



A framework for evaluating online learning in an ecology of sustainable innovation

George Bradford, Ben Kehrwald, and Stuart Dinmore

Learning and Teaching Unit
University of South Australia

In this session, a conceptualized framework is presented to provide an organization a tool by which to self-evaluate their online learning initiative. The tool is a methodology that leverages Ellis and Goodyear's framework, as well as leverages activity theory (Cole & Engeström, 1993), and a new categorization of online learning as described by Norberg, Dziuban, and Moskal (2011). The methodology is presented in sufficient detail to permit application to most any online learning implementation. A case study will be forthcoming, as this framework will be initiated in 2012 at the University of South Australia.

Keywords: Evaluation Framework, Ecology of Learning, Organization Self-Assessment, Online Learning.

Introduction

Ellis and Goodyear address the complex practice of “E-Learning,” alternatively referred to as “learning online,” “online learning,” “blended learning,” or “technology-enhanced learning” (TEL), within institutions of higher education, in an ecological frame. (In this paper, TEL is differentiated from online learning as the latter is used to specifically refer to LMS-type coordinated learning, and the former as referring to a wider variety of technology beyond the LMS orientation.) The argued need for an ecological perspective is rather self-evident: having the big picture view is necessary to best grapple with and manage the complexities of institutional practices, especially as individuals involved with the grappling and managing are likely caught between pressure to maintain flexible policy and to act aggressively, competitively. To understate, this is difficult work.

The need for such a framework is also self-evident. Organizations world-wide are adopting approaches to deliver teaching and learning using multiple modalities through the Internet. In the United States, 63% of institutions participating in a national survey administered and analyzed by the Babson Survey Research Group indicated they consider online instruction strategic for their institution (Allen & Seaman, 2010). The numbers say it best: in the United States, nearly one million more students are taking an online course in 2010 compared with 2009, and nearly 30% of all students take at least one course online. With consideration to this intensive shift in teaching and learning strategies, there is correspondingly considerable effort being invested in the development, implementation, and evaluation of programs to fulfill the goals of these online strategies. These

institutions would find a framework to evaluate their organization's efforts to achieve sustained innovative practice very useful.

This concise paper will review activity theory, a new online learning model, and Ellis and Goodyear's work to suggest a framework for an organization's self evaluation of their TEL or online learning practices. The purpose of such a framework is to permit organizations a method by which they may examine their support for sustained innovation.

Activity Theory

The challenge implied with adequately describing the actors and the relationships is in recognizing the complexity of a social ecology. For this, a suitable model can be taken from Activity Theory.

The basic frame of the theory builds on a mediational triangle with subject, object and a medium (or artefact/tools) at the vertices (Cole & Engeström, 1993). Depicted in figure 1, the Activity Theory Model includes the following vertices moving in a clockwise rotation from mid-left: subject, mediating artefacts, object, division of labor (or the different roles that exercise an influence on the subject), community, and rules. This model at once sets the actor and target action (or behavior) within a frame of the key factors having influence on the actor and target action.

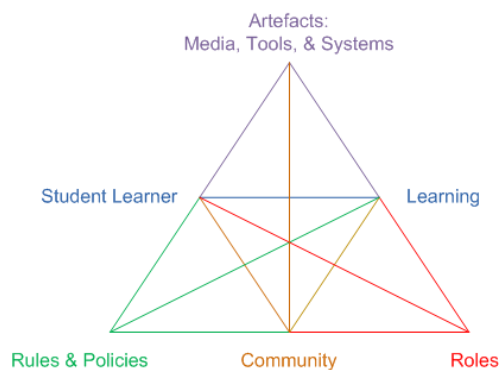


Figure 1: Activity Theory Model in context of the student learner in higher education.

