

## **Guest Editorial – Vicki Remenda**

### **A journey to enquiry learning**

By way of introducing this volume, and its six papers that explore varying ways of approaching enquiry learning, I wanted to write first about my journey to enquiry learning. My reason for this format is I want to show you the reader that my coming to this critical mode of pedagogy was through my own enquiry and process of discovery.

### **Struggling with my teaching**

After the first two years or so of my university career, I began struggling with my teaching. I don't mean struggling to put together a cogent lecture or a reasonable assignment, but struggling with the way in which I thought about and approached teaching. I was dissatisfied with the whole thing. I wanted my teaching to be thrilling, wanted it to ignite questions in my students, wanted them to seek answers for themselves, wanted my students to learn deeply and me to learn from them. But here was the problem: the responsibilities of student and professor were meted out in the familiar way of the university. I decided what was important to be learned at the undergraduate level, I lectured, I asked. I was the authority. My students attended, dutifully wrote down my words, handed-in assignments, and passed their exams. I came to the rather startling realization that I was not achieving what I had imagined I could do with my teaching because the focus of my teaching was me. I wasn't letting my students ask their questions, and I wasn't focusing on or supporting their learning. So now what?

### **On the way to enquiry learning**

I enrolled in numerous workshops at the Queen's Instructional Development Centre (now the Centre for Teaching and Learning); I begged time with educational developer friend and mentor, Susan Wilcox. (She was very indulgent of my phone calls interrupting her with yet another "I had this idea..."). I tried team learning, active learning, learning tasks, and think-pair-share. Some of these techniques proved to be successful, some less so, some were outright failures but fortunately even the failures provided information. My teaching reviews suffered as my students suffered through my experiments. I was not doing what was expected of a university professor and this was troubling for some students. Though a good number of my students were appreciative of my different approach, many were resistant. Certainly students who wanted an authoritarian at the front of the classroom were disappointed.

There was, however, some exciting learning happening as well. I began using learning tasks in my lectures – that is, I asked students to do something right away with the lecture or reading I provided (Vella, 2000). This was their invitation to ask meaningful questions. With the help of some very forward-thinking students I developed a prototype course where only the process and general content area were specified. When the seven of us pioneered this process course, it did achieve what I had been hoping for: they took responsibility for their learning, and I learned right along with them.

In addition, I developed a series of activities that helped engage students in the literature of my scientific discipline, hydrogeology. I maintain that even at the third year level, students should be able to read, review, write about, and discuss a scientific paper. By engaging with the literature, students learn the disciplinary approach of a hydrogeologist, that is, how hydrogeologists go about their work. At the time of writing this editorial, my students have just finished another round of open-ended, themed discussion groups about the papers they had chosen. (In the final course activity, they choose their own paper, provide a review, and participate in discussion group.) Now students tell me that they learn a lot through this activity, although when I first introduced it, students were not comfortable and did not feel successful. I believe they are successful now because the course is organized so that they have already successfully completed two earlier assignments that involve reading and extracting information from papers that I assigned. I have learned through experience that a level of training, although I hesitate to use that word, is necessary to help students. If I simply throw large open-ended problems at them, without helping them first develop the requisite skills, there is too much uncertainty for them to engage productively in the activity.

I have also learned, through these explorations with alternative methods, that students need a supportive environment when they are taking what they perceive to be risks with their learning. This is consistent with Atherton's (2005) model of overcoming resistance to new kinds of learning, and so I set about creating as safe an environment as possible. I was making my way to a new way of thinking about teaching and learning. I was acquiring new ways of helping students learn. And then I discovered that this way of thinking and learning has a name. It is enquiry learning.

