

Follow the trail from learning to teaching with real world connections

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1. Abstract:

As a student, I had the honour to learn from dedicated teachers and mentors who created very effective learning environments. The experiences that stand out had real world connections. I introduce examples in a diary format, writing directly to three of my most memorable teachers and mentors. I then reflect on 15 years as a teacher of university courses, asking myself how I came to choose the kinds of assignments and class activities that I did. I conclude that many of my examples, and all that relate to the real world, I incorporated into my own teaching repertoire because I learned so effectively those same ways. I describe some of my examples, and show connections to theoretical and empirical studies on their value in student learning.

Key Words:

effective learning environments, real world examples, community service-learning, assignments, memorable teachers.

2. A Diary of Thanks to my Teachers and Mentors:

1976-1977. Grade 10 Science, taught by Bob Strom. Mr. Strom, thanks for making the time during class for me to explore possible career options by browsing those university brochures. Though at the time, I was pretty sure I would end up studying marine life on a Calypso-type ship a la Jacques Cousteau, I did end up studying and working in related fields. Thanks also for the time you took us to the Bamberton area on a night field trip to dig clams and learn about muddy shoreline ecology. Bringing our bounty back to the classroom, steaming and tasting them really helped cement the principles for me!

1977-1979. Grades 11 and 12 Biology, taught by Jack Nickolichuk. Thanks, Mr. Nick, for that amazing Grade 11 course that you designed as a set of modules. I could learn at my own pace, choose topics I found interesting and formats that I felt I was good at. If I didn't do that well on any of the modules, I could do it again, or do more to build up my grade. I remember measuring tide heights and conducting quadrant surveys in the intertidal zone near where I lived, learning how to use taxonomic keys with actual organisms in the lab and practising how to take good field notes for some of the modules.

In fact, the whole classroom encouraged me to study biology in real ways – the demonstration bee hive, the piranha aquarium, those huge glossy green tropical plants all around the class, and all the other paraphernalia found at every turn in the several rooms that was your office, lab and class. I also have fond memories of you teaching me how to develop and print school pictures for the high school annual in the darkroom that was attached to the classroom.

But there was so much more. Through the Biology Club you introduced me to reading peer-reviewed journal articles to explore basic topics such as photosynthesis from a new and challenging research perspective. The 'work and learn' days at a plant research centre and in an elementary school helped me see how to apply biology in the workplace, and narrow down my field of interest for the future. And I so much enjoyed helping to feed and monitor the fish near Goldstream; it was not only a lot of wet fun, but I knew that my contribution was valued by the volunteer group who oversaw the program.

1982-1983. The British Columbia Provincial Museum's (now Royal BC Museum) Vertebrate Zoology Division, curated by R. Wayne Campbell. I was so honoured, Wayne, when you agreed to supervise both my Honours Bachelor thesis and a related directed studies course about Bald Eagle ecology. I know how very busy you were then, and to this day I say without hesitation that you have worked tirelessly and contributed more than anyone in sharing knowledge and promoting awareness about the value of avifauna across BC and beyond.

You encouraged me, as an undergraduate student, to present my work at an international conference in Manitoba. And through summer work at the museum, I learned first-hand how breeding and sighting records contributed by amateur birdwatchers and professional ornithologists was valuable for such projects as long-term environmental monitoring and reference books that share the information with others. The field outings you kindly took us on near West Vancouver showed me the effort and skill involved in studying birds on small rocky islands (something I ended up doing for my Ph.D.) but also the huge scientific gains, and the fun, of working in the field. I still remember coming directly from the boat to the University of British Columbia (where I would end up registering for graduate studies 4 years later) to photocopy our field notes, while my pants were covered in cormorant guano from scrambling over the rocks counting nesting pairs!

3. My Time as a Teacher

When I ask myself why I chose certain kinds of assignments, or materials, or in-class activities, in the three undergraduate biology courses I taught at the University of British Columbia between 1994 and 2008, the answers almost always bring me back to my time as a student. I am referring to the kinds of activities and opportunities described above, where it was clear to me the value (and the fun) of learning when I could choose, or when we were out in the field, or when the 'real-ness' of it helped to motivate me to want to learn more on my own, or when I could see that my actions helped the community in some way, or when I was invited to be an active scholar on a paper or conference presentation.

Some of the other answers come from my experience leading natural history courses, tours and field trips, as non-credit continuing education courses in the community. Here, though there is no grade assigned, participants want to feel that their time and money was spent well. They want to 'get what they came for', which was usually some variation on learning how to identify birds in their natural environments, so that they could enjoy their outdoor jaunts and travel more. I also hope that the more

they learned about the natural world, the more they would want to help to protect it, so I build aspects of this important point into most things I teach.

Some of the common features of the effective learning environments I experienced as a student that I then made possible for my students relate to Chickering and Gamson's (1987) work. I have applied many of their 'Seven Principles' in my practice, especially active learning, communicating high expectations and respecting diverse talents and ways of learning.

