Effective Practices in Course Redesign

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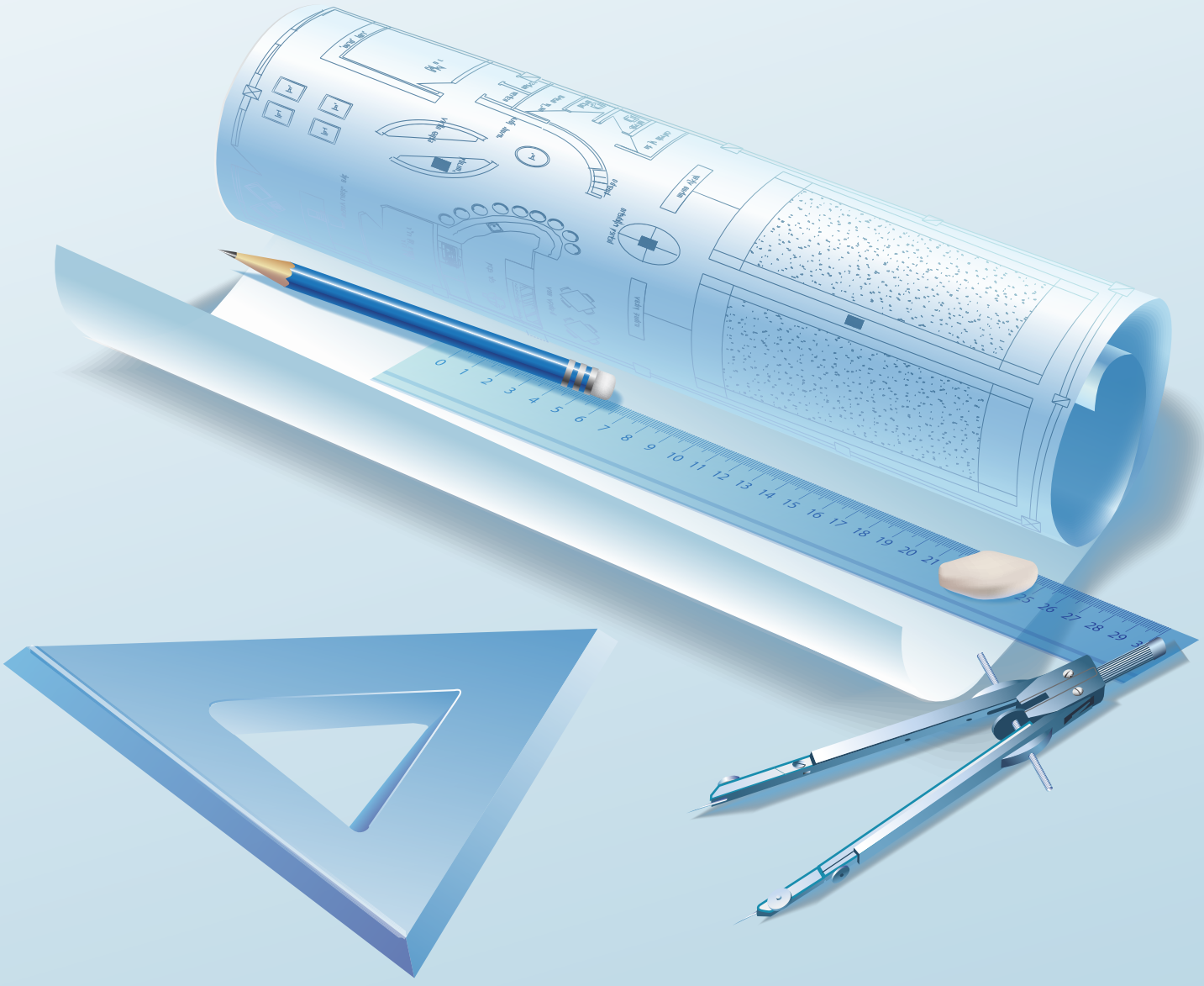

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Why Redesign?

Motives for redesign exist at every level of the institution.

From the individual faculty perspective, a better-aligned, more interactive course helps ensure that students are well-equipped to meet the learning outcomes for that course, and that the instructor is able to deliver a course as effectively and as elegantly as possible.

At the departmental level, faculty must ensure that students are attracted to and engage with their programs, are provided with the supports they need throughout their degree, and that graduates are meeting Degree Level Expectations.

At the institutional level, universities are under increasing pressure to do more—often with fewer resources, higher enrolments, and while in competition with other universities. In addition, there is greater pressure for accountability and demonstrable quality assurance. From this perspective, courses and even entire programs may be redesigned to ensure the institution as a whole is competitive, strategic, and economically viable.

At all levels, course redesign responds to the challenges of effective teaching in the current university context: there's an increasing awareness that trying to do more with less, respond to increased class sizes, work effectively with diverse student populations, and provide real opportunities for deep and meaningful learning requires us to rethink how we approach teaching (Kerr, 2011).

Course redesign offers the opportunity to restructure courses to meet these pressing demands: to continue to revise and improve, to stay abreast of and make use of state-of-the-art technology, to ensure students are engaged, active, and achieving significant learning outcomes, and that the course is running as smoothly as possible throughout.

In the pages that follow, key considerations around planning and implementing redesign will be introduced, with links to helpful resources and suggestions for practical tools and strategies that will help redesign teams consider how to address institutional, departmental, and individual goals for course renewal.

Identifying Goals

Below is a list of common reasons for redesign. Consider which ones apply to your context, and note those that are a priority. Add any goals that are important that are not listed here	Priority
Improve student retention and completion rates	
Align program curriculum	
Improve program reputation	
Develop community or industry partnerships	
Meet new accreditation requirements	
Deliver course material more efficiently or elegantly	
Provide students with the opportunity to engage with new technologies	
Make course schedules more flexible for students	
Ensure all sections of a large course are consistent in content, approach, and assessment	
Create a team-designed course that offers expertise no one person on the team could offer	
Sequence course content to help students build competencies	
Meet diverse needs of different learners more effectively	
Streamline administration to spend less time on bureaucracy and more time on teaching	
Promote higher levels of learning	
Offer authentic assessments that give students “real-world” experience	
Generate more opportunities for the instructor(s) to interact with students	
Provide more feedback to students	
Create more group work opportunities	
Encourage students to participate more in class	
Create a better classroom community	
Increase attendance at lectures	

Readiness for Course Redesign

Course redesign can involve instructors in re-thinking their courses on a limited basis or on a grand scale. On a small scale, redesign might involve only the kind of re-evaluation many instructors undertake at the end of a course they plan to teach again, to identify what worked, what needs revision, where students seemed to struggle, whether the timeline or assignments were appropriate. This document can provide useful guidance for these practices. On a more ambitious scale, redesign will involve all of those factors, but in the context of a much larger structural re-configuration of the course involving the implementation of new teaching organizational structures, technologies, approaches, and intended outcomes. The latter is a significant undertaking, and it is wise to consider individual and institutional readiness as a preliminary element of planning. The National Centre for Academic Transformation (2005) provides both institutional and course readiness criteria for determining whether a large-scale project is a good fit with the current situation.

On a personal level, readiness is also important: in part, this is a consideration of time, sense of support within the department, willingness to work collaboratively and to share course ownership, readiness to take risks and reflect on outcomes, and technological experience. One way to assess your profile as a teacher is to take the Teaching Perspectives Inventory, which provides a structured way to reflect on how your beliefs, intentions, and actions around teaching align.

Program and Curriculum Alignment

The first principle of effective course redesign is alignment. Whether the goals are to ensure a program is meeting requirements for accreditation or are aimed at simply improving student participation, ensuring the relevant components are working together in the most effective way is critical to the smooth functioning of a course.

All too often courses are designed and managed in isolation from each other, making it more difficult to scaffold or sequence content throughout a program, as well as to support ongoing development of student competencies. Additionally some courses, especially large courses with multiple sections, will suffer from course drift (NCAT, 2014), that is, where different instructors are teaching and assessing the material in very different ways. Because of this, courses need to be aligned within the larger curriculum and effective redesign begins at the program level. Ideally, departments will have (or create) a map of the curriculum and identify shared goals both for the program as a whole, as well as for the individual courses (Wilson & Wolf, 2009). This helps to ensure that all course offerings serve a clear purpose that is seamlessly integrated into a program of study that scaffolds student learning and provides alignment supporting student transfer of knowledge between courses.

Example: Law 2908
Carleton University

This course redesign was department driven as they found that multiple sections of this resource-intensive second-year course were inconsistent in quality. To address the problem, a "flipped" classroom was introduced, the majority of the teaching activities were posted online, and students met face-to-face for weekly one-hour active learning tutorials

With each course aligned to the program, the focus then turns to the individual course, where again alignment plays a crucial role, as learning outcomes need to be aligned with teaching activities and course assessments (see eg. Biggs, 1996; Fink, 2005). At the end of the process, each module of the course will fit together to support student learning throughout the course, the degree, and beyond.

For more information on curriculum and program alignment:

Biggs, J. (1996), "Enhancing Teaching through Constructive Alignment", *Higher Education*, 32(3), pp. 347-364.

Fink, L.D., (2005). *A Self-Directed Guide to Designing Courses for Significant Learning*, Dee Fink and Associates.

Wolf, P, Hill, A., and Evers, F., (2006). *Handbook for Curriculum Assessment*, University of Guelph

Envisioning the Classroom Environment

Curricular alignment is a critical element of effective course design: it's the fundamental path that enables students to travel to their destination. But a course is more than an aligned system of outcomes, activities, and assessment tools, it is also a culture, and a climate, and an ecosystem. How instructors proceed, and what

kinds of tools and processes they prioritize, will significantly impact the interactions in the course, how, one might say, knowledge will grow, circulate, and become embedded among the learners.

