

The switch: Who teaches, who learns? A teaching professor and an educational developer transform their roles

**Michelle Yeo, Sarah Hewitt,
Mount Royal University**

Authors' Contact Information

*Michelle Yeo, PhD, Associate Professor,
Academic Development Centre,
Mount Royal University, Calgary, AB.
Phone: (403) 440-6494
Email: myeo@mtroyal.ca*

*Sarah Hewitt, PhD, Associate Professor,
Department of Biology,
Mount Royal University, Calgary, AB.
Phone: (403) 440-8755
Email: sahewitt@mtroyal.ca*

Abstract:

This essay is an exploration of the development and implementation of a flipped classroom in a first-year Anatomy and Physiology course. It is told dialogically from the perspective of the teaching professor and the educational development consultant as they worked through this process. A transformation occurred when the consultant became a student in the class for one unit of study. Implications for student learning, teaching, and consultation partnerships are explored.

Key Words:

Flipped classroom, educational development, student learning, transformative learning, consultation partnership.

Introduction

What you're about to read is a dialogue between a professor and an educational developer as they navigated a difficult, but ultimately successful, course re-design process. When the developer, acting in a consulting role, took a new perspective and became a "student" in the class for a unit of study, it opened up insights into the quality of the pedagogical approach and highlighted avenues for improvement that would otherwise have remained hidden. As importantly, it transformed the consultant-instructor relationship. The experience demonstrated new possibilities for discussion and insight, as we tried to understand the course from the student perspective. We have written this in a dialogic fashion, to represent each of our perspectives as we engaged in the process.

Sarah (instructor):

When was the last time you were a student? How often do you think about your courses from the student's perspective? We often attempt to do this – especially when we make wholesale changes to a course. We want to know if the changes we've implemented have made the material easier to learn, retain, and apply. But it's almost impossible to know, particularly since we are experts in our own fields and it's difficult to see the course from a student point of view. Unless you become the student. Or at least, the educational consultant does.

Michelle (consultant):

Under our course redesign project funding, offered annually from our teaching and learning centre, I commonly work intensively with a faculty member or group to look closely at a course – often taking it apart and putting it back together in a brand new way. However, the process we describe departed dramatically from my usual projects, in part because Sarah was attempting such a radical transformation while the course was actually running. It required some new strategies and approaches, culminating in my stepping into a learner role.

Sarah (instructor):

Same course – new delivery. This experiment was done in a first year Anatomy and Physiology course that has traditionally had one of the highest failure and withdrawal rates at the university. It is a content heavy course, historically taught with a lecture/exam-based model. Students take the course in their first year of the nursing program as a required course and are required to withdraw from the nursing program if they fail the course twice. Faculty in the nursing program have repeatedly observed that students who barely pass this course struggle in subsequent courses. Consequently, there is a lot of impetus to try to improve their understanding of the basic material in the first year.

Based on prior interviews with students, and the observations of faculty members teaching the course, the students struggle to find the best approach to learning so much content. Their retention of material beyond the exams is very poor, and for this reason, they are unable to make connections between later concepts that are based on, or identical to, earlier concepts. In an effort to help the students develop a more structured

approach to learning, retaining information, and making connections between concepts, I radically altered the course delivery.

Here, I'll focus on the first run-through of the new delivery – with a group of students where two thirds of them had failed in their first attempt at the course with the traditional delivery method. I hoped that a more structured system, which required them to engage with the material on a weekly cycle, would help guide them through the content-heavy course.

From lectures to concept maps. In consultation with Michelle, I re-configured the course by amalgamating shortened lectures and in-class group work, with some typical components of a flipped classroom – more work outside of class time that allows for more student engagement activities in class. We consider this to be a modified flipped model. A “flipped classroom” is one where the expectations of a traditional lecture are inverted, and “the information-transmission component of a traditional lecture is moved out of class time and replaced by a range of interactive activities designed to entice active learning (Abeysekera & Dawson, 2015, p. 2). We consider it a modified flipped model because some lecture was maintained but only for about a third as much of the class time than previously the norm. Students were expected to do significant work outside of the class on a weekly basis.

