scope for designing appropriate learning activities.

The learning activities for the Bachelor of Enterprise Learning are designed to equip learners to source and apply knowledge when and where it is needed. Through the application of connectivist principles to course design it is intended that students will understand how to connect learning resources, which according to Tu et al. (2012) is as important as learning content in a world where learning for tomorrow is as important as what we know today.

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