In deciding on approaches, there is a critical question to keep in mind: tools and activities inform the kinds of interactions users have, and the enormous variety of approaches and tools have to be viewed through the lens of the kinds of interactions an instructor hopes to create, and the kinds of learners instructors want students to become over the course of the term. This applies to tools in the technological sense, but also more broadly. For example, allocating the time and attention to develop and manage a peer mentorship program in a course is not a technological solution, but would create a quite specific interactional context. These choices should, as much as possible, be driven by a clear analysis of the kinds of learning that must occur and the climate most likely to facilitate that kind of learning (See, for example, Fink, 2003, for a discussion of situational factors that affect learning).

Collaboration

Depending on the goals for the redesign, effective collaboration may be essential to success. For example, in order to lay a strong foundation for students to meet required competencies, the University of Toronto Engineering Faculty redesigned a first-year course to, among other things, introduce real-world clients to their Engineering students, a class of over 1,000. The design of this course required collaboration at all levels, from the Dean, the faculty, and technological staff. Delivery requires over 50 people, including a course coordinator, communication coordinator, lecturers drawn from the Engineering faculty, tutorial leaders, seminar leaders and project managers drawn from the faculty and alumni of the Faculty, communication instructors, and teaching assistants (McCahan et al., 2004; Germaine-Rutherford, 2007).

> Ideally, large scale course redesign should not be left to an individual faculty member, but should involve collaboration from the department, faculty, and institution as a whole. (Twigg, 2003a).

Similarly, the creation of an online and collaborative model, “Total Pain” for inter-professional education in medicine drew on a team of subject matter experts from a variety of different disciplines, as well as narrative developers, e-learning designers, and a technology team (Thompson, 2009). The reality is that doing course re-design well often takes a wide range of expertise, no matter what the goals of the re-design are.

So, before undertaking course redesign, it important to consider whether the necessary institutional, administrative, and financial supports are in place, and to ensure that a team comprising the relevant expertise and authority is built (NCAT, 2014). It is critical that this team establish clear roles and responsibilities as well as a timeline and project plan.

Who needs to be a part of the redesign team?
Depending on the scale and goals of the redesign project, a variety of people may have critical input into the redesign team.

Department head		Accessibility staff		Academic Support Services	
Other faculty members		Educational Developers		Writers	
Technical support staff		Instructional Designers		Librarians	
Multi-media designers		Students		Community Members	
Programmers					

However, not all redesigns are large scale, and smaller incremental changes can be introduced by a single instructor who is keen to develop one aspect of the classroom experience for students. For example, an interdisciplinary course at the University of Windsor introduced competency building exercises, small group work, and peer mentors in order to help students build connections with other students, create a sense of belonging to encourage greater retention, and build transferable skills that students would take into future courses (Pugliese et al, 2013).

Making the most of technology

Rapid change in technology over the past two decades has generated a wealth of new opportunities both for improving pedagogy, as well as for administering and delivering courses more efficiently. With new tools, instructors can quickly gauge student comprehension on a particular topic, even in large courses, provide students with active learning opportunities both in-class and outside, administer and grade quizzes automatically, providing students with instantaneous feedback, and much, much more. Enhancing a course with technology can accomplish many goals from the most mundane administrative need, to ensuring important announcements reach students in a timely fashion, to pedagogical innovations such as immersive interactive environments providing real-world scenarios and decision-making opportunities.

With this wealth of technologies comes a vast array of choices and possibilities that need to be carefully managed. Understanding the level of support required entails a consideration of the multiple stakeholders in course development, including departments, faculty members, and students, in terms of their abilities, readiness, and requirements.

While enhancing courses with technology is often a key motive for course redesign, it is important to remember that technologies that are not properly administered and/or supported can cause more problems than they solve. Whether managing a fully online course, pairing face-to-face instruction with learning objects embedded in a local LMS, or implementing in-class technologies that alter the educational environment on campus, technological issues can overwhelm students, dishearten instructors, and complicate the day-to-day operations of the course. Technological tools should be chosen carefully, with detailed consideration of the role and challenges that technology will play in any given course and the pedagogical (or administrative) benefit it will bring. It's generally wise to bring a skeptic's eye to technology decisions, and consider whether the tool really is the simplest and most reasonable way to produce the desired pedagogical context or outcome.

Assessing Readiness for Technology

Because of the costs and risks of implementing widespread technological strategies, the project team should conduct an institutional readiness review before fully deciding what types and tools are most appropriate in large-scale course redesign. This process informs design choices: more technology-intensive approaches require better systemic infrastructure.

Assessing technological readiness within your learning community involves analysis at both the classroom and institutional levels. Where there are limited opportunities and resources to conduct that detailed level of prior assessment, frameworks such as the e-Learning Maturity Model (eMM) (Marshall, 2007) and the Canadian Recommended E-learning Guidelines (CanREGs) can provide a line of inquiry in reviewing institutional readiness for e-learning elements. These frameworks help the course re-designer to see the larger picture when thinking about technologies: to consider not just what technologies are directly available for learning, but issues like the level of technical support instructors can expect, institutional expertise in assessing and making

good decisions about technologies to engage with, the institution's track record with technology-enhanced learning innovation, long-term maintenance and renewal capacity, and the infrastructure that supports instructors as they build technology-enhanced courses. Similar frameworks are available to help institutions assess internal readiness when adopting other elements of learning technologies (e.g., Bossu, Brown, & Bull, 2013). Each of these frameworks attempts to balance institutional priorities, faculty and staff concerns, and student needs. Institutional readiness will vary: the impact of institutional readiness depends largely on the scale and the goals of the project.

Along with institutional readiness for technology is individual readiness. As it is critical for the instructor to be comfortable working with whichever technologies are employed in a course for it to function smoothly, the technologies adopted must be chosen with respect for the instructor's skill level in technical, administrative, and pedagogical issues in an online environment. Both the Learning House and Penn State provide helpful tools for reflecting on preparedness for course re-design involving hybrid (technology-enhanced) approaches.

Learning House, Distance Education Report: New Tool Assesses Instructor Readiness then Offers Training: a questioinnaire to assist instructors in assessing their readiness to teach online.

Penn State Faculty Self-Assessment: Preparing to Teach Online: a helpful framework for identifying strengths and needs and identify preparatory activities in preparation for a transition to technology-enhanced teaching and learning

Determining Availability of Ongoing Support

Because they place so many demands on both students and instructors, and because their failure can so completely frustrate learning, new technologies which impact the learning experience require ongoing, broad support. The level of support depends on the level of technology integration, but even one section of a course that integrates technology can have as high as a 4:1 or 7:1 ratio of support staff per course, including instructors, IT specialists, librarians, and administrators. For example, a proof of concept from New Zealand that sought to coordinate individual certificate programs in fully "networked", hybrid delivery determined that a minimum of seven people would be required per project team mounting a section of the program at one of the partner institutions (Tyler-Smith & Kent 2008; 2009). The roles identified in supporting networked delivery include instructors, project leaders, e-learning specialists, LMS advisors, administrators, librarians/learning services, and program leaders (Tyler-Smith & Kent, 2008, p. 4). These ratios vary considerably depending on the types of technology involved: frank and open conversations with learning technologies staff can provide a clearer sense of what's going to be required at your institution.

Choosing a Model

Enhancing a course with technology can be as small as posting course readings in machine readable formats to increase accessibility or as complex as reconfiguring the entire course for online-only delivery. Twigg (2003b) categorizes course redesign with technology into five different models based on the reliance upon and degree of integration of technology:

1. The Supplemental Model - Using technology to increase student engagement within a pre-existing course structure.
2. The Replacement Model - Shifting the load of instruction by increasing the number of online components within a course.

3. The Emporium Model - Advocating self-directed learning by replacing lectures and tutorials with an online resource centre and available tutoring.
4. The Fully Online Model - Moving all modes of instruction online, abandoning classroom interaction.
5. The Buffet Model - Recognizing different learning styles by offering an array of face-to-face, online, and hybrid instruction that the student commits to as a way of achieving each individual learning outcome of the course

Each of these models is well-tested and considering them may be helpful in clarifying the directions and options for your own redesign.

To determine which model a course should follow, it is again important to appreciate the challenges that technology can bring. Technology should not be employed for its own sake, but carefully chosen in order to maximize the learning opportunities in the course and supporting students in meeting the learning outcomes, with the least possible disruption or confusion. Choice of tools should be made with respect to comfort level of the instructor, available tools at the institution, learning outcomes of the course, availability of necessary software or hardware to the students, and, most importantly, the particular goals of the course redesign.

Meeting with learning technologies staff early in the process to explore the possible fit between instructor goals, level of engagement with technologies, and the institutional context can be a useful step in discovering a range of technological approaches and possibilities that instructors may not otherwise consider.

Some key questions to consider when adopting technologies:

(a) What technologies are available and already licensed at my institution?
(b) What types of activities do these technologies support?
(c) What level of proficiency, if any, can be assumed for the instructor(s) who will be teaching this course (including TAs, GAs, and other course leaders)?
(d) What level of proficiency, if any, can be assumed for the students who will be taking the course?
(e) What technologies would increase collegial and subject-level collaboration among staff?
(f) What technologies create more opportunities for learning?
(g) What technical support already exists for these or similar technologies within your institution?
(h) What is the risk of failure? What can mitigate it?
(i) How will I know if the students are benefitting from it or have learned using it?
(j) How can I integrate it with existing technology?
(k) Who will maintain it if I leave the situation?

