BAY VIEW ALLIANCE

RESOURCES FOR ASSESSING STUDENT LEARNING ONLINE

The sudden move to remote classrooms in the spring of 2020—now, for many, extended into the fall and perhaps beyond, poses significant challenges for assessing student learning. Faculty find themselves having to rethink what learning matters most and how to evaluate that learning; issues of equity take on added urgency as students struggle with limited access to technology or find themselves in living situations putting them at a disadvantage; and particularly in fields teaching large classes, issues of academic integrity are on the minds of many faculty. The good news is that these challenges also present opportunities for innovation.

The following materials—a set of design principles and accompanying examples—have been assembled by the Bay View Alliance (BVA), a network of ten research universities working to bring more effective teaching approaches into wider use by sharing what works and pooling resources. Our hope is that the examples will encourage faculty to explore **alternative ways to assess their students' learning**—approaches designed to provide rich information about what students know and can do but that also deepen and extend their learning. The COVID pandemic makes these approaches especially timely but relevant in the face-to-face settings we all hope to return to soon.

For more information, visit www.bayviewalliance.org

DESIGN PRINCIPLES

The following principles represent a synthesis and distillation of guidance to faculty provided by BVA campuses, all of them in keeping with current evidence-based thinking about the ways that assessment can support student learning and success.

- **Clear Objectives**
  The assessment of student work begins with clarity about the goals for the course or program. Teaching in a new (online) context is an opportunity to step back and ask: what learning outcome or outcomes matter most for your students—and (sometimes) which might you "let go"?

- **Conceptual Tasks**
  Especially in large classes, assessments often take the form of multiple-choice exams emphasizing recall. Alternatively, are there questions you can ask, or tasks you can pose requiring more conceptual learning? Might you, for example, ask students to apply what

they've learned in new situations (perhaps including the pandemic itself), interpret data, extrapolate their knowledge in new ways, or assess their own progress? Are there ways to allow students to demonstrate mastery that are more "authentic" to the skills of the discipline than a multiple-choice exam?

- **Equity**
  Online teaching raises and makes visible a host of differences affecting students' ability to learn and succeed: access to technology, living arrangements, time zone, family and educational background, among others. Ensuring all students have equal access to fair assessments, and an equal opportunity to succeed, requires flexibility and adaptability. Designing assignments and assessments to be done asynchronously, for instance, allows students to demonstrate their learning in a setting and at a time of their choosing.

- **Transparency**
  Research on effective assignments and assessment shows that students do better when the purpose of the task is explicit and clear. This means being explicit with students about how the knowledge and skills being asked for can help them—in a professional setting, advanced study, or simply in daily life. It also means being clear about how the work will be evaluated, for instance through a rubric or examples of exemplary performance. Transparency of this nature supports success for all students but especially those who have not always been well served by the educational system.

- **Integrity**
  When assessments present unreasonable challenges, combined with high stakes, students will be tempted to look for ways to beat the odds. But might there be ways to turn this around? What if assessments required collaboration with peers or allowed full access to the textbook? How can assessment be designed to foster a climate of academic integrity?

- **Scaffolding**
  Smaller, more frequent assessments, including formative ones without grades, generate better learning and more valid assessment data than high-stakes tests at the end of a course. Think about restructuring a final exam into smaller subsets of questions, creating a number of mini-exams through the term. Similarly, a large project or paper could be broken up into smaller assignments, starting with a thesis statement or rough abstract, then an outline, then a partial rough draft, and the final product.

- **Feedback**
  Assessment's primary goal should be frequent, timely, and robust feedback aimed at improving future efforts or next drafts. Feedback, including from peers and self, make it more likely students will learn from the assessment process and demonstrate the course learning outcomes, particularly when assessments build on each other within an intentionally-designed structure that anticipates the feedback and the subsequent improvements.

EXAMPLES

The following examples of assessments, assignments, and exams are deliberately diverse in approach, disciplinary context, course size, and level of detail. We invite you to reflect on how they can be mapped onto the design principles—and then to engage in that same process—alone or with colleagues—with your own assessments in view.