Adjusting the model for a student in higher education, the student is the subject with learning as an object of active learning with an outcome target of new competencies. The influences on learning include the teachers, designers, tutors, administrators, and leaders (Roles) working to support the object target outcomes. Additionally, the student is a member of peers in the course(s) currently engaged, as well as study groups, or other clubs (Community). Naturally, course requirements, moral and ethical obligations associated with study and research, and institutional policies (Rules & Policies) also influence learning targets. Finally, activities will include mediators or tools to support learning (Artefacts), such as books, paper articles, audio and video source materials, and a myriad of technologies, such as learning management systems, both synchronous and asynchronous, and computer programs. It is arguable whether the pedagogy that orchestrates the use of mediators is part of the Artefacts, Rules and Policies, Community, or Roles since depending upon the details of the pedagogy, it could be a member of any of these vertices. In this article for simplicity, pedagogy can be considered a mediator for learning. The resulting model incorporates the key actors playing a role in student learning.

A Time-based Model for Online Learning

Blended learning more often describes teaching and course organization (Norberg, Dziuban, & Moskal, 2011; Oliver & Trigwell, 2005) and leaves for open discussion what “unblended learning” might be. Norberg et al. (2011) effectively argue against space being the key factor in learning as it always takes place where the student is. The more important factor is that the student and the components directing or influencing learning, such as the instructor, the places where students assemble to learn, etc, are orchestrated by time. As program and course directors adopt student-centred teaching models, an emphasis of *learning time* versus *teaching time* becomes necessary: given the increase of control over their learning, students progress in different ways and paces to advantage of their learning style preferences. The authors argue that “...as a result, learning space considerations might be deemphasized and replaced with time-related distinctions, building on synchronicity and asynchronicity, and focusing on a learning process” (Norberg et al., 2011, p. 12).

With this perspective, course structures can be examined by their synchronous and asynchronous blends of meetings and activities that can include technology enhancements (Norberg et al., 2011). Using this time-based approach, the authors identify five opportunities that influence the student experience. The five opportunities Norberg et al. (2011) identify are the following:

- Support – activities presented in a lecture that direct the student to conduct work beyond the lecture should be effectively supported using technology infrastructures, such as Learning Management Systems (LMS), blogs, drop-boxes, forums, twitter, etc. In an earlier time, the asynchronous work performed by students received minimal support.
- Migration – typical course designs tend to group activities as taking place during the meetings (i.e., synchronous sessions) or on the student’s own time (i.e., asynchronous sessions). With a time-based model and leveraging TEL or online infrastructures, traditional course elements offer an opportunity to innovate: sessions can be translated from one format to another to better advantage of resource use, such as changing traditional lectures into recordings that are later discussed in detail.
- Synchronous location – traditional course designs tend to assume co-location as a requirement. However, co-location should be thought of as an opportunity for innovation: co-location should not always be a requirement of synchronous meetings, as ICT can be used to provide access to distant students (e.g., video and telephone conferencing, online chat, and online meetings).
- Flow – often the design effort of producing courses and programs keeps a strong emphasis on the alignment of objectives with assessments. This emphasis, while critical for effective instructional design, can reduce attention to the flow between instructional strategies. When learning activities are connected, whether they use synchronous or asynchronous modes, those connections must be supported to be effective (e.g., a prereading of text for a planned synchronous discussion will be dependent upon timely access to the material, or preparation to work with the material).
- Learner empowerment – students are most effective when they can access all course content anywhere and at anytime. Their social networks are useful when studying or for enhancing direction and guidance originating from synchronous meetings or interactions. Further, learner empowerment reflects a fundamental characteristic of effective learning: it’s a means by which students take ownership.

With these five opportunities, an examination of TEL or online learning can be conducted regardless of mode. Further, the representation of these opportunities reflects learning more holistically than traditional approaches that tend to focus on teaching – the teaching elements are embedded into the full learning experience.

