

The Impact of oCUBE: A Community of Practice for Biology Educators

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Abstract:

The Ontario Consortium of Undergraduate Biology Educators (oCUBE) is a community of practice that was established in 2008 by a group of Ontario Biology instructors to promote interactions among individuals with similar teaching and learning interests. The broad focus of oCUBE is to enrich the teaching and learning experience for both students and instructors of biology education. Unique features of oCUBE include its grassroots origins, collaborative structure, the UnConference model that provides the framework for semi-annual meetings, an online journal club, and its focus

on peer mentorship and support. It can sometimes be difficult to measure the impacts of communities of practice; however, personal reflections can reveal the novel impacts a community of practice has had on its members. Here, we report some personal reflections on the oCUBE experience and impact. These impact statements have been organized into the following categories: (1) Collaboration; (2) Knowledge translation and transfer; (3) Appreciation of different perspectives on teaching and learning; (4) Mentoring, support, and formative feedback; (5) Building relationships; (6) Transformation; and (7) Increased engagement with the scholarship of teaching and learning.

Key Words:

community of practice, grassroots community, knowledge mobilization, collaborative learning, biology education

Introduction

“If you have an apple and I have an apple and we exchange these apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas.” – George Bernard Shaw

University teaching has traditionally been perceived as mainly a private and individual activity, requiring little, if any, previous formal training in teaching (Brownell & Tanner, 2012; Schussler, Read, Marbach-Ad, Miller, & Ferzli, 2015). Although this view is slowly changing in a few places, teaching abilities are not consistently considered an important asset in job recruitment. The Ontario Consortium of Undergraduate Biology Educators (oCUBE) seeks to change this view by supporting an updated model for teaching biology that is evidence-based, collaborative, and dynamic through the sharing of resources, ideas, and advice among its network of colleagues (Kajiura et al., 2014; Wenger, McDermott, & Snyder, 2002). While it is one of many associations dedicated to improving teaching in the sciences, it is unique in Ontario because of its grassroots origins, open collaborative structure, diverse membership, and its focus on peer mentorship and support.

Founded in 2009, oCUBE is a community of practice (CoP) (Cambridge, Kaplan, & Suter, 2005; Loertscher, 2011) that brings together biology educators from Ontario’s universities and colleges, forming a loosely organized collective that fosters professional teaching development, curricular innovation, educational research collaboration, and the sharing of ideas and information about teaching and learning. Our goal is to share and promote best practices in scholarship in biology higher education across Ontario and beyond. Two annual UnConferences serve as cornerstones of this effort, providing opportunities for members to interact face-to-face. Throughout the year, our consortium remains connected through a variety of online formats including our oCUBE website: <https://sites.google.com/site/ocubeorg/home>, monthly e-newsletter, online journal club, online chats, social media (Twitter: @ocubeorg), and a listserv.

The oCUBE CoP is a collaborative network sharing needed teaching resources and expertise and, while it is difficult to measure the impact of communities of practice generally (Ropes, 2010; Wenger et al., 2002), the efforts of members to maintain and

expand oCUBE from year to year indicate indirectly its importance to them. oCUBE has several unique features that allow its effects to be particularly powerful and wide-ranging. Further evidence is provided in our 2013 survey where 65% of oCUBE members reported that the oCUBE CoP was “very useful” or “extremely useful” in improving their teaching practices, with an even greater number agreeing that participating in oCUBE helped to renew their enthusiasm and passion for teaching (Kajiura et al., 2014). In the remainder of this article, we present descriptions of various components of oCUBE, many of them unique to this CoP, along with personal reflections from members, which highlight these key distinguishing features and their impact on our members’ teaching and professional development.

