Mentoring Undergraduates
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Let's Talk About Teaching 2013

Abstract
Mentoring students is something that touches every aspect of what we do as instructors. The intent of this session is to have a discussion about working with undergraduate students on research projects not related to any course (much of the discussion could be relevant to course-mandated research as well). The topics to be discussed include:

1. How are the students selected?
2. How is the project selected?
3. What is the desired outcome and what is the assurance the project is at the right level?
4. What constitute good practices for working with the student(s) through the life cycle of the project?
5. What determines whether the project was a success?

It is intended that the discussion be subject independent, and not focused on projects in math, science or engineering. To accomplish that goal, lots of people will need to contribute ideas.

1. Just what exactly is “mentoring”?

All I can contribute to this discussion is the perspective of someone who has worked with many undergraduate researchers over the past 24 years. Every situation is different from the others in some way. For that reason, there is no instruction set. There is a collection of ideas that fit together in various different ways depending on the situation at hand. The whole seems greater than the sum of its individual parts. It isn't possible to promise that any of the suggestions will work for you. Finding strategies for success that work with your outlook and personality is part of the challenge. Hopefully, through this workshop you will have some of your ideas reinforced, been exposed to some new ideas, and be led to try new things.

Various dictionaries define a mentor as

• a wise and trusted guide and advisor
• an experienced person in a company or educational institution who trains and counsels new employees or students

That definition may not be entirely satisfying. From it we can infer that, maybe, mentoring is a helping relationship that involves trust, and offering experienced guidance to assist someone in achieving a goal.

One online thesaurus lists coach among the synonyms for mentor. The main difference in the Oxford Dictionary definition of the two terms seems to arise from the view that coaching is something that most often occurs in the context of sports. With all due respect to that point of view, I think that coaching is something that can occur in any context. While a coach's leadership can be directive or gentle, or anywhere in between, I think mentoring is almost always gentle. The point of view that
mentoring is gentle coaching leads to this possible definition:

A mentor is a knowledgeable partner who helps someone develop in a role through
  • building a respectful relationship
  • helping to identify short and long term goals, and ways to make progress
  • improving awareness of what may arise
  • working towards independence

Let’s run with this one (unless you can improve it!) and see where it leads.

With apologies to Charles Barkley, I suggest that people in positions that carry power and authority are role models, even if they don’t want to be. Even in class, students learn a lot more from us that just the technical details of the subject at hand. That’s especially true when working with students individually or in small groups. Through actions (more than words) we communicate to students
  • how to be a professional
  • how to manage many demands and pressures
  • how to systematically approach your work
  • how to work with others

These may not be the things that you set out to mentor a student in, but I suggest that it is worth recognizing that you are actually doing so (whether you like it or not). I’m not suggesting that any person needs to change what he does; I am suggesting to be aware of what you’re doing. Part of a student's university education is being exposed to the different approaches taken by many highly intelligent people. Something can be extracted from every experience.

2. Some issues to think about

(1) How are the students selected? How do you come to work with them?

My experience is:
  • Sometimes students approach you because they have a particular focus on which you're regarded as an expert, or because they are interested by your area of expertise (as they understand it) and see you as friendly.
  • Sometimes you recruit the students. (In my case, to give students an opportunity and maybe also as a way to communicate to students that they have some real talent in the subject.)

Working together is a matter of mutual agreement. It depends on whether there is enough in the intersection of our interests, and also whether it is possible to work together as people. Over time there have been students who I have felt would be better off working with someone else. I have tried to facilitate that.

(2) How is the project selected? (What are the learning outcomes?)

For me, it begins with talking to the student. Students who have approached me often have a particular sort of topic in mind. Quite often the task is to help narrow the focus from some grand goal to a narrow corner of the area that the student has a chance to make their own. Sometimes it is better to try to shift to a related question. For students I have recruited, usually I ask what courses they liked best and what is was they most liked about then. For either group of students, my goal is to suggest about three
somewhat different projects, provide some reading material on each, and then about a week later talk about what they think and which they prefer.

What are the learning outcomes? (That is, what do you think they are?)

(3) What assures that the project is feasible, and that progress can be made?

For me, determining feasibility depends on two things: (i) having a good idea of what the student can do (how would one know this?); (ii) having a good idea of how what is involved in the project and how to do it. The first one comes from talking to the student, from maybe having taught them or talking to someone who has, and maybe from looking at their transcript. The second one is a product of experience in the subject. An experienced researcher who had difficulty working with students once told me that if they knew how to do something, they would do it themselves (that is, they would not share the experience with a student). I take the exact opposite point of view. If I have something that's feasible for a student to do, I would rather share the experience. No one needs to know if I know how to do it beforehand. The point is to lead the student to the discovery.

(4) What are some good practices for working together?

• Regular meetings (weekly). Show up on time and finish on time. Remember that students are under a lot of different pressures. Sometimes it is best to suggest a week off.
• Be aware of different approaches you could try, and try them if what you're doing isn't working. Every student is different. Try to find a way to work with what is helpful for them. Don't assume they are like you (were).
• Through your actions, illustrate the “right” way to do “things”.
• Show your excitement and enthusiasm.
• Direct students towards their individual interests and strengths. Help structure the project so the student has a chance to be successful.
• Try to create a supportive, accepting atmosphere in which the student looks forward to meeting with you.
• Set goals, benchmarks, timetables and deliverables. Regularly review progress. Keep things on track.
• Try to start with what the student has done and build from there, rather than being directive. Try to find positives in their work. Applaud any sincere effort; comment on improvements.
• Show an interest in students and their lives. Talk about more than just the academic work, provided they are willing. Watch for signs of troubles, and gently ask what's going on if any are seen.
• Remember that credibility, trust and respect are highly fragile.

(5) Is it research?

I say yes. In my experience it has quite often happened that undergraduate students have done something brand new, and have achieved a publication in a respected, mainstream, peer-reviewed research journal. In these cases there is no doubt it is research. But even if the student is not doing something new to the world, they are doing something new to them as a product of their own creativity and other means. Isn't that research?
Additional Resources


McGill University Mentoring website, http://www.mcgill.ca/mentoring