Ecology of Sustainable Innovation

Ellis and Goodyear (2010) take the completely reasonable position that avoidance of polarising thinking that yields indefensible contrasts, such as *new* versus *traditional*, *cognitive* versus *cultural*, or *technical* versus *human*, is best. The point is to bring focus to *relationships* rather than *differences* to better gain insight into problematic issues. Indeed, the concept of *ecology* is formed upon the relationships that comprise the system elements under study, in this case the sociological relationships inured to benefit students navigating TEL or online learning. From this approach, Ellis and Goodyear (2010) identify the key aspects of an ecology of learning as:

- **Balance** – given institutions’ directive of teaching, research, and service, an ecological balance on learning can naturally “enfold” the three directives. The details surrounding how a learning balance would lead to a natural inclusion of teaching, research, and service cannot be stated in concrete terms, as the interpretation of balance will vary in different organizations. The point here is that *learning as the goal* would provide the perspective to find balance between the three.
- **Self-Awareness** – when parts of an organization do not each recognize their contribution or necessity to successful goal achievement, the organization as a whole is not *self-aware*. Further, there is an assumption here that suggests some level of awareness to the relationships the other parts carry into the organization. If the balance is on learning, then every part of the organization “...needs to be imbued with an understanding of ‘good learning’” (Ellis & Goodyear, 2010, p. 20).
- **Feedback** – for the parts in an organization to recognize how well they are functioning, relative to the whole, they require feedback. Feedback acquired through systematic processes that communicate effectiveness of contributions creates opportunities for the organizational parts to learn. The origin of the feedback should be students, as well as internal and external stakeholders.
- **Self-Correction** – as organizations take action on feedback, they have opportunity for adjustment. Adjustments or self-corrections are re-alignments of operations to maintain a balance and focus on the organization’s mission.

The four aspects above are inter-connected, inter-dependent, and to some extent heuristically related. But the aspects further demonstrate that an ecological perspective is good: insights gained through its adoption provide opportunities for sustainable innovation.

An Emerged Framework

The framework emerges from consideration of the three presented elements: activity theory set into context of a TEL or online learning support organization; a design model focused on the student experience that uses time, rather than place, as its guiding characteristic; and an ecological perspective taken on the organization that emphasizes sustainable innovation. Below, we identify each information source where data can be collected.

Organizational probes derived from the Activity Theory Model:

1. **External roles** that support learning environments (e.g., technology support assistants, instructional designers or teachers, teaching assistants or tutors, and the various leaders – team leads, directors, course coordinators, etc.)
2. **Internal roles** (i.e., those a student carries in the context of learning, such as first-year, group spokesperson, technical specialist, etc.)
3. **Community groups** supporting learning with an external focus (e.g., course or class peers, peers in different course or sections, or those who have previously completed the course (and may be available through different venues, such as clubs or forums), special tutoring groups, and technical help desk services)

4. Community groups supporting learning with an internal focus (e.g., students may belong to other groups that lie beyond the organization, such as religion or cultural heritage)
5. Rules that govern student behaviour that are often part of the rhetoric of university-related work, course and program requirements (e.g., use of Turnitin to control plagiarism, assignment due dates, assessments, etc.), and ethics originating from peers, family, or culture)
6. Artefacts or mediators that support learning (e.g., suite of technologies, systems, materials, and media – take heed: this item can become quite extensive)

To reduce data collection requirements, as well as analyses, it would be useful and advantageous to rank each within their respective areas (i.e., vertices) to identify major influences. The manner of ranking will naturally vary, but the approach to conduct the ranking should be stated and followed to permit future corrections. With the final inventory, further inquiry using a time-based model can be made, and later if problems or opportunities are uncovered, this inventory can be examined for sources of influence.

Experience from the student's perspective using a time-based model:

1. Take an inventory of all course or program activities and catalogue them as synchronous or asynchronous.
2. For all activities identified as asynchronous, identify the support strategies used, both overtly stated within course materials and those assumed a student will also have use of, that ensure student's successful completion.
3. For all activities identified as synchronous, identify any opportunities a course designer or teacher might use to change it from synchronous to asynchronous to improve focus on critical aspects of what is being learned.
4. For all synchronous activities, identify the rationale for a co-location requirement: does the design require attendance at a specific location, or are other alternatives a possibility? If all activities are mapped or drawn on a chart differentiating between synchronous and asynchronous events, examine the flow between each. What directions or other course elements support the student moving between the succession of activities: is there such a flow, and is there a natural progression that makes intuitive sense?
5. Finally, when examining the full list of activities, where and how is learner-empowerment integrated? Are students given options and choices? How much material or resources are available at anytime and from anyplace?

