Some of the ideas discussed in the session *Teaching and coordinating a lab or tutorial course with less of everything!* at *Let’s Talk About Teaching*, 31 August 2012.

**Class time**

**Labs/Reduce marking time**
Filling in the blank can be a mindless exercise in reporting an experiment. However, marking a report written in a prescribed format can speed up the process. Choose tables to which you can apply a template that does not take away the critical decision process. This need not be for every experiment or every table, and the amount of content can be varied accordingly.

*Advantages:*
- having each report appearing in a similar format may make it quicker to mark that section;
- material that will only be copied from the web anyway (e.g., MSDS, safety, physical properties could be already completed. This can save time for both the marker and the student.

*Disadvantage:*
- sometimes, it is important for the learner to decide how to create a data table and which data to include;
- pre-formatting may make it easier to copy from one to another.

**Labs/Reduce marking time**
To reduce marking time for the lab TAs, students self-mark from provided answer keys. Assessment for the course will be done through a series of lab exams.

*Advantages:*
- it will increase engagement in learning by reviewing their lab work actively after each lab, thus reinforcing concepts and ideas;
- circumventing the problem of students ignoring the TA’s feedback;
- removing the mark-per-experiment will facilitate more student learning in the lab rather than worrying about just reaching the correct final answer.

*More info:* Eileen Van der Flier-Keller, fkeller@uvic.ca

**Labs & Tutorials/Reduce marking time**
Does all class work have to be marked? Does all work have to be in the same format or can some if be in a shortened format?
Variations on this could be that calculations are marked on a multiple-choice bubble sheet format or focus questions are used to assess the key points of the lesson plan.

*Advantages:*
- shorter formats may take less time to mark

*Disadvantages:*
- less rigour may reduce the effectiveness of learning a protocol or format;
- there is a cost attached to the use of bubble sheets.

**Labs/Reduce marking time**
The course coordinator creates an Excel file into which the students can write their data at the end of the lab class. This data can then be pasted into the first page of an extended file which has all the calculations formulated based on links to this first page.

*Advantages:*
- calculations that are known to have generated the correct answer are much quicker to mark;
if the class shares data, this is an easy way to transmit it to everyone as an email attachment.  

Disadvantages:  
the extended file must not fall into the wrong hands!  

More info: Dave Berry, berryde@uvic.ca

**Labs/Reduce supplies cost and marking time**

Use multi-week experiments on the same root topic. For instance, this might be to study the same sample using different techniques.

*Advantages:*  
supplies may be reduced for samples to be studied;  
less reports to be written (and marked) if combined into one report - or smaller ones written each week.  

*Disadvantages:*  
this might lead to less exposure to different topics/samples/analytes;  
logistical problems if a student is away one week;  
this requires planning before the course material is finalized.

**TA staffing**

One of the common ways to reduce the number of TAs per course is to require the students to work in pairs. In order to emphasize who is responsible for a part of the experiment and report, one student can write up the data and results while the other writes a discussion of the data and the consequences of the conclusions

*Advantages:*  
there is a dramatic change to the budget by doubling the number of students per TA;  
the typical problem of one disengaged partner is overcome by giving them different responsibilities - which can be rotated the following experiment.  

*Disadvantages:*  
working in pairs can quickly reduce the level of engagement in the class. Another option is to consider alternating weeks;  
this requires planning before registration takes place.

**TA staffing/tutorials & problem sessions**

The traditional (science/engineering) lecture is often supplemented with small group problem sessions or tutorials. Although conceived for different reasons, ‘flipping the lecture’ might alleviate the pressure on a TA budget. Conceptually, this is where the lecture notes/readings are expected to be done outside classtime and any class meetings are reserved for problem sessions or discussions only.

*Advantages:*  
where tutorial support might be cancelled, problem sessions can still be held effectively, with small groups created within a lecture class of up to ~ 50, such as might be typical for a summer course.  

*Disadvantages:*  
this may be a dramatic change from past practice;  
requires planning well before the course starts.