Features of oCUBE:

Membership

Although limited to individuals working within biology, our membership is broad, encompassing mid-to late-stage graduate students, postdoctoral fellows, sessional instructors, lab instructors, and biology instructors (faculty and staff). We deliberately seek a diverse set of opinions to help us improve our teaching, and the oCUBE membership includes individuals of varying experience, from those who are just discovering best practices in teaching to educators who have been implementing and refining these strategies for decades. As a result of this diversity, the benefits that individual members derive from oCUBE differ, and may vary depending upon a person’s situation at a particular time: if they are preparing for tenure or permanence review, if they are struggling with a particular teaching challenge, if they just need some perspective or to recharge, the membership as a whole provides support to those people, just as it does to those who are beginning their teaching career. Indeed, over 90% of oCUBE members reported that the UnConference was very or extremely “effective at renewing their enthusiasm for teaching” (Kajiura et al., 2014).

What appealed to me as a final year graduate student was the fact that there was no segregation during oCUBE, no hierarchy of any sort!

– *UnConference 2015 Participant*

When I first started going to oCUBE meetings I felt so thankful to have mentors that guided me through my first science education research studies. Now I find that I can mentor new oCUBE members and I can see how the cycle continues.

– *UnConference 2015 Participant*

oCUBE helps keep me excited about teaching, see my teaching from a different perspective, and helps me to stay sane. – *UnConference 2014 Participant*

The oCUBE Community of Practice strives to be accessible to members by (1) having no annual membership fees, (2) providing assistance for post-doctoral fellows and sessional instructors to attend the UnConference, and (3) engaging in diffuse authority. To keep costs low and encourage the participation of as many individuals as possible, particularly those representing groups with little access to professional development funding, none of the oCUBE events, including the UnConference, have a registration fee. Attendees must cover only lodging and food costs, and sharing rooms can further reduce these costs. Each year, through fundraising, oCUBE has helped

defray the costs for participants with little or no access to professional development funds (e.g., sessional instructors, postdoctoral fellows, and graduate students). This format allows for a broader representation and a diverse mix of views and perspectives on undergraduate education. In particular, it makes accessible a rich opportunity for professional development, mentoring and networking to those who are just beginning their teaching careers, in positions that are generally less secure. We continue to work on new and more effective ways to engage and mentor these colleagues, and to enable all members to connect regularly between meetings.

UnConferences:

At the heart of oCUBE are its members, and our primary mandate is that "there are no tourists" (see Table 1). One key feature of oCUBE is that anyone can participate and that everyone has a responsibility to contribute ideas, time, and effort to bring the group together, sharing and discussing relevant issues and innovations in teaching and learning. The group is diverse in many ways, including biological fields of study, teaching experience, and roles within departments, yet even the most junior or inexperienced member contributes valuable knowledge.

Members are brought together twice annually at UnConferences, where the agenda is not decided months ahead of time, but rather is determined by participants at the start of the meetings (Hamlin, 2014). The December UnConference is a one-day event that allows members to reconnect in person, allowing them to take a break from their normal academic duties and reflect at the end of the busy fall term. Its primary purpose is to share new ideas and experiences from the recent semester, as well as begin planning for the three-day UnConference in May. The May UnConference is organized by, and for, the members of oCUBE, with the UnConference model chosen to provide flexibility and keep participants' costs low. Its goal is to bring together a diverse group of biology educators (established professors—both teaching stream and research stream, sessional instructors, lab coordinators, post-docs, and graduate students) and create a relaxed and informal atmosphere for doing significant and thoughtful work: providing timely discipline-specific professional development in the scholarship of teaching and learning within a supportive, collaborative environment.

Typically the group attending an UnConference includes not only established and new oCUBE members, but also one or more teaching specialists from outside the province. This helps to enrich discussion and facilitate the sharing of new ideas. With the exception of about three pre-planned sessions, which are normally provided as keynote sessions by an invited participant or sessions on a topic identified to be of interest to the majority of the members, the agenda emerges in real-time and reflects the current interests of the participants. On the first evening, a "Short" five-minute session is given by each attendee to introduce him/herself and provide a synopsis of a teaching experience. The remaining sessions are decided by "votation", a process that involves participants submitting one or more potential topics for discussion then providing a short description of the topic(s), followed by attendees voting to determine which ones are the favoured topics of the group. One or more facilitators are identified (it is not necessary to be an "expert") and a subgroup of members develops the schedule. Depending on the topics and the group's interest, discussions are scheduled

as either a “Great Idea for Teaching” (GIFT) session of about 30 minutes or a “Big Idea Group” (BIG) session of about 60 minutes.