### **Conditions for Enquiry Learning**

I want to articulate what I feel are the elements of successful, fully autonomous enquiry. These elements or conditions are that: 1. the learner poses the question, and thus enquiry learning is autonomous, although it may be supported at a level appropriate to the learner; 2. it requires that learners assemble, filter and reflect on information, that is, they acquire critical thinking skills that enable these processes; 3. the learner creates a product through enquiry and reflects on and revises that product; and 4. the product is disseminated to a wider audience. These conditions are not different from what others have written. However, I would emphasise that, in order for students to be successful at enquiry and for the university instructor to be successful at implementing enquiry based learning in their courses, there must be an element of training. What I mean by training is that we need to help students acquire the skills of enquiry in a supportive, lower risk environment. Students who have learned to be successful in the more traditional approach to university learning, despite admitting some boredom with that approach, are often resistant to new approaches because they fear failure. This may explain why Duncan and Lyons (this issue) experienced more resistance from upper year students. Those students had already learned the skills for "surviving" university and were uncomfortable with a new, untried way of learning. Thus, the conditions for success for both student and instructor must include a safe environment in which to learn. That is, if students are uncomfortable intellectually they need to have some extra emotional support, the mindful development of the skills necessary for enquiry and precise and written instructions for activities that gradually increase in complexity and in independent learning.

I now use a series of what I call inquiry-based learning activities (inelegantly called IBLA's) to help students work towards open-ended autonomous enquiry. They illustrate the increasing complexity of the task and articulate what is expected of both student and instructor. The Research Skills Development Framework developed by Willison & O'Reagan (2007) similarly outlines the behaviours of students engaged in enquiry. The framework is illustrated by a matrix with five levels of student autonomy ranging from research at the level of closed enquiry with a high degree of guidance to self-directed and open-ended enquiry, against six facets of enquiry from beginning to mature enquiry where students understand both what they need to know and how to achieve that knowing.

### **My reflections on enquiry learning**

Enquiry learning is open-ended, that is, the answers are not known a priori. Because of this, enquiry learning is an excellent preparation for students who wish to enter graduate school. It is ironic to me that we usually gauge the suitability of an undergraduate student for graduate work on the basis of marks achieved in a system that, for the most part, promotes rote learning and the ability to solve routine, closed problems.

Although information is no longer difficult to obtain, compared to when I was an undergraduate and my professors and textbooks were the knowledge gatekeepers, the problem facing students is deciding what information is important or reliable. Rather than cautioning students about the web, we need to help students develop the skills to grapple with it. We have to provide them with opportunities to think independently. While this may seem like a perfectly obvious statement, if I reflect on my undergraduate education, I know that in fact I had very few opportunities to think critically and independently, and in my early days of teaching, I was doing exactly what my professors had done. Therefore, I would argue that along with helping our students to obtain the skills and knowledge of their chosen discipline, we should also be helping them to make decisions about critical information, and what are the ways in which this knowledge should be applied, and how and why and if a problem is to be solved.

It is clear from my experiences and the experiences of the authors of the papers with this volume: if students are to achieve Level V of autonomy where they engage in "open enquiry within self-determined guidelines" (Willison & O'Reagan, 2007), then opportunities to engage in enquiry must be embedded throughout the curricula and not just introduced as a capstone experience. Students then develop skills for and comfort with this type of learning, and as a result experience the motivation, potential transformation, and life-long learning that are often cited as reasons for enquiry.

What does this mean for an individual instructor's practice? It means sharing control of the learning with students. It means supporting and trusting them in their learning. (Implicit in much of my writing is that not only do students have to trust us, we have to trust them. I once overheard a professor say, "...if I give them a lecture I know what they've learned". To me this implied that the professor did not trust students to think for themselves. We have to trust students to take responsibility for their own learning, and trust that they can make decisions about critical material.) It means being prepared for one's own discomfort. It means mindful integration of enquiry within courses and across courses. It also means that opportunities for faculty to learn and discuss ways of implementing enquiry learning are critical. Ideally these opportunities would be

facilitated by educational developers who can help us through our own stumbling blocks, help us devise strategies that overcome the resistance to new ways of learning that we may encounter from both students and colleagues and of course provide that safe environment for us just as we attempt to provide that safe environment for our students.