Thanks to the faculty members—all from BVA campuses--who have generously agreed to share their practices with assessment, assignments, and exams. We are eager to add to what is here, so if you or a colleague has an example to add, please contact us at hello@bayviewalliance.org

1. Collaborative Book Chapter for Future Students in an Intro Chemistry Course, University of Kansas
2. Learning in Physics Courses Is More Than Just Plugging Things In, Queen's University
3. Online Midterms in both Large and Small Biology Courses, University of British Columbia
4. Empowering Students Through Options in an Intro Undergraduate Course, University of Kansas
5. Making Your Voice Count in a 100-Level Course, University of Kansas
6. Posters and Peer Review on a Wiki for an Upper-Level History Course, University of Kansas
7. Three Examples of Full Course Assessment Plans for Engineering Courses, Canadian Association for Engineering Education

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1. **Collaborative Book Chapter for Future Students in an Intro Chemistry Course**
   Drew Vartia, Chemistry, University of Kansas

   In CHEM 149 online last spring (~35 undergraduate engineering students), I wanted to provide a more formal introduction to materials science. However, ready resources—especially in chemistry texts—don't exist. What an opportunity! In a nutshell, students gradually and semi-collaboratively built these missing resources for future students in the spirit of a non-disposable assignment. Through a series of four writing assignments on particular topics, students gradually built a large repository of quality information that other students could draw on later. Because these supporting assignments were both small and gradual, I had the opportunity to intervene if necessary (*e.g.*, if a student encountered and included misinformation.)

   For the final project, each student built a comprehensive book chapter about a materials class of their choice. While the list of required topics for the book chapter was large, the task was accessible because much of the initial work was done by the class as a whole *via* the smaller assignments. Editing peer work to create single consistent style and significant supplementation with new additional information were also requirements of the final project.

   Several students mentioned wanting to do well on supporting assignments, since their peers might see—or even rely on—their work. The format also satisfied my goal of trying collaboration in an online environment while still honoring student wishes for no assigned groups (mid-semester survey results).

   Nearly all the student projects were of good to high quality. Notably, the assignment generated at least two exceptional and comprehensive book chapters for use by future CHEM 149 and CHEM 150 students. Check here for more details about this project.

2. **Learning in Physics Courses Is More Than Just Plugging Things In**
   Jordan Morelli, Physics & Astronomy, Queen's University

   Students learn best when they have to do something or come up with a solution of their own rather than just plugging things in. In fact in recent years my final exams have all been open book, and I give three or four quizzes during the term, which are all open book. I don't believe rote memorization gets at the skills serving a modern engineer.

   How does learning happen? Assessments and learning are not always the same thing, and giving a three-hour closed-book exam is a crude way to determine how much learning is happening. I can't even be sure the person writing the exam is the person they're supposed to be. So I think we have to move away from those sorts of assessment and start making the experience of the rest of the term more valuable.

3. **Online Midterms in both Large and Small Biology Courses**
   Warren Code, Science Centre, The University of British Columbia

   Click here to see setup options and subsequent experiences from several biology courses and their online midterms run in March 2020. Course examples range from 60 to 500+ students.

4. **Empowering Students Through Options in an Intro Undergraduate Course**
   Meghan Davidson, Speech-Language-Hearing, University of Kansas

   Last spring I taught an introductory language development course with about 40 students. After we switched to remote teaching, I did something I had never done before and gave students several options for completing their cumulative final exam. Students choose between a traditional, cumulative final exam and a mini-cumulative project plus module exam (students were tested only on content from the final module of the course).

   If students chose the second option, they had further choices about the format of their mini-project: a brief workshop for parents, letter to a new parent, or brochure for a pediatrician's office. All options focused on students explaining language development to someone unfamiliar with the content—parents—and were graded on the same criteria.

   I provided options as a way to give students flexibility to work within their capacities at that time, and I thought that most students would choose the second (mini-cumulative project plus module exam). To my surprise, roughly 50% of students completed each option, and students varied in their choice of project format for the second option. Grades were

comparable across the two options. I felt having options helped reduce students' anxiety. I learned that providing options for the final exam empowered students to determine the best method for them to demonstrate their understanding of course content.

5. **Making Your Voice Count in a 100-Level Course**
   Pam Rooks, Sociology, University of Kansas

In SOC 161, Social Problems and American Values, Honors, my students completed a public project. The Coronavirus pandemic highlighted racial disparities in health care, slicing across topics we had planned to explore in the second half of the Spring 2020 semester. It was disappointing to have to move the class online, but the quality of students' input remained high and by the end of the semester, I wanted to find a way to provide a wider audience for their perspectives. Given the stress of the pandemic, though, I also wanted to downsize the final project, which had originally been planned as a large research paper.

This project, *Making your Voice Count*, served both goals by asking students to write an op-ed article as a public sociology piece. They were required to provide six sources to support their argument and were prompted: "Choose a social justice concern and discuss how you think it will be impacted by the COVID-19 pandemic."

The challenge, however, came in finding a way to make a public sociology project truly *public*. It became a group effort that could not have been accomplished without the creative endeavors of Melissa Wittner, the sociology department's administrative assistant, who designed the web page and coordinated student permission forms; Lisa-Marie Wright, assistant teaching professor of sociology, who shared extensive, thoughtful guidance and resources for getting the project underway; and office manager Beth Hoffman, who provided ongoing support. I was also very grateful to the sociology department for letting us post to its website and Facebook page for students to see and share.