Variations on this include running problem sessions occasionally instead of lectures, using volunteer learning assistants from the previous cohort of this class.
Departmental strategies

Staffing
What is the ideal ratio of students: instructor? Can a larger ratio be supported if there are two instructors? Can the rooms take the larger number of students?

Advantages:
the student: teacher ratio can have a big effect on TA salary budget

Disadvantages:
being able to book a suitable room can be a challenge;
marking can become too heavy if the student:TA ratio is increased;
this requires planning before registration takes place.

Staffing duties
Is it cost effective for every TA to hold office hours? If duties can be redistributed, it may be more effective to staff a help centre with someone dedicated to answering questions.

Advantages:
expertise is developed by the help centre TA;
one location with variable times increases accessibility for the student;
instructors can also hold office hours in the help centre.

Disadvantages:
less personal contact/instructional time between TA and student;
the best choice of help centre employee limits it to TAs with experience in this area;
this requires planning before the start of term.

Quiz/test/exam marking
Require the marking guide to be submitted with a preview of the exam to the chair for approval before the exam period. Mark as a team with the instructor present, to solve problems on the fly.

Advantages:
simultaneous marking by the team will help to keep hours under control;
the presence of the instructor will minimize the number of scripts that need to be revisited;
marking in one location will aid security/prevent loss;
ensuring a marking guide is in place before the exam will reduce the amount of time wasted immediately prior to the marking process beginning.

Disadvantages:
requiring all markers to be present in one location may introduce logistical difficulties;

Quiz/test/exam marking
Write questions (where feasible) that are going to require answers in an easy format to mark. Such examples could be short answer/mix & match/complete diagrams... Is it more effective (pedagogically, financially) to set 5 shorter quizzes than two midterms?

Advantages:
Less money spent on work that provides relatively little feedback to the student (especially finals).

Disadvantages:
Lowering the amount of writing is probably not the best direction to aim for engagement and processing material
**TA staffing/invigilation**
In order to meet all the academic needs on a reduced budget, some jobs that may have been supplemented by TA support could be opened up to volunteer/required contribution from all the faculty/academic staff. Team marking has been suggested, but perhaps an easier option to implement is the supplemental invigilation of midterms, quizzes and exams.

*Advantages:*
- adequate invigilation may disappear without some voluntary contribution

*Disadvantages:*
- could be construed as taking away a unionized task;
- difficult to organize/coordinate.

**Instructor staffing/labs & tutorials**
Rather than relying on a combination of lectures and labs/tutorials, can the course be effectively taught by labs or tutorials alone, or with a greatly reduced number of lectures?

*Advantages:*
- reduction in lecturer time lowers the cost of running a course significantly

*Disadvantages:*
- very strong coordination of multi-sections is needed to keep opportunities equal for all students;
- requires departmental support well before term starts.

**Some thoughts and suggestions from our discussions**
What can new technology offer to replace the loss in staffing?
Some examples were discussed:
- running a blog for answering questions (instead of f2f time);
- automated responses from commercial problem-setting software (eg Mastering Chemistry);
- using software for grading (eg Mechanix from Texas A&M for grading diagrams).

There is a need for university (LTC?) support for seminars & workshops on the effective use of technology with the specific focus of saving staff time.

Note added after the meeting: There was a recent article on ‘60 Minutes’ that might be of great interest related to online learning and flipping the lecture. Here's a link [http://www.cbsnews.com/8301-18560_162-57503560/khan-academy-the-future-of-education/?tag=contentMain;cbsCarousel](http://www.cbsnews.com/8301-18560_162-57503560/khan-academy-the-future-of-education/?tag=contentMain;cbsCarousel). The Khan Academy website is found at [http://www.khanacademy.org](http://www.khanacademy.org). Could this be a bridge to a partnership that the LTC could mediate?

Similarly, help in designing high quality collaborative assignments (again with a focus in the reduction of assessment costs) might be valuable.

It is likely that additional support will be needed to help those working under threat of imminent lay-off.