Palmer (2007) talks about the value of ethical autonomy, that is, not just having knowledge and skills, but knowing how and when to apply one's skills and knowledge, and asking of oneself, "is there a different or better way to do 'this'?. He argues that when we allow students to be passive in our classrooms, our message is that we value passivity. If we inculcate our students into such a culture, why then are we surprised when these same people are passive citizens? Perhaps the most compelling argument for enquiry learning is that it counteracts this passivity.

### **This volume**

In this issue there are six papers that illustrate varying facets of enquiry-based learning. The first paper by Pritchard et al., is a novel project that seeks to create enquiry-based learning activities in many different disciplines across a university, in response to the university's mission. This exciting project pairs students and teachers in the process of creating these modules, and it is a process to emulate. The resulting modules illustrate that enquiry based learning encompasses a wide range of activities from business cases to laboratory topics to tasks to support learning about the role of the media in shaping the religious imagination.

Stafford models enquiry learning in a cognitive neuroscience course for M.Sc. students by posing four open-ended questions to be considered and then providing resources and opportunities for students to answer those questions. The challenges that were encountered are similar to those above: learning to trust students so that they can be autonomous, finding the right mix of structure and independence, and of course struggling with the idea of learning as "filling up a vessel" rather than "lighting a fire".

Duncan and Lyons write about their experiences with introducing enquiry based learning into an exercise biomechanics course. Through the focus groups used to investigate students's experience Duncan and Lyons found that students felt that enquiry based learning had been important for skills development. However, second year students were more likely to have struggled with this new mode of learning, especially those who equated success with knowing what to instructors wanted to "hear". First year students were more open to new experiences which argues in favour of ensuring that enquiry is introduced early and appears frequently within a curriculum.

Chow and Tang illustrated that enquiry based learning can be especially meaningful in a molecular genetics laboratory. With guidance, and working on a well-known model organism, second year students developed their own hypotheses and developed experiments to test those hypotheses. Students reported feeling empowered by the freedom to enquire on their own and as part of a group, which provided additional support for their learning. The pilot was considered to be very successful and has led to a greater interest in increasing opportunities for enquiry learning within the Hong Kong system of higher education.

Backx uses a case study approach in a sports and exercise science module with the goal of promoting autonomous learning. Backx's definition of autonomous learning "...to be the skills that students developed to evaluate their own performance through reflection and self-appraisal, as well as the ability to work independently using effective time management and planning skills" is particularly appealing as it is a clear statement of what we expect from our students when they engage in enquiry learning, or in this case learning from case studies. Overall the goals of the case study were met, as shown by use of a questionnaire that asked about both transferable skills and working in groups, and was administered to students who had been taught in the traditional lecture mode in year one and the case study mode in year two.

In the final paper in this volume, McGuire reports on a very imaginative site analysis game for a level one archaeology course. By examining students' responses to brief reflection papers and their course work, McGuire determined that many were taking a deeper approach to their learning. The "game" encouraged students to push beyond the original expectations of the tutorials, a behaviour consistent with motivated students.

In this volume you will find much to inspire you and help you with implementing enquiry learning in your own work. In closing I'd like to offer up what I think is an especially fitting quotation. Postman and Weingartner (1971) tell us that "Once you have learnt how to ask questions – relevant and appropriate and substantial questions – you have learnt how to learn and no one can keep you from learning whatever you want or need to know."

## References

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## Biography

Vicki Remenda is a Queen's Chair in Teaching and Learning (2006-09) and Associate Professor of Geological Sciences and Geological Engineering at Queen's University. She was instrumental, through her teaching chair, in creating Inquiry@Queen's a consortium of faculty, staff and students, including Queen's Libraries, Learning Commons, Centre for Teaching and Learning, and student government, which seeks to provide opportunities for students to engage in enquiry learning. It provides a forum for the dissemination of the products of student inquiry via the Inquiry@Queen's Undergraduate Research Conference and on-line journal, Inquiry@Queen's: A Journal of Undergraduate Research ([www.iaatq.ca](http://www.iaatq.ca)).