For further questions to support evaluation of decisions around the use of technology:

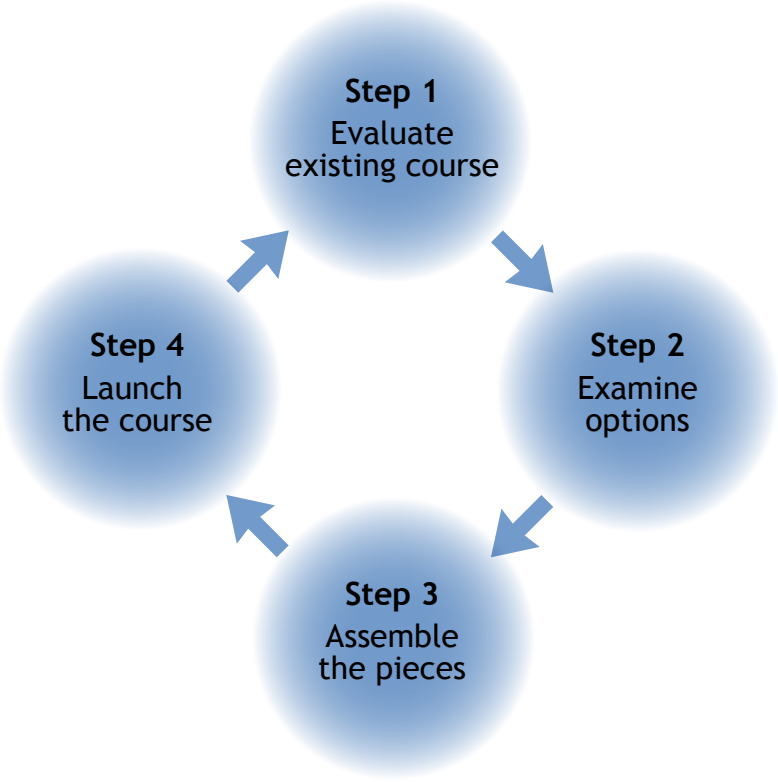
SUNY Learning Network, Online Teaching Survey

University of Wisconsin Learning Technologies Center, (2005). Hybrid Faculty Development Program: Ten Hybrid Questions to Consider.

Redesign Process

Overview

Successful course redesign is iterative and ongoing. Rather than treating courses as singular products, redesign proposes a cyclical structure for continued improvement as part of a sustainable process that considers student outcomes and institutional resources.



Step 1: Evaluate Existing Course

Redesigning a course is rethinking it, challenging assumptions about:

- how the course is structured,
- what materials would best support the learning outcomes,
- what delivery methods are most appropriate, and
- what students are capable of achieving in it.

Redesign is an invitation to think about what is happening in the classroom as compared to what you would want to happen.

Because redesign is re-evaluation, it is helpful to step completely outside of the existing course by breaking it down into all of the individual components—from course texts and resources, to lecture materials, assignments, and online tools—aiming to be as granular as possible. The goal here is to take stock of all the resources currently available, without assuming that the current structure and scheduling will be maintained, or that all current resources will be retained. This will help ensure that the new version overcomes any weaknesses in scaffolding or supports, and that new elements can be integrated throughout, rather than simply tacked on.

Examine Learning Outcomes

Evaluation first requires revisiting the existing learning outcomes to ensure that they are aligned to both the current program as a whole, as well as appropriate to the level and content of the course in question (see eg. Biggs,1996).

Examining Learning Outcomes Checklist	Yes
Are the learning outcomes consistent with program-level outcomes and needs?	
Are the learning outcomes appropriate to the level and content of the course?	
Do the learning outcomes reflect the goals of the redesign?	
Are the outcomes measurable and observable?	
Is the language concrete and specific?	
Do they clearly indicate the level of cognitive achievement expected in the course?	
Is the cognitive level of achievement expected appropriate to the content?	
Are expectations for procedural, metacognitive or affective outcomes also included (if appropriate to the course)?	
If there are affective outcomes, is it clear what product (outcome) will be assessed (as opposed to measuring "internal" outcomes that aren't measurable)?	
How will you know whether the outcome has been achieved?	

For more information on developing effective learning outcomes:

Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Addison Wesley Longman.

Biggs, J.B. and Collis, K.E (1982). *Evaluating the Quality of Learning: The SOLO Taxonomy*. New York: Academic Press.

Dee Fink, L. (2003). *Creating significant learning experiences*. San Francisco: Jossey Bass. P.33

Map Course Content with Respect to Learning Outcomes

With carefully articulated learning outcomes that are aligned to program and curricular needs, the rest of the course components can be effectively mapped to evaluate how well the current resources will help students meet those outcomes.

Table 1 below provides a partially completed example of a framework for categorizing existing learning outcomes, and identifying which learning items, activities, and resources of the course support those outcomes. Note that in evaluating course items, it is important to consider not just what outcome they meet, but what role they play (formative, resource, assessment) to help ensure alignment between the outcomes, activities, and assessments.

Table 1: Mapping Course Content. This example categorizes a sampling of course components by type of learning outcome

	Type of Learning Outcome						
Content	**Knowledge**	**Application**	**Analysis**	**Evaluation**	**Meta-cognition**	**Procedural**	**Affective**
Course Readings and Resources	Textbook	Multiple scenarios for case studies		Peer-reviewed articles evaluating concepts			
Lectures (whether in class or online)	Short videos defining key concepts						
Formative Activities		In-class group discussions			Learning journals		
Summative Assessments	Exam short answer questions to define terms	Exam Questions using Case Study	Written assignment asking students to analyze strengths and limits of different approaches				

The example provided in Table 1 uses online lectures to present and define the key concepts for the course, and the intended course learning outcomes are that students will be able to apply these concepts meaningfully to a variety of real-world case scenarios. As can be seen, one key assessment for this outcome is in the form of long answer exam questions requiring students to apply course concepts to the provided scenarios. Students are prepared for this assessment through in-class discussions and a learning journal for them to document their perspectives and rationales as they change over time.

Identify Areas of Improvement

Once all course items have been mapped according to the learning outcomes, the activities and resources that help students meet those outcomes, and the assessments that measure them, it becomes easier to identify whether

(a) there are any gaps, where students are expected to perform particular outcomes on a summative assessment, but have no other course material supporting that outcome. For example, in Table 1 students are asked to complete a writing assignment analyzing the strengths and limits of different approaches, but have not been introduced to a model of how to do this in their course kits, nor been instructed on how to do so in their lectures.

(b) there are extraneous materials in the course that can be eliminated because they do not support any of the learning outcomes, and are not assessed. For example in Table 1 above, the peer reviewed journal articles are required reading, but students are not tested on the analysis therein, but only on their ability to define, explain, and apply particular concepts.

(c) there are particular areas within the course that could be adjusted to meet the goals of the redesign. For example, if the goal of the redesign in Table 1 was to increase the critical thinking skills of students, it would be worthwhile to consider how some of the other components could be reworked to better support that outcome. For example, perhaps the learning journal exercise or the journal article readings could be altered so that they would be more closely aligned with the analysis learning objective.

(d) there are contextual factors that impact student learning which might be addressed through redesign. For example, if the course above were a large course or facing increasing enrolment, it would be worthwhile to consider how to ensure that students will receive sufficient feedback on their formative assignments to support their ongoing success with the summative assessments.

Assess technological components

With ongoing developments in educational technology, growth in the range of possible tools and their uses continues to accelerate. When assessing current technology use as part of course redesign, especially when applying technology to a traditionally face-to-face course, it is necessary to consider how it aligns with the course's desired outcomes. In addition, the tools must be manageable for the students and the instructor alike, and not overwhelm the course.

Tools and Technical Elements Checklist	Yes
Are the tools used in this course effective for helping students meet the learning outcomes?	
Are the tools the best currently available at your institution for the activities you've implemented?	
Are the online components well-structured and easy to navigate?	
Are all visuals (and alternative media) relevant to student learning and highly usable?	
Did students find it easy to navigate or use all of the technological components?	
Was there enough support for students if/when they did encounter technical difficulties?	
Does the technology currently employed comply with AODA standards (for example, provide transcripts for videos, scalable documents, and machine-readable formats)?	

Assess Course Context:

Moreover, courses come with their own situational factors (Fink, 2003), which can either facilitate or function as barriers to envisioned outcomes: these might be factors such as

- the size and scheduling of the course,
- the physical layout of the learning space,
- the programmatic expectations for how the course fits into an overall program of study or into accreditation requirements,
- the nature of the subject (e.g. practical, theoretical, controversial, open-ended)
- characteristics of the learners
- characteristics of the instructor

In establishing preliminary goals, context must be taken into account as it can have a profound impact on whether and how students meet their learning goals, and on the kinds of facilitation and mechanisms they will need to do so. Fink's *Self-Directed Guide to Designing Courses for Significant Learning* (2005) provides a useful approach to assessing these factors (p. 7).

Step 2: Select Teaching Approaches

With a clear sense of the strengths and areas for improvement in a course, the next step is to examine the teaching approaches and determine those that will best fit with the learning outcomes of the course and the goals of the redesign. This may, but need not always, entail the creation of new course materials. Either way, the main goal is to consider carefully which approaches will be saved, which can be improved to more effectively support students in reaching the higher-level outcomes, and which need to be added to meet the goals of course redesign.

The following are example strategies and resources to meet common objectives for course redesign:

To Respect Diverse Talents and Ways of Learning

One of the 7 principles of effective undergraduate education articulated by Chickering and Gamson in 1987, to recognize and address the diverse talents and ways of learning, is a common motivation for course redesign. This more inclusive approach to teaching is becoming an increasingly important concern as enrolments and class sizes grow and the population attending university becomes increasingly diverse. And, with the implementation of legislation mandating accessibility in higher education, such as the AODA regulation in Ontario, ensuring that our classrooms and courses are accessible by all is not just a principle of effective pedagogy, but a requirement of law.