Following the collection of data previously described, varied analyses may be conducted to identify problems and opportunities of TEL or online courses, programs, and the organizations supporting their delivery. Such analyses serve dual purposes: one is to improve the student's experience that may influence learning outcomes, and the other is to serve as data for how well the organization functions to innovate on a sustained basis.

Ecological practice of TEL or online learning:

1. Conduct an inquiry into how the practice of balance is practiced within the organization. Is the mission of the organization focused primarily on learning? Is the practice of learning directing teaching, research, and service opportunities, and not the other way around?
2. Of the parts in the organization, do they recognize their contribution in the success of mission attainment as demonstrated in the learning analysis? How much does each part of the organization know of the other, and does each recognize the role they contribute to the learning analysis findings? How often do the parts coordinate and share information?
3. What feedback mechanisms are in place to provide the organization they are doing well or not? (For this, the source will originate from analysis using the previously discussed activity theory and the time-based model.) How believable is that feedback – is the information authentic and credible? How current is the feedback? Do opportunities exist to improve the periodicity of feedback, without degrading its authentic and credible nature?
4. How does the organization, the part of the organization or in its entirety, react to the information? How often are changes made? Where are changes being made to practice, policy, technology, communities, or roles? Does the organization react to correct a change in the balance from learning to the trinity of

higher education foci (i.e., teaching, research, and service)? How often does the organization examine their balance and foci of activities?

Conclusion

This paper presents a framework by which an organization supporting TEL or online learning might self-assess to determine their ability to innovate on a sustained basis. While no specific analytics are presented, the framework provides some examples of the type and nature of data to be collected. Analytics will be varied and will need to be fitted to the nature of data collected. A case study will be useful by providing details with the analytics that are specific to the situation under study that other organizations could follow and adjust as needed. Such an effort is the next step to this project. Further, the framework has additional uses: by leveraging an activity theory approach, the framework can be adapted for a variety of organizations. The requirement for such adaptations will necessitate different models to exemplify the targeted object, in the case of this paper, learning using the time-based model.

References

- Allen, I. E., & Seaman, J. (2008). *Staying the course: Online education in the united states, 2008*. Olin and Babson Colleges, MA: Sloan-C.
- Cole, M., & Engeström, Y. (1993). A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (1st ed., pp. 1-46) Cambridge University Press.
- Dziuban, C. & Moskal, P. (2011). A course is a course is a course: Factor invariance in student evaluation of online, blended and face-to-face learning environments. *The Internet and Higher Education*, doi: 10.1016/j.iheduc.2011.05.003
- Ellis, R., & Goodyear, P. (2010). *Students' experiences of e-learning in higher education: The ecology of sustainable innovation*. New York, NY: Taylor & Francis.
- Norberg, A., Dziuban, C., & Moskal, P. (2011). A time-based blended learning model. On the Horizon. UK: Emerald Group Publishing Limited. <https://doi.org/10.1108/10748121111163913>

Please cite as: Bradford, G., Kehrwald, B. & Dinmore, S. (2011). A framework for evaluating online learning in an ecology of sustainable innovation. In G. Williams, P. Statham, N. Brown & B. Cleland (Eds.), *Changing Demands, Changing Directions. Proceedings ascilite Hobart 2011*. (pp.162-167). <https://doi.org/10.14742/apubs.2011.1857>

Copyright © 2011 George Bradford, Ben Kehrwald & Stuart Dinmore.

The author(s) assign to ascilite and educational non-profit institutions, a non-exclusive licence to use this document for personal use and in courses of instruction, provided that the article is used in full and this copyright statement is reproduced. The author(s) also grant a non-exclusive licence to ascilite to publish this document on the ascilite web site and in other formats for the *Proceedings ascilite Hobart 2011*. Any other use is prohibited without the express permission of the author(s).