Challenges and Solutions to Implementing IBL

Challenges

Towards the end of the second day, Dana and TJ had the participants form into groups of 3-4. The task of each group was to generate a list of the top 3 challenges to implementing IBL. Below is a summary of the list of challenges that was generated as a collective. The list is roughly ranked according to the number of votes each challenge received.

- **Class size**
- **Academic buy-in**
- **Physical space**
- **Student buy-in**
- Encouraging shy students
- IT infrastructure
- Resources
- **Fostering safe environment**
- **Content pressure**
- Teaching evaluations
- **Uniformity and consistency**
- **Designing activities**
- Starting off on the correct foot
- Workload for faculty
- Prep time

Solutions

Following the discussion of challenges, groups were reshuffled and charged with discussing potential solutions to a single challenge. The challenges in **bold** above were distributed to the small groups. Below is a snapshot of solutions that each group discussed. *Note:* I (Dana) have done my best to transcribe the notes I received.

Class size

- Interactive learning via clickers, peer instruction
- Structured out-of-class activities
- Flipped learning
    - Low-level stuff pre-class
    - Higher-level discussions in class, mostly lecturer led due to class size
    - Flipped learning is less dependent on class-size

- In case students don't engage:
    - Allow awkward/uncomfortable class when students haven't prepared
    - Avoid reinforcing bad behavior

- Reduce class size?
- Choice of rooms
- Training?
- Present to one another, jigsaw
- Have some randomly selected students present
- Tickables assigned to groups, not individuals (maybe for presentation, maybe for more)
- Have students evaluate the writing of each other (so they are still judging math)
- Maybe video presentations evaluated (outside of class) by subsets of peers (posted on secure site)
- Reduce class size by running it twice (requires extra resources)
- Divide class into groups, each with their own tutor, so no large class! (requires extra resources)
- Have extra tutors in the lecture room to help when students are working on problems (requires extra resources)

- Video link to smaller rooms, each with a tutor

Academic buy-in

- Key question: what sort of support are you seeking?
- Invite colleagues
- Tell people in advance
- Try to encourage people to discover
- Invited speakers
- Watch elsewhere
- Published resources
- Safe trial with non-core content
- Start with modules taught by "converts"
- Eventually need a strategic approach, to align with the educational development goals of the scheme
- Skeptical staff can be won over by seeing the improvements in students as they progress through
- Implement flipped/PI in the first year across the board; then might reduce the need for such approaches in later years
- Workload considerations are *important*: support for staff required

Physical space

I (Dana) don't seem to have notes from this group

Student buy-in

- Talk to 'em
- Cheerleading
- Humour
- Justification of skills, showing them what they'll get out
- Getting a student from previous year to talk about it.
    - peer - justification
    - peer - sharing

- Champions with the student group

Fostering safe environment

- Establish ground rules
    - Critique maths not individuals
    - Respectful questions
    - Critique should take form of a question (Socrative)
    - Include an opt-out for presenter (maybe ask them to explain why they're opting out)
- Early success to build confidence
- Early fail opportunity to establish permission to fail and use as opportunity to explain how to improve
- Perhaps link early fail exercise to something they will be able to do by end of module
- Obvious instructor presence and appropriate intervention, especially in early weeks to establish supportive environment but not so stifling to restrict space to learn
- Room should be appropriate, open enough to allow movement from workspace to presenter space
- Instructor should adopt informal presence to facilitate learning not dictate it

Content pressure

- Prune. Get content done to a nice linearly independent set
- Stop at some point and change method
- Thinking about flipping

Uniformity and consistency

- Does consistency matter?
- Even with traditional teaching, different students and different tutors will have different experience
- Training
- Managing student and staff expectations re: consistency
- Continuity across groups
    - Training essential
    - Team meetings

Designing activities

- There is a difference between choosing individual problems and the overall design.
- Even if you steal your problems from somewhere else there is an overall "design".
- Sense of progressions through the material. Coherence in the problems.
- What about problems for students with different needs?