I had two goals – to force the students to engage with material outside of class time, and to help them make connections between concepts to see how some concepts are repeated in different physiological systems. In theory, this design should make learning easier and increase their depth of understanding.

The biggest change involved the development of skeleton concept maps. Von Der Heidt (2015) argues that concept mapping can powerfully contribute to deep learning for students. For each chapter, the students received a concept map that contained the basic headings and layout of the chapter material. These maps allowed them to condense all of the information from a single system onto one large map that was laid out to draw their attention to the connections between pieces of information. Outside of class time, the students filled these in however they wanted and received completion marks for them. I did not assess them for “correctness”, just as I wouldn't check to make sure their notes were correct. This process circumvents the nebulous advice of telling them to “study the material” out of class time, because it gives them something concrete to complete.

Furthermore, I created a series of video lectures that students watched outside the class and could view them repeatedly as needed. This meant that in class, I could give much shorter lectures (20-30mins) than normal, and we could use the rest of the class for review sessions, problem solving, and weekly quizzes that they completed both individually and in groups.

Michelle (consultant):

I was very excited about the approach Sarah was working on, and we spent considerable time the previous spring brainstorming and hashing out possibilities. Taking a course from a highly traditional approach, to one that was consistent with current learning theory and where I would work closely with the instructor throughout, was an inspiring opportunity.

Initial results and our early thought process

Sarah (instructor):

Our initial perceptions were mixed, and the students were polarized in their feelings about the approach. A handful of students reported that they loved the concept maps and videos, and they felt that this system really worked for them. On the first midterm, these students all increased their marks substantially as compared with their first attempt at the course. One student had taken the class with me in the traditional model the previous semester and failed. She was fully engaged in the new approach, and improved her course grade by over 40%. However, other students seemed frustrated and were not experiencing the same success.

One group of students was resistant to trying the concept maps, despite the fact that they were receiving marks for them. Some were also not watching the videos in preparation for the class or even the quiz. The group time was not always well used by the students, and the superficiality and sometimes total absence of questions during the review sessions, was quite surprising. This group of students was not doing well on the quizzes and the results on the first midterm, with a few exceptions, were not encouraging. I kept asking myself, is this working? Should I continue?

Michelle (consultant):

I began to worry that all of my well-meaning advice was not actually working in practice. Why wasn't it? Was it too much of a shift for students? Was it too labour intensive? Were there too many components? It was hard to know what direction to go. At this stage, part of my role was encouraging Sarah to persist. But it was easy for me to say I thought she should keep at it in our meetings – it was Sarah facing the students each week in the classroom.

Is the flipped classroom approach right for first year, content-heavy courses?

Sarah (instructor):

Like Mary-Ellen Weimer (2014), a strong proponent of student centered learning, we wondered if a flipped classroom model was appropriate for first year students. For this class, where so many had failed the course in the past, and had demonstrated patterns of passive learning and resistance to a more active approach, these reservations about the flipped classroom may be even more relevant.

Michelle and I questioned the amount of guidance needed for the students, and how best to use class time to move away from the straight lecture delivery. We wondered if they needed more support in their learning, or less – were the tasks too structured, not leading them towards independent learning? We considered whether asking students to complete concept maps, watch videos, as well as the in-class tasks, was too time consuming. However, even in the traditional model of the course, students require a serious time commitment to be successful.

Five weeks in, we were not seeing the results we had hoped – not across the board, at least. At this point, we decided to radically change Michelle's role as a consultant. Instead, she came into the classroom to take on the role of being a student.

Shifting vantage point: A consultant's perspective

Michelle (consultant):

As a consultant, I felt worried that all of my advice was, in fact, steering Sarah in the wrong direction. According to the learning theory, this approach *should* have been working. That the students were not responding as well as we'd hoped was perplexing. I tried to consider the problem from a different vantage point. I had encountered a book around that time by Rebekah Nathan (2005) *My freshman year: What a professor learned by becoming a student*. Nathan, as an anthropologist, takes a participant-observer role on her own campus, posing as a student and gaining a fascinating window into the academic and social world of university. This sparked me to suggest that I become a student for one topic (over a ten day span): to learn the material with the students and write the quiz with them. We were curious about what the experience using this approach would be like for me as a learner, especially given that I had not taken the previous course, and I hadn't taken a biology course for more than twenty years. How would it work for me to attempt the course material using this method of learning as a novice, and what insights could we gain? I also had become increasingly uncomfortable with the role of consultant – it seemed to me that always 'posing' as expert was hindering the process. Each week, I met with Sarah and gave her advice as to what to try. She would go away, try it, and report back – and I would advise again. The risk was all Sarah's, and I needed to contribute something where I had more at stake.