The May UnConference is held off-campus at a distant locale to encourage participants to be focused “in the moment”. The group strives to make this UnConference open and accessible to a wide range of participants who are interested in improving undergraduate Biology education. As for membership, there is no registration fee (participants are responsible only for food and lodging) and through fundraising, some financial help is available to those with limited access to professional development funds. To facilitate focused discussions and reduce distractions, the UnConference has a set of “enabling constraints” (Table 1). These rules are similar to rules of a team sport such as soccer, where you can't touch the ball with your hands, but other than that the UnConference remains flexible. Playing by these rules helps to limit wasted time complaining (or spitting or story-telling) without limiting possibilities for discussion (Davis & Simmt, 2003). This allows us to move towards more purposeful thought of what we can do with what we have. Throughout the UnConference there is an emphasis on scholarly teaching and evidence-based practises.

Table 1. Guiding constraints of oCUBE UnConferences, in a humorous manner.

Constraint	Explanation
No spitting	It's just common sense. Also references the sometimes seen human propensity to put ourselves and others down.
No telling stories that aren't your own.	Outside of the scribe records of sessions at the UnConference, what happens at the UnConference stays at the UnConference.
No leaving, unless you need to.	UnConferences are inherently participatory and thrive on the committed and undivided attention of participants. Participants are asked to be discrete in dealing with outside demands on attention.
No being a baby unless you are one.	No one but you is going to ensure your comfort/satisfaction. If you don't like something, then initiate a change.
No tourism	The success of the UnConference is driven by its participants, so attendants agree to actively participate and take responsibility for some part of the UnConference [e.g., facilitating a session, serving as a scribe or time-keeper, or leading a relaxation session (oCUBE therapy)].
No complaining about students	Rather than being distracted by the few challenging students we encounter, we need to be resilient and celebrate those students who inspire us to elevate our teaching practices.
No complaining about colleagues who aren't present.	Focus on building relationships and being inspired by the colleagues who are at the UnConference.

No complaining about lack of resources	All of us face a lack of resources whether it be time, money, or people. The support of oCUBE allows us to help each other and figure out how to do the best that we can with what we have.
No complaining	Figure out what works, why it works, appreciate that it works, and try to figure out how to have more of it.
No going over time	In order for every person to get his or her say, no one gets to say everything. This is why timekeepers are awesome.
No professing	The UnConference is about interaction, in which a facilitator (not a presenter) is charged with the responsibility of maximizing the learning of the group (of which they are just one member).

We are also committed to disseminating and sharing beyond the UnConference in a variety of ways, such as through our website (ocube.ca), monthly newsletters, and via presentations at external conferences including the annual Society for Teaching and Learning in Higher Education meeting and the biennial Western Conference on Science Education.

I was trusted to lead a discussion group of one of the questions that I personally had interest in (effective feedback). This experience has made oCUBE 2015 not only a valuable workshop, but also a personally-relevant and immersing experience. – *UnConference 2014 Participant*

I think the greatest strength of the UnConference is that it is a safe place to share our failures and our fears. It is not uncommon to hear a colleague open a session with 'I have this problem in the classroom and I need some feedback and advice.' or 'I tried something new this term and it was a total disaster. I need to sort out what happened and how to improve things for next time.' It is at those times, as we all jump in with compassion and humour to offer suggestions, advice, and our own personal experiences, that I feel the UnConference is at its best and is accomplishing something that most conferences never can - a place to meet our peers and colleagues and say 'I don't know what to do and I want some help'. – *UnConference 2014 Participant*

Online Journal Club:

It can be difficult to sustain communities of practices when members are spread out geographically and lead very busy lives. A monthly online journal club using video conferencing software encourages an evidence-based approach to teaching, allows participants to become familiar with, and keep current with, the literature, encourages a scholarly approach to teaching, and also provides a touchstone during the more hectic times of the year. This opportunity to see and talk to each other in between the semi-annual meetings, also helps deepen the sense of community. We are not so much an

online community, as a community that uses technology to sustain our community of practice.