The completed collection of student articles can be found here. Click here for the project description and rubric, as well as the student consent form.

6. Posters and Peer Review on a Wiki for an Upper-Level History Course
Megan Greene, History, University of Kansas

As one of a set of scaffolded assignments leading to the production of a research paper, I was going to have a poster day in class. Students were to produce a poster on their research topic describing their topic and discussing materials they would be using to support their argument from three sources. They would also review and comment on the ideas in their peers' posters. The assignment encouraged them to make their posters look nice, but did not require it. At first, when we transitioned online, I thought I might have to give this assignment up, because I was afraid I wouldn't be able to recreate in Blackboard the same sort of easy to use, gallery effect classroom walls would have given me. After a quick consultation with Toshi Urata at CODL, I built a wiki and loaded into it a table with three columns and enough rows for all of the students. I then modified the peer review requirements so each student would review only two posters.

Students uploaded their posters to the wiki and had several days to look over their peers' posters and review them. I had done a poster day once before, in a different class, but I noticed this time I got much more visually stimulating posters. I think by doing this assignment entirely online and without having to worry about printing or sizing posters and the associated costs, many students felt freed up to add more graphics and relevant images to their work.

The course is History 604: Contemporary Greater China. It had 21 students, 19 of whom were undergraduates (mostly advanced, but not necessarily history or EALC majors), and two of whom were non-degree seeking students thinking about going on to do graduate work in history. It was a fairly heavy reading course and I mostly ran it as a discussion class, though given that only a few students had background on China, I had to do a bit of lecturing during the first couple of weeks.

This assignment was designed as a way to give students an opportunity to present their research to the whole class and get a bit of feedback on their ideas from their peers without taking up the amount of class time oral presentations would have required. We could do the whole thing in a single day. It was the final assignment in a set of four assignments (1. topic statement and preliminary bibliography, 2. thesis and outline, 3. 500 word chunk) leading up to the production of a research paper. They got comments from me on all four pre-assignments, but this was the only one for which they got feedback from their peers. For details about this assignment, click here.

7. Three Examples of Full Course Assessment Plans for Engineering Courses

From the Engineering Collaboration for Online and Remote Education (E-CORE), an initiative of the Canadian Association for Engineering Education, to which both Queen's and UBC have been active contributors. These examples were suggested by Brian Frank, Engineering, Queen's University.

Example of a large, scalable technical foundations course		
Context: Core engineering science course, students assessed individually. This example is based on a course taught in the flipped classroom style. The predominant form of assessment is midterms and final exam. Students have weekly homework (for credit). The main assessments in a traditional in-person exam allow four typeset pages of formulae so closed book is not practical for online assessment.		
Assessments	**Purpose***	**Weight**
Weekly preparatory quizzes (12): Weekly auto-graded questions in LMS or via WeBWorK to maintain progress	F, L, M	5
Weekly Homework (12): Weekly assignments using WeBWorK. Each student is assigned different variables for the same problems set. Auto-graded. Collaboration is permitted. Best 10 of 12 scores counted.	F, L, M, E	15
Midterms (2): Long answer calculation-based questions. Unproctored, open resource, work uploaded and manually graded. Questions delivered via LMS quizzing tool. Question banks used to create multiple versions of each question with subtle variations, randomized variables also used (i.e. 2 sources of variation in each question).	F, L, E	40

No-harm post-midterm bonus quizzes (2): Available after each midterm. Long answer calculation-based question, autograded. Unproctored, open resource, time limited. Students upload written work as proof of individual effort but not otherwise graded. If student performs better on this quiz, midterm reduced to 15% of final grade and this quiz worth 5%, otherwise no change.	F, L, M	-
Exam wrappers (2): Survey completion after each midterm to promote student **self-reflection**	F, M	5
Final exam: Long answer calculation-based questions. Unproctored, open resource, time limited, work uploaded and manually graded. Questions delivered via LMS quizzing tool. Question banks used to create multiple versions of each question with subtle variations, randomized variables also used (i.e. 2 sources of variation in each question).	L, E	35
*Purpose: **F**eedback, **L**earning, **E**valuation, **M**otivation		

Example of a large, scalable design/professional practice course
Context: Students assigned to teams with one student assigned a particular technical sub-system role. Bi-weekly **written response** is set in the context of that role. Team reports include an individual section from each student about their sub-system, along with a reflection on individual and team performance. Some written work undergoes **peer editing** using AROPA. ITPMetrics is used for regular peer evaluation of teaming performance. A student's final grade can be adjusted if information from peer evaluation and TA observations of the team suggest the student is making an exceptionally high or low contribution to the team effort and deliverables. Flexible grading to handle accommodations and illnesses.