Inclusive teaching recognizes the diverse needs and abilities of students and aims to accommodate these in all stages of the learning process while maintaining academic rigor (Burgstahler, 2013; Johnston & Doyle, 2011). Table 2 provides some concrete strategies to make your class more welcoming to those who may have a disability, an alternative learning-style, a language barrier, or who face other challenges to their success.

Table 2: Effective Strategies for Inclusive Teaching

Strategy	Description	Examples	Making it Work
Create welcoming classrooms	Recognition of diversity in the classroom, acknowledgement of it and open invitation to contact the instructor or access the many supports available help students feel at ease and take control when they need help.	Use inclusive language in the classroom. Include an accessibility statement on the syllabus, and take time to read it aloud in class. Encourage students to visit office hours and other student support services.	Encourage positive risk-taking and set high expectations.
Determine essential components of a course	Students may seek accommodation on one or more aspect of a course, and so it is important to be aware of what constitutes an essential element, without which the course loses key outcomes or academic rigor.	Provide a clear and descriptive syllabus that includes all essential information including goals, assignments, and expectations.	Make these essential components public information to help students determine from the outset whether a course is right for them.
Communicate clear expectations	Design instruction in a clear, predictable and straightforward manner, consistent with user expectations, knowledge, language skills or current concentration level. Reduce or eliminate unnecessary complexity or distractions.	Identify learning outcomes in the syllabus. Provide grading rubrics for assignments.	Aim for a well-organized syllabus, not necessarily an exhaustive one. Foreground key learning goals, assignments, and expectations right from the beginning. Avoid unnecessary jargon and provide a glossary for key terms.
Provide timely and constructive feedback	Students appreciate when instructors attend to the learning process, as well as the product, and praise instructors who offer sequenced or scaffolded assignments, rather than one heavily weighted assignment.	Use formative assignments. Use well-designed rubrics that clearly describe expectations. Ensure feedback gives students a clear sense of what they most need to work on to improve.	Anticipate mistakes that students will make and help them to overcome and make a learning experience from them.

Strategy	Description	Examples	Making it Work
Explore use of natural supports for learning, including technology	Students who have difficulties with processing and organizing material benefit by previewing lectures online or reviewing posted slides and resources.	Provide multimodal sources of information Include digital texts and audio files for reading Provide assignment choices with alternate ways to demonstrate knowledge	Provide proactive tech support Create mechanisms for peer assistance (e.g., Online Peer Mentoring/Counseling) Make use of concept maps, site maps, and embedded links for clarity and access.
Use varied instructional methods	Design teaching methods that consider diverse learning styles, abilities, ways of knowing, and previous experience and background knowledge	Use varied teaching activities, such as mind/ concept maps, guest lecturers, captioned videos or audio files with transcripts, active learning techniques, outlines and group activities in class (and online). Take breaks in longer classes	Ensure all course materials are in accessible formats
Create multiple ways for students to demonstrate their knowledge	Assessment formats may privilege certain skill sets, and so including multiple formats will give students the opportunity to play to their strengths, as well as give them an opportunity to practice to develop areas where they are weaker.	Use a variety of formats in exams (e.g., multiple choice, essay, short answer) and other assessments (papers, group work, demonstrations, portfolios, and presentations). Provide students choices in assessment methods when appropriate.	Any alternatives offered should be equivalent in both difficulty and in the outcomes assessed.
Promote interaction among and between faculty and students	Interaction promotes engagement, as well as providing students with opportunities to learn from a variety of perspectives and develop their higher order critical thinking skills.	Foster communication online with discussion groups, project groups, chat rooms, and synchronous class meetings	Pre-posted lecture notes help students prepare for class and participate in small group discussions Students appreciate a moderate pace in lectures and time to reflect before answering questions

Burgstahler, S. (Ed.). (2013). Universal design in higher education: Promising practices. Seattle: DO-IT, University of Washington. Retrieved from http://depts.gpc.edu/cds/Universal%20Design%20in%20Higher%20Education.pdf

Johnston, Nancy and Tina Doyle. (Spr. 2011). "Inclusive teaching: Perspectives of students with disabilities." *Open Words, 5*(1): 53-60.

To Enhance Active learning

Active learning has been shown to be a key element in successful learning (Fink, 2003), and is also one of the seven principles of effective undergraduate education (Chickering & Gamson, 1987). Traditional lecture-based teaching, where students sit, passively listen and copy what they have heard into their course notes, has been shown to encourage a surface approach to learning, where the emphasis is on simple recall of information, and where students treat knowledge more as isolated facts to be memorized for the exam and forgotten soon after. In contrast, actively engaging them in working through problems, applying concepts, analyzing results, and drawing their own conclusions leads to greater motivation for students; as well as ability to integrate new concepts and theories; and to transfer their learning into new situations, courses, and beyond. Because of the power of active learning, increasing student participation and opportunities for engagement with the course material is one of the top motives for redesign.

Active learning techniques focus on problem solving, application of concepts, discussion, critical thinking. They can be integrated into classrooms, done asynchronously in the students' own time, or function as a part of formative or summative assessments.

Table 3: Example Active Learning Techniques

	In the Classroom	Online	Self-study
Writing	One-minute paper	Blogs	Literature Review
	Statement of confusion	Wikis	Lab Report
Discussion	Think-Pair-Share	Discussion Groups	Study Groups
	Debates	Online office hours	Group Project
Visualization	Flow Charts	Matrices	Concept Maps
	Image Quiz	Diagrams	Timeline
Reflection	Think-Pair-Share	e-Portfolio	Meta-Statement
	Re-order List Quiz	Learning Journal	Reflective Essay
Critical Thinking	Numerical Response Quiz	Break-out Group Problem Solving	Create self-test questions
	Peer Review	Argument Map	Critical Review
Games	Problem-solving contests	Jeopardy	Flash Cards
	Role-play	Simulations	Puzzle games

See Assignment Glossary for further explanations of techniques

See also Bean, J. C. (1996). Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom. San Francisco: Jossey-Bass.

Cameron, B. (1999). Green Guide No. 2: Active learning, Society for Teaching and Learning in Higher Education

To Engage Peer-to-Peer Interaction

Another key principle of effective undergraduate education is developing reciprocity and cooperation among students (Chickering & Gamson, 1987). With larger and larger classes, students are more likely to feel like "just a

number" or get lost in the shuffle, and may then be less likely to engage in a course. This not only affects student retention and completion rates, it also means that students are less likely to participate, or take advantage of the other resources offered in the course. Increasing peer-to-peer interaction counterbalances these issues by generating a greater sense of belonging and engagement. In addition, interaction provides further opportunities for active learning, facilitates self-reflection/meta-cognitive skills and helps to develop critical thinking.

Example Peer-to-Peer Strategies

Tutorials

Whether online or face-to-face, and whether informal or formal, tutorials allow an opportunity for students to share notes, discuss important concepts, and clarify their understanding by matching it against that of their peers. As they are facilitated by a TA or the instructor, they also help ensure that students do not go off track.

History, 0243110, Past to Present
Rob Nelson, University of Windsor

In this first year history course, peer mentors are enlisted from a third-year service learning course in leadership to mentor students in their first semester. The goal was to improve a sense of belonging for younger students, aiding in retention and success.

Peer-Review Assignments

Peer review provides students an opportunity to develop their abilities to self-assess and to think critically about the subject matter. As students may get bogged down in details or unrelated material, it is critical that the activity be carefully structured. Students will need clear instructions and a straightforward task. Using a rubric or checklist will help keep them focused and on task. Alternatively, providing a model or exemplar will help them to understand the expectations. As an example of an effective peer-review strategy, consider having students simply reflect back a thesis statement, argument, or overall conclusion, with questions.

Discussion Boards

Allow students to engage in asynchronous discussions, so that even when students are on a different schedule or in geographically disparate locations, they can still interact with each other. To keep discussions focused and relevant, ensure that each topic has clear prompts, with open-ended questions that invite multiple perspectives and considerations. Moderation from a TA or instructor is also helpful to ensure discussion remains productive, but needs to be balanced out of concern that students will defer posting their opinions and wait for the experts to weigh in. Students may need direct instruction and example posts to become effective contributors to discussion boards.

Wikis and Group Projects

Help students to develop collaborative and teamwork skills as well as giving them the opportunity to engage with multiple perspectives on course material. Collaborative elements involving digital or online publishing components can help to position students as producers of knowledge.

Peer mentors

Peer mentors are students who are either selected or volunteer to work with and assist their fellow students and to report back issues of note to their instructor. In many cases peer mentors are upper-year students who assist in courses they have already taken. Mentors can be an effective means of creating learning communities in (or out of) the classroom and serve to strengthen the feedback loop between instructor and student, especially in large classes where students might be intimidated to speak up to the professor. They can point to campus support groups, study strategies, and other useful resources that students can turn to when they need help.

Example Strategies for Managing Prompt Feedback

Group feedback

An effective way to provide feedback to a large class, or in a situation where many students are repeatedly making the same mistakes, is to take a few minutes during lecture to give feedback on an assignment to the entire group. Instructors can also take advantage of the opportunity to model thinking and self-checking procedures to prevent these errors in the future. The disadvantage to this technique is that feedback will not be individualized, and will not apply to all students. However, this technique may also be used to great effect as it is one way to provide feedback that is completely separate from their grades, and research shows clearly that this is when students are most receptive to learning from feedback (Butler,1988; Black and Wiliam, 1998).