The online journal club helps me to feel connected to other oCUBE members, and provides a timely sense of perspective in the midst of a chaotic teaching term. – *Online Journal Club Participant*

oCUBE Impact: Personal Reflections

As previously indicated, it can be difficult to measure the impact of communities of practice (Ropes, 2010; Wenger et al., 2002). Some indication of impact can be found through personal reflections of the membership. These reflections have been categorized below into various categories, including: (1) Collaboration; (2) Knowledge translation and transfer; (3) Appreciation of different perspectives on teaching and learning; (4) Mentoring, support, and formative feedback; (5) Building relationships; (6) Transformation; and (7) Increased engagement with the scholarship of teaching and learning.

Impact 1: Collaboration

When new members come to the May and December UnConferences, a word that they commonly use to describe these gatherings is “collaborative”. The atmosphere and the interactions is one of sharing and everyone participating, very different from research-based conferences where there is a competitive atmosphere or a concern of being ‘scooped’. In fact, oCUBE fosters collaboration, encouraging the incorporation of teaching tools and techniques that members have found beneficial to student learning.

The oCUBE UnConference was the first meeting I ever attended where I felt that no one was in competition – everyone was genuinely there to help and learn from one another. Because of this, I think that participants are much more open with sharing ideas and experiences of all sorts – both successes and failures. Through participating in oCUBE I’ve been able to listen about other people’s mistakes and share my own mistakes – and that is very valuable dialogue.
– *UnConference 2015 Participant*

oCUBE’s mantra – “Don’t be a tourist” – ran through my mind as I sat down at my very first December meeting at the University of Ottawa. As the meeting started, I was reminded of what I love most about oCUBE: its fearless commitment to allow participants to form the agenda at meetings. I seized my opportunity by simply asking if we could discuss ‘Just in Time Teaching’ (JiTT) approaches and ways I might incorporate them into the first-year biology course I would be teaching the next semester. I’d known about JiTT for years and had been enticed to incorporate it into my teaching, especially after seeing an excellent presentation about the technique given by James Fraser from Queen’s University. But not long into the planning process for my own courses, I would hit a logistical obstacle and another semester would go by without trying the technique. And therein lays the true strength of oCUBE: it provides an open forum to ask the kinds of questions an instructor needs to have answered in order to implement something new. Within 45 minutes, on that December morning, I’d received enough information to side-step the obstacles that had prevented me from trying

this new technique. Not only was it successful when I tried JiTT that January, it was more successful than I had anticipated. Questions I received from students, as part of the JiTT approach, increased their engagement with the course material and enabled me to explore concepts more deeply. Perhaps most importantly, it enhanced the dialogue I could have with my students so that I could better appreciate their challenges with the course material. Adapting my lectures based on student feedback has enriched the teaching and learning experience, and oCUBE deserves the credit for getting me over the hurdles I initially faced when trying something new. The oCUBE December meeting is a forum unlike any other I know of as a post-secondary educator: a place to openly discuss the practical application of state of the art teaching and learning.

– *UnConference 2014 Participant*

Impact 2: Knowledge Translation and Transfer

An important role of oCUBE is to facilitate knowledge sharing. The two UnConferences are opportunities to share ideas, teaching approaches, and experiences with new pedagogical approaches. In addition, resources are shared via a wiki/google website and other venues. Through oCUBE connections colleagues share even more detailed content such as PowerPoint presentations, case studies and exam questions. This knowledge sharing benefits more than the individual teachers. It creates a context for the rapid informal transfer of new and successful curricular approaches across the province, thereby enriching curriculum at all institutions.