Sarah (instructor):

When we first decided that Michelle would come into the class as a student, I was nervous and excited to see where this would take us. I wondered how well this approach would work for someone with little to no background in anatomy and physiology, like Michelle. My delivery of the material would now be assessed in an entirely different way and this would quickly demonstrate the validity of this approach. I hoped that this approach would highlight obstacles to learning that we couldn't identify from the outside. We also thought this would tell us whether someone with no background in the area, like Michelle, could learn a difficult topic from scratch in the allotted time using these materials.

I often felt frustrated during our early meetings, when I would report to Michelle about my progress – and not giving the progress reports I had hoped for. What I noticed very quickly once Michelle had decided to participate as a learner, was how much our conversations changed. I was excited to work with someone who was willing to put herself in an unusual situation and it opened up new dimensions to our meetings. We now talked much more specifically about the material and Michelle could see exactly what I was trying to do in the classroom.

Reflections on the Learning Process

Michelle (consultant):

Following months of consultation and initiating the new approach, I stepped in to become a student in Sarah's class. The chapter I agreed to learn was the renal system. I was also nervous and excited. Could I learn the material? As a 'mature student' only

attempting a small portion of the course, while I did not have recent background knowledge, I did have many in-depth learning experiences and metacognitive strategies that I believed would help me. I found I quickly got very immersed in the task of filling in the concept map using the course textbook, and I spent several hours the first weekend working on it. Without the benefit of the learning in the previous course, and in the previous chapters of this course, I frequently had to look up terms in other chapters using the index. I began viewing the online videos Sarah had posted as well, finding them very helpful, as I could pause them to write notes or rewind them to replay things I didn't understand.

When I arrived in class, I was very happy to sit through the lecture and it was a completely different experience than observing a lecture as a consultant. The lectures went by very quickly and each explanation was important for my understanding. I knew Sarah was a skilled lecturer, but I appreciated this in a new way. I found that I began to make a framework in my mind regarding the chapter – helping me to distinguish the key information from the details, which I couldn't do at first at home reading the textbook. I was very nervous about the quiz but did very well on it, of which I was inordinately proud.

The question then became, what could my experience as an 'embedded consultant' tell us about ways to help the students? After much reflection and discussion with Sarah, we realized that two critical components of learning in this course are what we term the 'intention to learn' and 'pattern recognition'.

Intention to Learn

Michelle (consultant):

I was very determined to learn and understand the material, and to do well on the quiz. We started to realize that this was perhaps a key variable – what we began to think about as 'intention to learn.' I wanted to learn the material and it was important to me to do so. Therefore, I persisted at it, employing as many strategies I could think of to learn and remember the terms and processes, for example, explaining processes out loud to myself as I walked my dog. I felt excited when I made conceptual breakthroughs, such as when I grasped that there were two separate components to each part of the anatomy of the nephron in the kidney: the circulatory and the urinary, and most of the action of the nephron was simply oriented to moving things (water, nutrients, electrolytes) back and forth between these two systems in order to preserve the body's homeostasis.

I spent significant time on the chapter, about seven or eight hours in total. This is the amount of time instructors – whether in the traditional implementation or flipped model – agree is necessary for students to be successful in the course. Previous surveys found that this time commitment outside of class is one of the barriers to student success. While some students spend the time (and tend to be successful), many students struggle to spend that time. Part of the rationale for the modified flipped model was to essentially force continued practice on a week-to-week basis. However, I began to think about how the *motivation* to spend the time might actually be more at issue. Why did I spend this time? I expected to learn it, I wanted to learn it, and I believed that I could if I

spent the time on it. Previous research has shown that a critical component to student success is their belief in their ability to succeed given sufficient effort, or what Carol Dweck (2010) calls “a growth mindset” (p. 16).