Automated Quizzes

Pre-designed question banks can provide an excellent practice and self-testing tool for students that they can take as many times as they wish, whenever they wish, and still receive instantaneous feedback. For this to be an effective tool, questions must be carefully crafted to reflect course learning outcomes and to match with assessment expectations. While it takes a significant amount of time and planning to build these question banks, they can be used in subsequent iterations of the course, and expanded over time.

Automated marking

There are a few different options for automated marking, with differing advantages and disadvantages. One solution is automated commenting features on word-processing software. These are best used with caution, as stock feedback on low-level concerns has been shown to be the least effective form of feedback (Black and Wiliam,1998), and is often counter-productive.

More rhetorical comments that an instructor finds need to be made frequently can also be automated, allowing for both individual attention and more efficient marking, complete with digital records of all submissions and feedback.

Note: It is important to clarify ground rules at the outset, and ensure that mentors are not in violation of collective agreements or contracts at your institution. Also mentors should never reveal the names of students and only report comments that will provide formative feedback to the instructor.

To Give Prompt Feedback

Feedback has been demonstrated to be the single most important aspect for student learning (Hattie & Timperley, 2007), and prompt feedback is also cited as one of the 7 principles of effective undergraduate education (Chickering & Gamson, 1987). However, managing the load has become more and more challenging as class sizes have grown larger and larger. Strategies to incorporate more feedback opportunities for students, without adding significantly to the grading load of the instructors or TAs, often play a role in effective redesign.

However, it is not just the frequency of feedback or the promptness with which it is delivered that counts. For feedback to be truly effective, it must also be of high quality. Ideally, it will be clear and specific so that students understand what the comments are about, forward looking, such that it points to concrete actions that students could take to improve their work or their thinking. In addition, feedback should focus on the performance of the

student, specifically on one or two of the most important higher-order concerns that if addressed would make the most difference. This will help ensure that students are not overwhelmed by too much information, as well as give them direction on the areas that will lead to the most overall improvement. Also, to fully benefit, students must have the opportunity to act on the feedback a meaningful way, as this offers them practical and concrete opportunities to improve as they progress through the course.

Key Qualities of Effective Feedback:

Criterion referenced: Organize feedback according to explicit criteria that carefully consider the assignment and the student outcomes it is designed to demonstrate, and ensure these criteria are made known to students well in advance, ideally when distributing the assignment.

Focused on higher-order concerns: Avoid focusing feedback on punitive concerns with formatting and grammar where these are not the primary focus of the assignment. Orient comments towards the cognitive objectives of the assignment.

Rhetorical: Provide comments that facilitate self-assessment by engaging them rhetorically, focusing on what their work does, their rationale, and the choices they made.

For more information about effective feedback:

Black, P. & Wiliam, D. (1998) Assessment and classroom learning, *Assessment in Education* 5(1): pp. 7-74.

Gibbs, G. & Simpson, C. (2004).“Conditions Under Which Assessment Supports Student Learning,” *Learning and Teaching in Higher Education*, 1:3-31,

Hattie, J. & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research*, 77(1): 81112

Piccinin, S. (2007). *Green Guide No. 4: Feedback, key to learning*. Society for Teaching and Learning in Higher Education.

To Develop Assessment

Assessment is a core part of any course, and while alignment with outcomes is a necessary first step, assessment can be further developed with attention to needs for continuous feedback, engaging with authentic assessment, as well as ensuring inclusivity by offering assessment options in multiple formats.

There are two different parts to effective assessment: *formative*, which helps students build skills and mastery of course material to help them succeed, and *summative*, which measures how well students have achieved the outcomes.

Formative Assessment

Formative assessment, the in-process evaluation of student progress, provides a low-stakes opportunity for students to develop the necessary skills and experience with course concepts and methods in order to succeed at the more formal course assignments, as well as opportunities for students to receive continuous feedback to ensure that they are on track and on task. These need not be graded, although offering one or two points simply for completion may provide a needed motivator.

Some Examples of Formative Assessments:

Meta-statement: Prompt students to write a paragraph reflecting on how they would improve their assignment if they had the time or opportunity. This statement can be effective for encouraging students to take a step back from their work and evaluate it, whether they write the statement before handing in their assignment or after they have received feedback.

One-minute paper: A very short essay, usually written in-class without time for planning or revision. Key is to give students a clear question prompt and one minute to jot their answers. The goal is to engage their prior knowledge and prepare them for new material, or have them capture their first thoughts about a topic, to help them martial their thoughts

Statement of confusion: A version of the one-minute paper where students are asked to write for a minute or two on the concepts or material that most confuses them. If collected, these statements can be very helpful for seeing whether and where students are getting lost.

Online quizzes: A bank of questions where students can self-test their understanding of the material and receive instant feedback. Ideally questions will be similar in nature to those that are on the exam or part of assignments or regular homework and students will have multiple opportunities to review and answer them.

Summative Assessment

Summative assessment, in contrast, aims at measuring how well students have met the requirements of the course. While summative assessment is a learning opportunity itself, and can provide insights to carry forward into future courses, the feedback on a summative assessment tends to be more backward-looking, assessing the students' accomplishments in the course.

A few words about Multiple-choice questions (MCQs)

With increasing class sizes and need to provide multiple assessments throughout the term, with limited support for grading, multiple choice questions are becoming increasingly common. However, the danger with MCQs is that the focus of the questions will be on the lower-level cognitive outcomes such as recall or identification, rather than on the higher-order more significant learning outcomes.

Important considerations when writing MCQs:

a. What learning outcomes are actually being tested by the quiz questions?
b. Are these learning outcomes the most important and relevant to the course?
c. Are these questions similar to the types of questions students will be required to answer for summative assessments?
d. Are questions free of ambiguity?
e. Is there only one clear answer?
f. Are all questions carefully written, such that every option follows grammatically from the stem, is approximately the same length and complexity, and has substantive content?
g. Is feedback provided for all distractors that will help students understand where they went wrong?
h. Does feedback for the correct answer help students understand why that is the correct answer (in case, eg., they are guessing)?

For more examples and support, see

DiBattista, D. (2008). Making the Most of Multiple-Choice Questions: Getting Beyond Remembering, Collected Essays on Learning and Teaching, 1. (http://celt.uwindsor.ca/ojs/leddy/index.php/CELT/article/view/3190)

Runte, R. Designing Multiple Choice, How to Write Tests (http://www.uleth.ca/edu/runte/tests/)

Authentic Assessment

Authentic assessment aims to assess students' mastery of knowledge and skills, or their attitudes and values, through assignments that resemble as closely as possible real-world conditions or situations. The advantages of authentic assessment are many: perhaps the most significant is that the increased relevance and meaning for students motivates them to spend more time on task and to engage with course material in more depth (Wiggins, 1990; Wiggins & McTighe, 2006).

Example: Engineering at the University of Toronto (UofT)

UofT Engineering course, "Engineering Strategies and Practice", introduced real clients to their first-year engineering course to help students better understand the context and goals of the program as a whole, as well as to help them develop skills essential to successful engineering practice from the outset (McCahan et al, 2004).

Design for authenticity by including assignments that reflect pressing disciplinary questions and encourage students to grapple with real-world problems and scenarios. For example, using authentic data sets in labs can help students grapple with the challenges of interpreting often conflicting or ambiguous data better than many of the "canned" recipe style labs where students work with unrepresentative samples. One way of accomplishing this would be to combine all of the collected data in a given lab, but then have students write up their reports and analyses individually.

Another example would be inquiry-based or case-based methods that allow students to work through complex and "sticky" problems that have no one right answer, but many different interpretations that can be justified, depending on assumptions, goals, and types of evidence used to support conclusions. A more technological version of this would be a simulation that involves students in the exploration of complex practice through electronic or technological media. One example of this is the "Total Pain" module created collaboratively by the Universities of Ottawa and St. Paul, and which employs multi-media and narrative to engage students in an exploration of inter-professional perspectives on a sample patient.

Step 3: Assembling the Pieces

With a list of topics, relevant course materials, ideas for learning activities and formative assignments that students can complete to develop their mastery, plus summative assessments to determine whether and how well students have met the outcomes, the next step in the course redesign process is to re-assemble the pieces into a coherent plan.

Map Alignment and Timing

The approach employed here is a type of "backwards design" (Wiggins & McTighe, 2006) that first looks to the

outcomes of the course, and then works backwards to ensure those outcomes are supported and scaffolded throughout, and that the topics unfold in a way that helps students to see the connections between them, and build their competencies throughout the term.

Table 4 below provides a sample framework to help think through the schedule of a 12-week semester schedule. Note that there will not necessarily be content in every box, but on the whole there should be a balance between new content and the formative activities that students will employ to master it, as well as the assessments that will be used to measure their success.

Table 4: Sample Template for Mapping a Course Schedule

	Topic	Preparation Activities	Lecture Topics	Formative Activities	Assessments
Week 1					
Week 2					
Week 3					
Week 4					
Week 5					
Week 6					
Week 7					
Week 8					
Week 9					
Week 10					
Week 11					
Week 12					

When planning course activities, consider carefully which activities and assessments will take place during face-to-face or synchronous class times, and what can be done asynchronously, in the students' own time. (Another template that is useful for this is Fink's (2003) Castle Top Diagram.)

For example, lectures can be conducted in both a face-to-face setting or through recordings, which makes it important to consider which mode of delivery will offer the most value for students. If lectures are intended to primarily provide lower-level learning outcomes (eg. information that students must recall), then it may be more efficient to record these and have students view them on their own time; whereas if the lectures are designed to help guide students towards meeting higher-level learning outcomes (eg. making connections, identifying patterns, evaluating concepts and theories), then taking valuable face-to-face or synchronous time for the opportunity will be worthwhile. This requires a clear and critical assessment of the current impact of the lecture portion of courses.