The organization also provides colleagues with a new window into biology curriculum development and program administration in Ontario's higher education sector. oCUBE members conduct inter-institutional comparisons of departmental and university-level administrative components; we have surveyed oCUBE members regarding departmental policies on TA (teaching assistant) hours and training, core learning outcomes, grade review process and oversight, selection committee interview questions, examples of scholarly work, and teaching professor duties.

As the Undergraduate Program Director in a large department, I often find myself asking "I wonder how they handle X at other institutions." I now have a very rapid and effective way of answering such questions, whether it relates to course administration of huge first year courses, TA issues, or policy around grade distributions. The oCUBE connection has helped me ensure we are administering our program informed by best practises elsewhere within the province. – *oCUBE Member, 2016*

An important impact is the ability to get expert input from teaching specialists from across the province easily and quickly. One also develops friendships and trusting professional relationships, which create a comfort zone for being vulnerable, identifying and sharing weaknesses related to teaching, and seeking to improve. As an administrator I have used the oCUBE membership (via the list serve) to learn more about various aspects of curriculum structure, delivery and administration in other Ontario institutions of higher learning. This resource has been very valuable. Finally, the time spent as a group permits the "recharging" of one's teaching batteries, and most return to their work re-energized, enthusiastic

and ready to try something new. The group inspires us to do more in the classroom and do it better. – *oCUBE Member 2016*

oCUBE members are also very willing to share their experiences about what didn't work in the classroom. The value of learning from mistakes, and sharing 'failure' experiences is emphasized at the UnConferences.

For the last 4 years I have been working on developing a flipped 2nd year course that will work with over 100 students in a lecture theatre classroom and no additional TAs. Not having any experience with this type of course and dealing with some local scepticism, I not only found my oCUBE colleagues to be a valuable source of ideas and advice, but each year was able to share my latest challenges and disappointments without fear of judgement or embarrassment. And that sharing was cathartic - there was always someone else who could relate, and inevitably there was laughter and some solution that evolved from our discussions. They gave me the courage to keep moving forward and helped me put the challenges and failures in perspective. – *oCUBE Member 2016*

Impact 3: Appreciation of different perspectives on teaching & learning

As in almost any human endeavor, there is no right answer when it comes to effective teaching. What works well for one particular class and educator may not work under different circumstances. While the oCUBE philosophy is to take an evidence-based approach, that does not mean there are not differing opinions on teaching and learning, whether it is assessment, classroom activities, curriculum design, pedagogical tools or course administration. Engaging in debate and sharing differences of opinion helps to broaden perspective and encourages members to try new things and think about teaching in new ways.

I had always viewed TurnItIn as a punitive tool for identifying students that had committed an academic offense. However, conversations at oCUBE made me realize that TurnItIn could be used instead as a teaching tool that could be used to help students gain an awareness of their need to improve paraphrasing skills. For all first year students, I now allow them to use TurnItIn on a draft essay and give them the opportunity to improve their paraphrasing skills.

– *UnConference 2015 Participant*

Impact 4: Mentoring, Support, and Formative Feedback

Just as in research, a support network in teaching is vital but in the university environment it is typically less developed (or can be non-existent). While many departments have established mentorship programs for new researchers, it is often difficult for educators in teaching-focused roles to find mentors and colleagues with similar goals. Likewise, graduate students interested in education may find it challenging to find guidance and mentorship for teaching, especially as it is often viewed as a necessary interruption to research rather than a worthwhile pursuit on its own (Schussler et al., 2015). oCUBE provides a support network and knowledge-sharing community that fills this gap for Biology educators. Both mentorship and our interactions with "oCUBEE's" (new members who are just starting their teaching journeys and are looking for role models and professional "exemplars") play a vital role

in the sustainability of our oCUBE consortium. In fact, oCUBE is a place where mentors can be mentees, and mentees can be mentors.