Sarah (instructor):

When Michelle first brought up the phrase “intention to learn”, I had a bit of an epiphany. I hadn’t put it into those terms before but unquestionably, this is the difference I see between students who are successful immediately and those who are not. Perhaps, to some extent, this is just an innate characteristic in someone but I then started to be more specific in how I spoke to students who were struggling. I tried to point out the areas in which they had been successful and what they had done well. I wanted them to see that they weren’t far off and with just a little more effort – not the extreme amount that they perceived – they would be fine. And I believe I saw some changes in their attitude, at least for certain students. They needed to know that they were on the right track and that with just a bit more effort, they could succeed. They seemed more motivated.

Pattern Recognition

Michelle (consultant):

I began to recognize patterns of various kinds that helped me to learn the biology content. For example, I started to notice the importance of the naming conventions in anatomy. The terms, which at first seemed like a list of difficult to pronounce and remember jargon, soon revealed themselves as having names which could help you remember their position or function. For instance, “juxtamedullary” meant *next to* the medulla. Additionally, I knew that there is a medulla and a cortex in other organs, and this I imagined could help me to remember where to expect to find this part of any new organ I was learning about. It became clear to me that a fundamental concept in physiology was understanding how the body preserves homeostasis, and much of this is accomplished through moving molecules across membranes. It seemed to me that learning those strategies in one organ could easily help you to generalize in various ways. While Sarah consistently points out those patterns to students in her lectures, we wondered if there would be ways of making these patterns more conscious for students, some way of asking them to articulate or apply them – to begin to seek them out on their own. As Bovill, Cook-Sather, and Felten (2011) point out in their work on students as partners, “active learning implies not only a shift from passivity to agency but also from merely doing to developing a meta-cognitive awareness about what is being done” (p. 134).

Sarah (instructor):

For the students to recognize that there are patterns in physiology is really the whole goal. The misconception is that physiology is all about memorization. But there are many repeating patterns and concepts, albeit applied slightly differently, across the various bodily systems. Learn a concept once and you can just re-apply it the next time. One of the biggest struggles for students is to be able to see this and they tend to see each concept as brand new, treating it as yet another concept to memorize and move on. One of the reasons for introducing the concept maps was to force them to write or

draw out the concepts multiple times across multiple systems to highlight some of the repetitiveness for them. I think Michelle's skills as a learner helped her spot this quickly. I'm hoping that in future iterations that I can bring this even more to the forefront using the concept maps as a tool.

Implications for student learning

Sarah (instructor):

In the end, some students dramatically improved their performance from their first attempt at the course, while others were more resistant. In a cohort of students who have previously failed using the traditional lecture method, it may not be surprising that there is a more polarized response to change than in a cohort wholly new to the course. Indeed, I've since taught the course to a group that was learning the material for the first time, and there was very little resistance to this style, despite having taken the first half of the course in the traditional lecture method. It's possible that this initial cohort was a group of students less likely to take initiative in their learning and embrace active learning techniques.

One lesson from this might be that resistant students need a more stepwise approach to the flipped classroom rather than all at once. Students already predisposed to adopting active learning are eager to try new things and embrace the opportunity. Some students, perhaps resistant due to a recent failure, might need more feedback on how to use their concept maps and how to make the most out of these tools. Perhaps it would be better to slowly build in more videos and independent concept maps as the students discover the purpose and use of these materials. There will always be some who remain resistant, but I think that the majority, especially from what I've experienced since this first class, grow to see the value in this technique.

The students in this cohort who did embrace the flipped class not only improved their marks dramatically from their first attempt, but also reported how much more they felt engaged and felt that they had retained more material. They reported that they felt much more comfortable in the clinical setting – a setting which requires them to assimilate information and see links between the systems. They expressed pleasant surprise when they could actually answer questions being posed in their clinical placement, and that they understood everything that was happening at a much deeper level than before. This is exactly the outcome we were hoping for. It didn't happen across the board – the failure rate ended up being similar to what it had previously been, but the students who liked it, really liked it.