Build Necessary Components

It is important to note that redesign does not necessarily mean wholesale replacement. While there might be a temptation to view redesign as "starting new", prudent course redesign should utilize existing resources wherever possible (Twigg 2003b).

In some cases, however, matching learning outcomes with course resources will reveal a need for a new, robust learning object, that is a self-contained item that provides students with a way to think about course content and demonstrate outcomes for assessment, such as a module, activity, or lab within a course.

A few key considerations when adding learning objects:

a. availability of existing objects which meet course needs, whether internally or externally, including materials from banks of open educational resources which should form a key part of material review;
b. costs associated with designing, supplying, supporting, and purchasing materials (technological or otherwise) relied upon by the learning object;
c. personnel requirements in design lead time, support, and implementation; and
d. intellectual property (IP) issues (i.e., publication rights, fair use, creative commons, and open resources) (Barker, 2002)

Determining the granularity of the resource chosen as part of redesign is also helpful for aligning learning objects with learning outcomes, as well as allowing for possible reuse in other contexts or for future iterations.

Streamlining with Technology

The following table presents ways to add technology to improve the efficiency of course delivery while still maintaining rigor and focus on outcomes.

Table 5: Some possibilities for meeting pedagogical goals through technological enhancement

Pedagogical Goals	Possible Technology	Challenges	Making it Work
Know course content	-Video lectures -Links to websites, readings, or multimedia explorations of concepts and context	- External links and sources can overwhelm students, particularly if their relevance is not clear, or if significant tangential content is introduced	- Ensure you have appropriate permissions and copyright access - Ensure content is accessible and AODA compliant
Expand on or apply key concepts	Blogs, Wikis	- Participation can be erratic, particularly if no marks are associated - Added grading demands, if marked	- Clear structure and expectations - Ensure familiarity with technology by teaching staff
Engage Students Actively in Course Material	Discussions Boards	- Keeping threads and topics organized and readable for students - Lack of participation	- Consider “how to” videos on using it - Relevant open-ended well-designed questions
Facilitate Pre-class Work	Videos, Quizzes, Surveys	- Student engagement if they get overwhelmed - Overloading pre-work and underestimating time needed	- Ensure expectations are realistic - Add variety - Involve grading component

Pedagogical Goals	Possible Technology	Challenges	Making it Work
Engage students actively during face-to-face lectures	Classroom Communication Systems (CCS) or Classroom Response Systems (CRS) (e.g., clickers)	- Consume class time - Not suited to summative assessment - More difficult to engage students at higher levels of cognitive thinking	- Test it out before use - Expect and plan for some tech failures - Use only for formative purposes - Ask more open-ended questions to generate discussion - Ask comprehension questions to gauge how well students are understanding a concept or theory before moving on
Engage students in or outside of the classroom	Twitter and other social media	- Requires significant set up or input is not readily visible to students - Can distract lecturer attention with too much extraneous "noise"	- Set ground rules for comments from students - Have GA or TA assist with monitoring and reporting - Bring selective tweets into LMS or class time for further discussion
Provide students with study tools for exams	Automated Quizzes	- Can provide instantaneous formative feedback	- Ensure questions are aimed at the relevant cognitive level for the course and are consistent with exam questions - Use ordered list or image quizzes to provide variety
	Student-generated self-study quizzes	- Can require significant infrastructure to implement for all students, particularly in a large class	- Once built, centralized infrastructure can support all courses
Encourage student reflection and development of meta-cognitive skills	Peer Review	- Coordinating can require significant administration time and effort (especially in large classes) - Students vary in their ability to give meaningful and helpful feedback	- For large classes, consider using peer review software (eg. Peer Scholar) - Structure the activity carefully so that students will focus on one or two key higher-order concerns - Ensure the focus of the activity is on feedback only, not grades, as the latter may violate collective agreements
	ePortfolios	- Often requires additional technical support for students, particularly if unfamiliar software tool is used	- Build in peer-to-peer feedback options or ensure the instructor has enough time to provide sufficient feedback.

Pedagogical Goals	Possible Technology	Challenges	Making it Work
Develop authentic assignments	Multimedia	- Consistently valid and reliable grading or rubrics are challenging to develop for multi-genre submissions	-Ensure allowed projects are commensurate in terms of outcome and skill requirements - and that students can have choices that allows them to play to their strengths

Streamline Course Administration

Technology can also be extremely helpful in making a course run more efficiently and elegantly. If there is a tool available to automate a common or repetitive task that takes an inordinate amount of time, take advantage of it. Time spent in mastering the new technology will pay off down the road.

Strategy	Why it's helpful
Take full advantage of your institution's Learning Management System (LMS) to automate routine course tasks	• Class lists will typically be automatically uploaded and updated through the registrar • Important course announcements and other communications can be sent to all students in one easy step. • Delivery of course materials, communications, or assessments can be automated and set up ahead of time • Grades can be automatically tallied and posted
Employ LMS (or related software) to manage student submissions	• A digital copy of all submissions will be kept on file, preventing loss • A record of the time and date of submission will be available in case of dispute • Digital submissions facilitate online marking, which can save time
Use plagiarism detection software	• Automated "originality" check can provide a form of "triage" in determining whether a student submission may have been copied from other sources.
Make use of tracking features	Most LMS will have some level of tracking possibilities helpful for • viewing whether students are accessing specific course content, and how often. • highlighting students who are struggling or failing to complete assignments, or who are otherwise at-risk in the course. • assessing frequency of participation in discussion boards and other interactive elements

A Word about Timelines

The scale of the redesign will determine the amount of time needed to plan, prepare, and build. eCornell recommends 8-12 weeks for a full scale redesign (Kingyens, 2014) and the Centre for Teaching and Learning at Penn State estimates 65 hours of instructor time and a 17 week window (Roche, 2010), but both also note that completion times can be highly variable.

To get a clearer sense of the timeframe needed to complete your redesign, talk to your instructional design team to get a better sense of the normal timeline and expectations at your institution.

Step 4: Launch the Course

Course redesign is an ongoing and iterative process that is aimed at improving student learning while streamlining administration and delivery. For a large scale redesign, it is often advisable to pilot a new course with a smaller group, and gather as much data as possible on student perceptions, their ability to meet the learning outcomes when compared with previous versions of the course, feedback from colleagues, and the instructor's own reflections on the problem spots.

Regardless of scale, however, each course redesign needs to be assessed to determine whether the implemented changes have led to the desired outcomes, and evaluated as to how it might be further improved. In this way, course redesign is a continual process of revision and improvement to reflect advances in knowledge in the discipline, in scholarship of teaching and learning, in technology for efficiently and elegantly designing or delivering course material, and in improving the teaching activities to maximize student engagement and learning.

Reviewing a course:

The design team should plan for some form of vetted, formal review of the redesigned course as it is implemented, whether as part of an ongoing action research study or through departmental and faculty bodies. Ideally, there will also be a plan to compare the new version of the course with past iterations in terms of overall performance or mastery of course content.

Student Feedback: Initial student feedback can come as early as mid-term, when an instructor can check in to see how students are managing with the course. This can be done with a detailed survey where the instructor highlights the particular areas of concern (such as the additions or modifications to the course) or a simple "Stop, Start, Continue" feedback form that allows students to articulate what they find is hindering their learning, what they would like to see added, and what is already working well for them.

End-of-term student evaluations can also be mined for information about the course as a whole succeeded, and where it is likely to be useful, can be supplemented with additional questions.

Feedback from Colleagues: Evaluating a course's effectiveness may also go beyond student evaluations by integrating a transparent feedback loop from trained faculty/staff and a regular review of a course's learning materials (Marshall, 2007). Ideally these reviews will both be structured according to institutional standards, but will also produce insights that will in turn inform those same standards.

Feedback from colleagues can also occur more informally through a peer review system or by inviting teaching and learning staff to come to the classroom and assess how the course is going through observation and consultation with the students.

Data Analytics: Most Learning Management Systems (LMS) have some level of tracking for online resources and this can be a gold mine of information about how often and when students are using particular resources, as well as the frequency and length of their contributions to discussion boards.

Some Questions to Evaluate a Course Redesign	Yes
Were the goals motivating the redesign met?	
Does student feedback indicate that the modifications are having the intended effect?	
Did students use the added resources that were made available to them? How often?	
Do my colleagues find that students who have completed my course are well-prepared for courses at the next level?	

Troubleshooting Course Redesign

Managing Change

Lack of consensus about the redesign among stakeholders at all levels, including students, faculty, departments and faculties, is one of the leading obstacles to effective course redesign (NCAT, 2014). Students, for example, may resist if a course requires them to adjust their actions and expectations in order to succeed. Or, where teaching effectiveness is not considered a priority (e.g. for tenure or promotion decisions), faculty may prefer to invest their time and energy elsewhere, especially if the traditional format seems to be working "well enough" (Kerr, 2011). Faculties or departments may balk at the costs of implementing new technologies.

To address these issues, it is key to demonstrate that the rationale for course redesign is to provide a solution to a recognized institutional problem (NCAT 2014), whether it is with respect to student learning, retention, completion rates, faculty workload, and so on.

One critical element of change initiatives in complex environments is being aware that individuals in different roles will view initiatives that involve changes to the normal course of operations in significantly different ways, based on their own perspectives and concerns. In developing momentum to support a change initiative, particularly one that involves significant investment of resources or changes to the way students or others work, consider the concerns of those groups carefully. Student learning is important to everyone: how it is articulated may be a function of its refraction through different lenses.