I have always felt like a square peg in a round hole in my department of highly dedicated researchers. At my first UnConference, 7 years ago, I felt like I was finding a long-lost family. And because of the sense of mutual support, and the UnConference structure, I felt like I could make valuable contributions, despite being less educated in pedagogy than some other members. This, in turn, led to increased confidence, so that soon, with help and advice from my oCUBE colleagues, I found myself trying new strategies, and disseminating those strategies within my own department. – *oCUBE Member 2016*

oCUBE members routinely provide formative feedback to peers within oCUBE. Another distinctive feature of oCUBE is the speed at which we can get feedback from peers and mobilize knowledge between members via online meetings, tweets, emails, phone calls, and Skype, despite the fact that members are spread across the province of Ontario.

Before I went up for promotion for permanent status at my institution, one of my oCUBE colleagues came to do a teaching observation and gave me feedback that I incorporated into my teaching practice. It was very valuable to have feedback from someone outside of my institution, and this feedback put several teaching approaches on my radar that I had not previously considered.
– *UnConference 2015 Participant*

Impact 5: Building Relationships

In 2011, we hosted our first invited participant (Craig Nelson, Indiana University) as a joint venture with the Education symposium of the Canadian Society of Zoologists, which several oCUBE members were organizing. Since then we have made the practice of inviting participants a regular feature of the oCUBE May UnConference. When we invited Todd Nickle of the Alberta Introductory Biology Association (AIBA) in 2014, we not only benefited from new ideas that he provided, but a new partnership was born. Since then, each year, both oCUBE UnConference and AIBA annual meetings have been attended by members from the other CoP. We are now working on connecting with other communities of practice, including those in the United States.

My visit to oCUBE as a representative of AIBA left me fascinated by the relaxed community of learning fostered by their diffuse leadership. Exploring learning together with some basic rules (e.g. no tourism; no spitting; no bitching) was a great opportunity to collaborate for thoughtful education. Just as we support our students when they take risks and investigate new, uncomfortable territory, oCUBE provides advice and safety for its own participants.
– *Todd Nickle, Guest to UnConference 2014*

Impact 6: Transformation

As oCUBE aims to transform Biology education, we encourage our members to critically and constructively reflect upon our experiences. We are committed to impacting not only the current educational landscape, but also future educational

domains. In conjunction with encouragement from other oCUBE members we work to develop class structures that moved away from lecturing and more engaging, interactive, experiences, while supporting each other by collaborating on materials. A group of genetics instructors collaborated on changing the landscape of their classes through the integrated implementation of two-stage exams, two-stage tutorials, and sharing of clicker questions.

I have redesigned several of the classes I teach. These redesigns have been based on best practices in the literature as well as personal input from oCUBE members. Going through this process has transformed the way I think about biology education specifically, and teaching and learning in general. When approaching teaching, I now think much more like a scientist and go to the literature to see what has been done before and what has evidence of effectiveness. – *UnConference 2015 Participant*

Impact 7: Increased Engagement with SoTL

The scholarship of teaching and learning (SoTL) has been a recurring theme at the oCUBE UnConferences, with members discussing novel approaches to teaching and learning as well as their pedagogical studies that evaluate these approaches. Also, through member donations, we support two prizes at Ontario Biology Day, a two-day event at which undergraduate researchers present their work in a conference setting. The prizes are for students engaged in pedagogical research and are awarded in the Science Education category of the conference. By awarding accolades to undergraduate students, we are planting the seeds that education and pedagogical research are of great significance. Ontario Biology Day has also served as a platform to promote oCUBE to a broad audience.

I am more aware of the scholarship around teaching and learning and this has helped me to begin to examine my approach to teaching, the baggage I may be dragging along with me, and what I can, or perhaps should, be doing to help me to be a more effective educator. – *UnConference 2015 Participant*

Conclusion

The Ontario Consortium of Undergraduate Biology Educators is an enthusiastic collaborative team. As the educational landscape evolves, our members (<https://sites.google.com/site/ocubeorg/people>) continue to display a shared domain of interest in teaching, which sustains our community of practice to improve current and future generations of Biology educators. Through establishing and maintaining community of practice networks, we can successfully serve as agents of change to improve Biology education.

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