Several examples follow, with links to theoretical and empirical studies:

Contribute to the community: In an ecology elective course for non-science majors, a group project, worth approximately 30% of the course grade, was conducted done through community service-learning. Students could sign up for a pre-structured Reading Week project in collaboration with UBC's Learning Exchange, or they could find an organization in the community on their own, find out its needs, and help them through volunteer work. A proposal, update, research paper, as well as a reflective component documenting learning and a clear effective way to communicate the project to fellow students, community leaders and colleagues from the Learning Exchange were ways that students earned their group project mark for this real world learning. Studies documenting the value of service learning at both affective and cognitive levels were summarized recently by Ratsoy (2008).

Learn in the field: In a vertebrate ecology course I taught, students worked in small teams to choose a one hectare plot in Pacific Spirit Regional Park. In this collaboration with the Greater Vancouver Regional District, they then documented the vegetation and animal life of their plot, visiting it many times throughout the Spring term. Snowfall afforded special opportunities to look for animal tracks! Students learned about conducting field work, surveys and identification. And while it could be tough heading into the wet west coast forest, many new skills could then be applied to future graduate study, consulting or other work.

In a multidisciplinary science field course in Baja, California, I and my fellow instructors (representing three fields of science) guided students to design and prepare for a field study while in Vancouver. They received feedback on their proposed study, collected the field equipment they would need to take with them, and when they set foot at their chosen ecosystem in Mexico, they learned how to switch to Plan B when necessary, and how most things take longer than you think they will, and how rewarding the reality of the study can be after months of planning. In this setting, the environmental challenge was to avoid sunburn or sunstroke while collecting data.

Brody et al. (2005) found that the use of ecological field studies for teaching and learning about science, nature and ecology resulted in positive impacts on teaching, learning and teacher professional development.

Design a study and present at a conference: I loved teaching. I also enjoyed asking questions about how students learn and how I could keep improving the course. It seemed natural and effective to ask the students these kinds of questions, and even better, to involve them. So I asked them if they would like to design a survey tool to find out the class impressions of a particular assignment, or more generally on what they

were learning in the course. I am proud to say that students have co-presented with me at several UBC Learning Conferences and UBC Farm Research and Education Symposiums, as well as at the 2006 conference of the Society for Teaching and Learning in Higher Education.

When I attend teaching and learning conferences, I always appreciate hearing from students first-hand. Now I also know how much students appreciate being active scholars talking about their and their colleagues' learning. Kenny (2006) has summarized several models of leadership development in the university classroom. Inviting students to actively take part in scholarly work and showing them the possibilities for them to present at conferences fits in with Brown's (2001) view on inspiring them towards lives of leadership and purpose.

Choose your assignments: 'Flexible assignments' worth between 2% and 10% each, could be chosen and combined to earn up to 20% of the course grade. There was a variety of formats such as teaching a mini-class, conducting an email survey of class members, posting a visual mini-poster, or asking or answering an ecology-related question from an item pulled out of a bag. Students chose their timing too, having to meet particular deadlines, but being free to choose how many they did early on and how many they did later in term. Flexible assignments helped students become more self-directed learners; this is described by Fink (2003) as 'learning knowledge'.

An unexpected benefit of these assignments was the community the students built early in term, especially through their online work. This carried over into class activities, where the rapport that is often more easily created through email helped all students in their face-to-face social skills.

Connect to the world in other ways: A learning portfolio final assignment, showing how students met the course objectives and how aspects of the course connected to other courses they were taking as well as to their lives outside of academia was a challenge to some students, and a delight to others who had never been asked to express their learning through a mix of text and images. Some of the final products are truly pieces of art!

Involving students in discussions about current events and issues; showing them (through field trips during class) what is happening right here on campus or in the community and how it relates to the principles and contexts of the course; asking them to share stories about the volunteer work they do and the places in the world they have been – these are all ways that we can help our students learn effectively through activities and assignments that they are motivated to work on. Fink's (2003) Taxonomy of Significant Learning highlights the importance of such activities to increase 'integration knowledge' (connecting ideas and information); 'human dimension' knowledge (learning about oneself and others) and 'caring knowledge' (developing new feelings, interest and values.)

4. Concluding Remarks and Take-home Message

It has been said that we teach the way we were taught. Well I remember experiencing a lot of one-way transmission as a student, especially in university, and I never taught that way. I think it might be more accurate to say that we teach the way we

learned best. I know that is true for me. I want to thank all of the great teachers and mentors I have had over the years. Special thanks to Bob Strom, Jack Nickolichuk and Wayne Campbell, who granted permission to refer to them by name. It was especially enjoyable talking to each of you, after, in some cases, some careful sleuthing to track you down after many years! I also want to thank my 15 years' of students, who agreed to take part in what, especially early on, was perhaps something they had never been invited to do before as a learner.

If you are a teacher, remember the great influence you can have on each of your students. If you are lucky, they will tell you about it; but even if they don't, know that they are thinking about you, learned from you and now might be using your fine examples to help their own learners. Consider the techniques you use in your own teaching practice. Ask yourself from where the idea originated? Why do you do what you do? As you reflect, you might find some helpful signs along the trail, be it a teacher or mentor who introduced you to it and inspired you, a reference to the theoretical basis for it, or a recent study showing its efficacy for student learning.

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