A village approach to forming future researchers

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Introduction:

Traditionally, researchers are formed through a mentorship system.
Fruitful when the chemistry is good.

We will argue that a larger and more diversified environment is far more appropriate, in particular for cégep students.

The village :

- 20-35 students
- Researchers of varied level and type of expertise
- University labs and Dawson ALC
- Each member participates in the formation of the new researchers
- Mix of peer and expert education
- Mix of interests and skills
- More structured than typical communities of practice as it lasts only a summer
- Flexibility to accommodate a diversity of needs and constraints

We applied this approach very successfully in the summer 2015 and 2016 and are starting our 3rd year:

Summer Brain Imaging Internships

Goal:
Introducting cégep students to *research*

Setting of 2016 internship

24 Dawson students

Mainly science students, also diagnostic imaging

Few mature researchers

- Voluntary basis: no money, no credits
- Two 2-hour meetings a week
- 10-25 hours per week in the lab for 7-8 weeks

Brain Imaging:

- Multidisciplinary
- Highly appealing to our students
- Very active domain of research in Montreal

How it worked

- In June, each student researched a topic (chosen by the coordinator) and presented it to the group. Resource people fostered discussion among students.
- In July and August, students worked in teams of 2 or 3 on research projects under the supervision of experienced researchers. We had group meetings twice a week and written updates.
- The summer concluded with a summary oral presentation by all the participants and a week-long poster session for the Dawson community.

Collaborative framework, similar to PBL

student-centered
collaborative
experiential
authentic open-ended problems
instructional goals are:

- to encourage investigative and problem-solving skills,
- to provide experiences with adult roles,
- to promote confidence in ability to think,
- to become self-regulated learners.

Challenges facing new researchers

- Unknown territory. No textbook, no recipe, no quick answer.
- How do you get the information you need in the jungle?
- How do you become proactive if you are used to follow directives?
- Realistic expectations regarding daily activities: progress is slow, solving one bug after another.
- No guaranty it is going to work.
- How do you find your own voice? How can you tell if you are going at it the right way?

How the village helps overcoming these hurdles

- The uncomfortable situation of moving in unchartered territory is eased when shared with peers in a similar situation.
- Personal initiatives are encouraged and the network provides a safety net.
- Students learn to learn together.
- Peer stimulation and commiseration.
- A lot of constructive feedback from the group.
- Each one belongs and is recognized as a full member.
- Frequent reassurances.

How the village helps overcoming these hurdles

- Guidance from experienced researchers : on the theory, the technical aspects but also on how to acquire the skills, how to deal with the frustration, etc
- Resources persons rarely lead, occasionally clarify difficult points, and mainly contribute different styles of thinking.
- More traditional mentoring also takes place on sites, during the specific projects.

Other village aspects

- Students learned research methods as needed, in a real problem-based setting. Group work makes it easier to cover more ground.
- Multiple strengths are brought together.
- Because of the diversity of the group, it is very likely that everyone will find someone they can converse with productively.
- Many of our students will have a career in a multidisciplinary team where they will have to interact with people of varied background. Learning how to do it well and learning it now is a must.

Results

- Substantial improvement in communication skills and self-confidence:
  very impressive *oral* and *poster* presentations at the end of the internship.
- Learned a lot about research.
- Learned quite a bit about Brain Imaging in general and their own topic in particular;
- Connected the big picture to the day to day tasks.

Outreach

- Poster session:
  first week of class and Open House.
- Presentation to the Minister of Higher Education in September.
- Ped Day workshop.
- Visits to psychology classes in October.
- First Choice seminar in February.
- Science Fest in late April.
- Poster at ACFAS in May.
- Publications in Dr.Jes and The Plant.

Future

- Include students and faculty from different programs.
- Integrate Neuropsychology and Programming.
- Adapt to new needs.