- A critical idea here is "adding value": while the initial outlay for a course may be a significant investment, the new model may increase instructor productivity, significantly enhance student learning and experience, establish collaborative teaching and learning contexts, or enhance collaborative or leadership capacity for the same or smaller implementation costs. NCAT (2005) provides a systematic approach to considering productivity increases and cost reductions possible through course re-design: although in some cases these estimates may not apply to the Ontario context, the overall principles of productivity improvement are valuable.
- Consider whether the initiative you are proposing will improve retention or student success, better meet the needs of diverse learners or non-traditional students, provide more flexible

learning opportunities, reduce student time-to-completion (for example by reducing student need to re-take courses they've withdrawn from or failed), or potentially function as a recruitment tool. These are critical concerns of most administrators: systematically gathering evidence of improvement in any of these areas can be a powerful lever for further support.

- Articulate why the approach might be of benefit to faculty in terms, for example, of front-loading preparation to ease the pressures of student marking or feedback, or at least offer a time-neutral approach to improving student feedback and experience over the long term.
- Include plans for researching the initiative, so that dissemination and publication can be part of the outcomes for instructors, but also so that you build up a bank of empirical evidence of why a specific initiative is valuable, which can then be leveraged to seek further funds for next steps
- Identify specific types of students who are typically in program classes, whom the new approach can potentially really help.
- Inoculate the system for change: talk to students, peers, and administrators about the innovative status of the course in advance, gather feedback and make changes along the way in response to that feedback, and be open about bumps you hit along the way, and what you're doing about them.
- Be aware that individuals may be reacting from an underlying sense that something of value is being threatened: individuals may associate the use of recorded lectures with the devaluing of instructor work, for example, and believe that support for conversion of courses to hybrid learning formats is a step towards the deprofessionalization of faculty (Feenberg & Friesen, 2012).
- Ask your finance department to provide you with ball-park figures of the cost to the university of losing a student in first year in terms of revenue, and note the impact of course failure on students' decision to persist, either within a program or at the university all together.
- Establish a successful track record by starting small and building a reputation for successful innovation: credibility is a critical part of leading transformative change.
- Explore all possible sources of funds outside of your own program: "found" money and institutional recognition are fine ways to inspire enthusiasm for change.

Limited Resources

Course redesign can require a fair amount of resources, especially at the beginning.

- Apply for any course redesign grants that are available through your institution or government
- Make changes incrementally to spread costs over a longer period of time
- Consider partnering with other institutions to developed shared courses

Meeting Technological Challenges

Technology fails. Sometimes the problem is with the technology itself, sometimes it is human error, either at the user end or because the wrong tool was selected for the task. But whenever technology is employed, there is always a risk that it will not work in the way intended.

The first strategy for this is to be proactive. Most, if not all, institutions will have support staff, whether in IT services or in your teaching and learning centre, who can advise you about which technologies to use, provide training on how to use them effectively, point to relevant user manuals and technical documents, and help pick up the pieces if everything collapses. Table 6 provides some further suggestions to manage common technological problems.

Table 6: Troubleshooting technology

Challenges	Description	Preventions and Solutions
Technological breakdown	Some technologies are more stable than others, but even the most stable will sometimes break down completely, or will not function on particular student devices.	Test, test, test, tools before implementing them in a course. Be aware of what technical support is available for that tool. Do not to base important assessments on unreliable technology, unless necessary, and even so, consider options for students who cannot make it work.
User confusion	New tools will inevitably lead to some confusion for the users.	Do not introduce a new tool for assessment unless you have provided opportunities for students to practice with it beforehand. Provide technical support resources, or advise students where they can receive that support.
Instructor confusion	An instructor who decides to add a new technology needs to be comfortable with the features of that technology,	Practice using the technology before introducing it into the classroom. Ask for a sandbox or practice area (if applicable) to gain experience in the features and quirks of the tool. Have a back-up plan in case first attempts to use it go awry.
Inappropriate tool for task	Many tools can seem attractive when they are brand new, but are not necessarily suitable for all teaching tasks.	Choose only tools that will help students gain mastery in course learning outcomes or that will help the instructor run the course efficiently and easily
Too many new tools at once	Despite many claims that the millennial generations are technologically savvy, students can easily become overwhelmed when faced with a series of new technologies all at once—especially if those tools are complicated, with many features.	Choose tools carefully, using those that either students are likely to already be familiar with, or that are critical to the course outcomes Provide support for the use of tools, especially new ones, by making them available before the course starts, or by providing tech support options they can access when the need arises.

Final Thoughts

Course redesign provides an opportunity to address a wide range of problems from institutional concerns about retention and completion rates to individual instructor's concerns about their students' participation, and everything in between.

Technology provides a number of useful solutions both for automating time-demanding tasks as well as for engaging students in interactive pedagogy. However, it is important to remember that while technology is often positioned as a cost-effective replacement for "traditional" means of instruction, integrating technology within course structure is not intrinsically a cost reducer (Twigg, 2003b). Technology can only contribute to increasing efficiency, enhancing productivity, and reducing costs when it is a function of conscious pedagogical choices that draw full institutional support.

Indeed, course redesign often comes at great cost, which means the real incentive is to improve the value of the course, so that it can do more with the same resources. This efficiency can come in the form of improved administration and delivery of the course, saving faculty time in managing groups, answering emails, providing academic support, and in essence through the intelligent assessment of bottlenecks and barriers to student learning that can be resolved through a combination of creative thinking, organizational planning, and supportive technologies.

Efficiency can also come in the form of improved learning for students, helping them to think critically and actively engage with course material to support deep and signficiant learning. This in turn will help them better meet course outcomes, and to successfully transfer that knowledge into their next courses, and beyond.

Either way, effective course redesign requires careful attention to context, to the alignment of the course and program, to outcomes, activities, and assessments, and to critically reviewing how a course currently functions in light of how it might. Course redesign provides an ongoing opportunity for students to make the most of their diverse talents and needs, to interact with their instructors and each other, to actively engage with course material, and to receive constructive and formative feedback that helps them to meet and exceed their degree level expectations.

Assignment Glossary

Argument Map: A form of concept map or a diagram that has students identify the connections between the conclusions and the premises and evidence. Arguments are an effective way to visualize complex arguments, and provide alternate formats that support diverse learners.

Classroom Response Systems (e.g iclickers, Lecture Tools): Great for in-class mini-quizzes. The technology can be used to give grades for either participation or for getting the correct answer, but this should be done with caution as there are possibilities of technical difficulties or misuse. Also, not all students have iClickers, so they might be required to buy one for the course.

E-portfolio: Encourages students to reflect on their learning process and develop their meta-cognitive awareness of their strengths and limits in mastery of course material. Students collect artifacts (written assignments, concept maps, feedback, images, etc.) from their course-work and learning experience and post them online with written narrative explaining their choices and how they reflect their learning. See also learning journals.

Learning journal: Encourages students to reflect on their learning process throughout the term. Students write regular entries in response to clear prompts related to course material or their understanding of it. Not only does a learning journal help students learn to articulate their thoughts and questions, it helps them to see the progress they've made and notice patterns in the course material.

Matrix: A grid or table that students construct in order to map the similarities and differences in concepts or theories according to specified criteria. Matrices can be very helpful supports for students when analyzing and synthesizing complex material.

Meta-statement: Prompts students to write a paragraph reflecting on how they would improve an assignment if they had the time or opportunity. A meta-statement can be effective for encouraging students to evaluate their work from more objective perspective whether they write it before handing in their papers or after they have received feedback.

Image quiz: A type of quiz that asks students to locate a particular item on an image or diagram.

Numerical response quiz: A type of quiz that can be administered through Classroom Response Systems (see above) or through self-testing (see below), that presents students with a problem or question that has a particular number for an answer.

One-minute paper: A very short essay, usually written in-class without time for planning or revision. Key is to give students a clear question prompt and one minute to jot their answers. The goal can be to activate their prior knowledge to prepare them for upcoming material or activities, or to give them an opportunity to reflect on a particular problem or concept.

Peer review: Peer review can be done in-class, outside of class, or through technology such as Blackboard or PeerScholar. Students will need to be coached on how to give effective feedback (rubrics and models are very helpful for this), and to ensure that all students participate, the exchange of papers should be organized by the instructor or TA.

Read Map: A concept map that helps students synthesize their research or course readings. Encourage students to draw and label the connections between their sources.

Reflection paper: A short writing assignment that can either be written in class or at home. Reflection papers are most useful for getting students to step back from the material to think about their own understanding of it (and strategies for moving to the next level) or patterns within it (developing a richer understanding). It is important to give students a clear prompt to help them focus.

Re-order List Quiz: A type of quiz that has students put a disordered list into the correct order. This can be very useful to check student comprehension of important processes or procedures, as well as a technique for helping them build editing and evaluation competencies.

Self-Test quiz: A low-tech version of the classroom response systems that is much harder to track and grade, but much easier to administer. Simply ask students a series of questions and have them write answers in their notes. Then go over the answers with them, so they can check their own work.

Statement of confusion: A version of the one-minute paper where students are asked to write for a minute or two on the concepts or material that most confuses them. If collected, these statements can be very helpful for seeing whether and where students are getting lost.

Think-Pair-Share: The goal is to give students a chance to collect their thoughts, and then pair up with a partner to discuss their ideas. This activity is very useful for encouraging all students to participate in discussions.

Wikis: Collaborative web pages that can be used for group projects. Wikis are ideal for students who do not live in close proximity or who have conflicting schedules, making it difficult to work on the project at the same time. Also, as participation and editing in wikis is tracked, the contributions of each individual is transparent.