Assessments	Purpose*	Weight
Auto-graded questions: Weekly auto-graded randomized scenario-based questions in LMS (10), best 8 of 10	F, L, M	10
Written response: Bi-weekly short written response to a topic in project context relevant to individual role, and **reflection** on comparing the previous written submission to an exemplar response posted afterwards (6). Lowest score dropped.	F, L, M	20
Team report: Proposal report (team and individual sections),with individual and group **self-reflection**	F, L, M, E	20
Team report: Final report (team and individual sections),with individual and **self-reflection**	L, E	25
Peer feedback: Quality of **peer feedback** provided to other students	L, M	5
Team peer evaluation: Completion grade for **peer evaluation** (2)	M	3
Completion grade for filling in course survey (2)	F, M	2
Unproctored team exam: As a team, respond to a design scenario, demonstrating knowledge of processes and tools. Individual students take on specific roles.	L, E	15
*Purpose: **F**eedback, **L**earning, **E**valuation, **M**otivation		

Example of a fully online large scalable professional skills (economics) foundations course
Context: Students assessed primarily individually.

Assessments	Purpose*	Weight
Quiz per module (17 quizzes): Auto-graded questions in LMS, drawn from a large pool, randomized. 1% each.	F, L, M	17
Individual Assignments (3): 5% each, one a very open ended scenario (business case/entrepreneurship).	F, L, M, E	15
Midterms (2): Unproctored, open resource, done in LMS and with work uploaded. Multiple versions of each question with subtle variations (a pool of scenario-based questions that differ by the scenario, order of sentence, and parameterized variables, though similar solution process for all of them). Numeric answers are submitted in LMS and rough work is uploaded; TAs review rough work when numeric answer is not correct.	F, L, E	20
Final exam: Long answer calculation-based questions similar to midterms.	L, E	35
*Purpose: **F**eedback, **L**earning, **E**valuation, **M**otivation		

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CURATED RESOURCES FROM BVA CAMPUSES FOR ASSESSING STUDENT LEARNING ONLINE

Indiana University Bloomington
Suggestions for designing learning assessments providing feedback about what students are learning, including informal, non–graded strategies—relevant both to online and F2F contexts.

Information on Handling Exams When Your Course Unexpectedly Moves Online.

Queen's University
A guidebook developed in Health Sciences—but broadly relevant across disciplines and fields—on effective feedback.

The Quick Guide to Remote Instruction was developed by the Canadian Engineering Education Association (suggested by Brian Frank at Queen's) and includes several useful elements. Both Queen's and UBC contributed to the guide.

University of British Columbia
Science guide to developing and deploying online exams offers ideas and processes for replacing a traditional, in-person, paper-based exam with an alternative students can undertake remotely.

Remote Assessment Guidebook with summary of fundamentals, tools and strategies, and a section on academic integrity. For more on academic integrity, see also this UBC resource recommending faculty adopt "pedagogies of integrity" in their courses and shift the focus from academic misconduct to academic integrity.

University of California Los Angeles
Recommendations for remote assessment from the Faculty Senate, and a table featuring alternative approaches.

University of Colorado Boulder
Applying mastery-based course design to allow for flexibility and reduce cheating in remote teaching settings.

University of Kansas
Entry point to step-by-step guidance for flexible teaching, including attention to learning goals and re-envisioning opportunities for students to demonstrate their learning.

A diverse set of examples of alternative assessment from the Center for Teaching Excellence E-Newsletter (some of which are featured in the "examples" section of these materials.)

University of Massachusetts
Guidance to faculty on how to support students in maintaining academic integrity.
Note that UMass emphasizes the academic integrity issues as foundational in assessment design. The link also references additional resources on exam design.

Forward Focus: Feedback on Course Understanding and Skills - an end-of-course survey developed by the UMass Center for Teaching and Learning; includes a chart showing how Forward Focus relates to the Student Response to Instruction (out of the Office of Academic Planning and Assessment).

University of North Carolina at Chapel Hill
FAQs for faculty designing assignments and assessments for online settings; walks faculty through a number of design questions, highlighting different types of and tools for assessment

Information about remote teaching more generally but also sections on Inclusive Teaching and Outcomes and Assessment.

University of Saskatchewan
Guidance on the design of final assessments, including a discussion-prompting graphic that maps assessment options against student Internet access and resources needed to administer.

Guide on good practice strategies for adapting assessment for remote teaching; can be downloaded and printed.

University of South Florida
Concise guidance for designing policies and practices preventing academic misconduct in online settings and beyond.

Definition and examples of making assessments "authentic" in both online and F2F contexts so assessment actually measures the desired skills themselves instead of approximations (like tests do).