Despite the lack of dramatic shift in grades, I am convinced more than ever that the flipped delivery is a better system overall for this course. By mid-semester, the students were asking better questions that demonstrated a deeper understanding of the material. I've also since heard in our interviews that in follow-up classes, in their second year, that students are using their concept maps to help them with pathophysiology. Many report that they find it much easier to review their maps and re-acquaint themselves with the material, while other students who did not do the maps feel that they are re-learning it entirely. We are in the process of systematic data analysis to further study these impressions.

Since their final grades are not the only important outcome, and even though it is a content-heavy first year class, I am pleased with this new delivery style. I do think, however, that introducing the delivery differently for struggling students might be a good tactic.

Implications for Educational Development

Michelle (consultant):

Another insight gleaned from the experience was how the process of my being in the class as a student changed the very nature of the consultation. Sarah, after expressing some nervousness at my presence, seemed to become much more comfortable once I began to participate as a learner rather than only as an observer. At the beginning of the consultation, I was positioned as having the expertise, since the topic of the consultation was pedagogical. In becoming a learner in the course, Sarah's subject matter expertise came forward, creating more balance in the relationship.

What was also interesting was that during our meetings, a portion of the conversation was actually based on the content. I was reluctant to ask too many questions in class, as it seemed inappropriate. But I had questions, and we had some great discussions about the concepts of the course. Some of the elements that I found confusing, for example, the relationship between the kidney and blood pressure, seemed to assist Sarah in identifying concepts that would likely confuse students and which she could be more explicit about.

For me, after working in educational development for seven years, I found this to be the most rewarding consultation I had been involved in. I was invested in this course in an entirely new way.

Implications for partnership

Michelle and Sarah:

We ended the semester with a desire on our part to learn more about the students' learning and experience, through collecting evidence of learning and interviewing students directly. But additionally, it was a dramatically different day-to-day working experience for both Sarah and Michelle. For Sarah, she had the opportunity to discuss, in a detailed way, her observations and decisions regarding her teaching. The isolation experienced by teaching faculty as a daily part of the work was highlighted. While there is no obvious cost-effective solution to this problem, it is clear that professors could benefit from having the ear of a "critical friend" to discuss problems, puzzles, and successes in their teaching in a more consistent and structured way than that typically afforded by faculty life. Perhaps, as Tanner suggests, if the end goal is to develop "reflective instructors who are analytical about their practice and who make iterative instructional decisions based on evidence from the students sitting right in front of them" (p. 333), partnerships are one way to support reflective practice and experimentation.

For Michelle, the opportunity to become more deeply invested in a course, and to work through problems encountered in what she had advised to do, what "should" work according to current theory, was invaluable. Additionally, it was an important insight for Michelle to invest in the course as a learner rather than as an outsider or even an

observer. The outsider/observer role still allows a distancing, a lack of risk, and to a large extent speculation on the experience. While becoming a learner for a portion of the course was still limited in scope, it yielded important insights and a transformation in the consulting relationship.

One of the important observations we can make about the conversations we had is that the dialogue shifted from being entirely pedagogical to a back-and-forth between pedagogy and the content of the course. Engaging in the discipline created a different depth to the problem solving regarding the pedagogical strategies, giving both the consultant and the professor a different perspective and vantage point from which to consider the issues.

We additionally observe that in developing the consultation relationship, it is important for both parties to engage in elements of professional risk, and for both to establish elements of expertise. Reichard and Takayama (2013) argue for the importance of risk taking and dialogue, and for “embracing the idea of a *teaching commons*”:

Entering into and sustaining the dialogue in such a conceptual space requires receptivity to the unfamiliar: to be willing to ask new questions not typical of one’s discipline, to test our new methods of inquiry, to share one’s work with a new and different audience, and to take some risks. (p. 183)

We argue that through this in-depth course redesign consultation, such a teaching commons was inadvertently created, providing the professor support to persist in a flipped classroom strategy that encountered numerous challenges in its initial implementation. The second implementation, with two new groups of students, went more smoothly – greater buy in from students from the beginning, they worked hard at the concept maps, were successful in the course, and reported being pleased at their own progress. And importantly, the course was more engaging and satisfying to teach from the instructor’s perspective. Thus, we can see the importance of providing this kind of environment to support pedagogical innovation, particularly in courses that have firmly entrenched approaches historically established.

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