Re-Design Evaluation Checklist

Preparing for Redesign	Yes
Has the importance of the redesign been established among the relevant stakeholders?	
Are course learning outcomes aligned with the program learning outcomes?	
Have you identified which model of redesign you will be using?	
Is there a plan in place to track the effectiveness of the redesign for learning outcomes, as well as from the perspectives of students and colleagues?	
Course Structure	
Are the teaching activities and assessments aligned with the course learning outcomes?	
Have you mapped out exactly what knowledge and skills (e.g. research, critical thinking, writing, data analysis, technology etc.) students will need in order to successfully complete the course? Do you provide supports for those that you know students will struggle with?	
Have you sequenced your teaching and learning activities to support students in achieving the skills that are critical to your learning outcomes?	
Have you ensured that information is primarily transmitted through readings (or other media) that students complete on their own, while class time is devoted to active discussion and engagement with the material?	
Are the deadlines for assignments manageable for students, given the expectations and other commitments?	
If any students were derailed early on (for whatever reason, including illness, need for accommodation, misunderstanding of expectations, etc.), were there sufficient supports in place to help them recover and get back on track?	
Does the structure of the course provide multiple opportunities for students to interact (a) with each other, (b) with the instructor, and (c) with the content?	
Do the learning outcomes for assignments reflect those of the course as a whole?	

Assessment	
Are the critical thinking skills required to complete assessments commensurate with your expectations?	
Are your assignments based on authentic genres or tasks in the discipline? If not, do they have other characteristics that would make them compelling and engaging for students?	
Are your assignments tied closely to course material? If not directly, do you provide additional supports to help students make the transition to a new topic/theme?	
Are your assignments broken down into stages that correspond with your overall course scaffolding and main learning objectives?	
Have you provided appropriate disciplinary models or clear descriptions of the genre(s) you are looking for?	
For any written assignments, have you defined an audience? And if so, is that audience one that students will likely be able to address?	
Have you thought about how long it will take students to complete the assignment (or the various stages), and arranged to give them all the required information well in advance of your deadline?	
Are opportunities for students to receive continuous formative feedback built into your assessment plan?	
Is the weighting of the assignment appropriate to the amount of work that will be required for students? Is this true for each stage in the assignment?	
Do you have a rubric (holistic or analytic) that specifies your evaluation criteria?	
Does the feedback provided reflect your rubric or stated expectations?	
Will completion of all assessments accurately and reliably measure student achievement of all course learning outcomes?	
Technology	
Is the technology employed in the course currently most pedagogically sound option readily available at your institution?	
Is there a plan in place to train all teaching staff (including instructors and TAs) in the use and support of any new technology?	
Is there an introduction to new software or tools that will allow students to practice using unfamiliar technology *before* the course begins?	
Does the technology comply with all AODA standards (eg. provide transcripts for videos, scalable documents, machine-readable formats), and best practices for accessibility?	
For further questions relevant to redesign, consult the National Center for Academic Transformation, (2014). How to Redesign a College Course Using NCAT's Methodolgy.	

References

Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Addison Wesley Longman.

Barker, K. (2002). *Canadian recommended e-learning guide (CanRegs)*. Retrieved from http://www.futured.com/pdf/CanREGs Eng.pdf

Bean, J. C. (1996). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom*. San Francisco: Jossey-Bass.

Beatty, I. (2004). *Transforming student learning with classroom communication systems*. Retrieved from https://net.educause.edu/ir/library/pdf/ERB0403.pdf

Biggs, J. (1996), "Enhancing Teaching through Constructive Alignment", *Higher Education*, 32(3), pp. 347-364.

Biggs, J.B. and Collis, K.E, (1982). E*valuating the Quality of Learning: The SOLO Taxonomy*. New York: Academic Press.

Black, P. and Wiliam, D. (1998) Assessment and classroom learning, *Assessment in Education* 5(1), pp. 7-74.

Bloom, Benjamin S. (1974). *Taxonomy of educational objectives: Classification of educational goal*s. New York: D. McKay.

Bossu, C., Brown, M., and Bull, D. (2013). *Feasibility protocol: An instrument to assist institutional adoption of OER. National Library of Australia*. Retrieved from http://www.dehub.edu.au/wp-content/uploads/2013/07/Feasibility-Protocol_Report_V2_TD_290513_dehub.pdf

Burgstahler, S. (Ed.). (2013). *Universal design in higher education: Promising practices*. Seattle: DO-IT, University of Washington. Retrieved from http://depts.gpc.edu/cds/Universal%20Design%20in%20Higher%20Education.pdf

Butler, R. (1988) Enhancing and undermining intrinsic motivation: the effects of task-involving and ego-involving evaluation on interest and involvement. *British Journal of Educational Psychology* 58, 1–14.

Chickering, A. W., & Gamson, Z. F. (1987). Seven Principles for Good Practice in Undergraduate Education. *AAHE Bulletin*, 39(7), 3-7.

Feenberg, A., & Friesen, N. (2012). *(Re)Inventing the Internet: Critical case studies*. The Netherlands: Sense Publishers.

Fink, L. Dee, (2005). *Self-Directed Guide to Designing Courses for Significant Learning*. Available at http://www.deefinkandassociates.com/GuidetoCourseDesignAug05.pdf.

Fink, L. Dee (2003). *Creating Significant Learning Experiences*. San Francisco: Jossey Bass.

Germain-Rutherford, A. (2007). "The Alan Blizzard Award: An Award for Collaborative Projects that Improve Student Learning", Society for Teaching and Learning in Higher Education.

Gibbs, G. and Simpson, C. (2004)."Conditions Under Which Assessment Supports Student Learning," *Learning and Teaching in Higher Education* 1, 3-31.

Hattie, J. & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research,* 77(1): 81-112.

Johnston, Nancy and Tina Doyle. (Spr. 2011). "Inclusive Teaching: Perspectives of Students with Disabilities." *Open Words*, 5(1): 53-60.

Kerr, A. (2011). *Teaching and Learning in Large Classes at Ontario Universities: An Exploratory Study.* Toronto: Higher Education Quality Council of Ontario.

Kingyens, R. (2014, March 3). "eCornell Case Studies and Lessons Learned." [Unpublished presentation.] Toronto.

McCahan, S., Bagley, D., Weiss, P., and Woodhouse, K., (2004). "Teaching Design, Synthesis and Communication to First Year Engineering Students at the University of Toronto," *Proceedings of the 2004 American Society for Engineering Education Annual Conference & Exposition*

Macleod, H., & Paterson, J. (2012). "A survey of undergraduate technology use and attitudes, 2011" [Dataset]. University of Edinburgh. Retrieved from http://datashare.is.ed.ac.uk/handle/10283/144

Marshall, S. (2007). *E-Learning maturity model: Process descriptions*. Victoria University of Wellington, Ministry of Education New Zealand.

Merritt, D., Morley, R., Cook, L., Andrew, N., Gurr, G., Jennings, J., … Spafford, H. (2011). *A national curriculum for entomology: Capacity-building through collaborative, web-based delivery.* Retrieved from http://www.olt.gov.au/system/files/resources/CG7_515_Final_Report_Merritt_2011.pdf.

National Center for Academic Transformation (NCAT), (2014). H*ow to Redesign a College Course Using NCAT's Methodolgy*. Available at http://www.thencat.org/Guides/AllDisciplines/How%20to%20Redesign%20A%20College%20Course.pdf

Pugliese, T., Bolton, T., Mogyorody, V., Singleton-Jackson, J., Nelson, R., and Johnson, R.H. (2013). "Peer

Mentoring in a Team-Taught Interdisciplinary Course: Engaging the 21st-Century Student Through Peer-Led Learning." In Tania Smith (Ed.) *Undergraduate Curricular Peer Mentoring Programs*. Lanham, MD: Lexington Books.

Roche, A. (2010). *Blended Learning Initiative Hybrid Course Development Model: Penn State Berks*. Avalable at http://www.bk.psu.edu/Documents/StudentServices/Berks_Hybrid_Course_Development_Model.pdf

SUNY Learning Network, (n.d.) *Online Teaching Survey*. Available at http://sln.suny.edu/teachingsurvey/.

Thompson, J. (2009). "The Alan Blizzard Award: An Award for Collaborative Projects that Improve Student Learning," Society for Teaching and Learning in Higher Education.

Tyler-Smith, K., & Kent, J. (2008). *Participatory action research for myLearn network of provision pilot: Completion of Cycle 1*. Southern Regional Hub Project Fund, Ako Aotearoa. Retrieved from http://akoaotearoa.ac.nz/download/ng/file/group-1133/participatory-action-research-for-mylearn-network-of-provision-pilot-report-from-cycle-1.pdf

Twigg, C. (2003a). "Improving learning and reducing costs: Lessons learned from Round I of the Pew Grant Program in Course Redesign." Center for Academic Transformation, Rensselaer Polytechnic Institute.

Twigg, C. (2003b). "Improving learning and reducing costs: New modules for online learning." *Educase*.

University of Wisconsin Learning Technologies Center, (2005). "Hybrid Faculty Development Program: Ten Hybrid Questions to Consider." Available at http://www.class.uh.edu/classidt/Tutorials_Help/profs/hybrid/HybridReflective10Questions.pdf

Wiggins, G. (1990). "The Case for Authentic Assessment". *Practical Assessment, Research & Evaluation,* 2(2).

Wiggins, G. and McTighe, J. (2006). *Understanding by Design*. Expanded 2nd edition. Upper Saddle River, NJ: Pearson.

Wilson, M., and Wolf, P. (2009). "The New Cartographers: Mapping the Curriculum." Presented to the Society for Teaching and Learning in Higher Education, University of New Brunswick, June 17-20.