

# **Knowledge mobilization across boundaries with the use of novel organizational structures, conferencing strategies, and technological tools: The Ontario Consortium of Undergraduate Biology Educators (oCUBE) Model**

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## **Abstract**

*The Ontario Consortium of Undergraduate Biology Educators (oCUBE) brings together over 50 biology educators from 18 Ontario universities with the common goal to improve the biology undergraduate experience for both students and educators. This goal is achieved through an innovative mix of highly interactive face-to-face meetings, online conferencing platforms (wiki and video conferencing), monthly online newsletters, and other activities. The beauty of the oCUBE model is that it meshes with the active learning methods that its members use in their own teaching. It also creates a community of practice with intra- and inter-institutional collaborations that assist in resolving educational issues of both common and immediate importance to oCUBE members. oCUBE members report that oCUBE activities and resources are very effective in helping them learn new teaching strategies and in developing professionally.*

## **Introduction**

The Ontario Consortium of Undergraduate Biology Educators (oCUBE) is a community of practice (CoP) bringing together Ontario educators, and serving as a nexus of expertise and enthusiasm for innovation in teaching. Community of practices are comprised of groups of individuals who share common concerns, challenges, or interests, and who expand their expertise and knowledge in these areas by interacting on an ongoing basis (Wenger *et al.*, 2002; Loertscher, 2011). Consistent with this definition, oCUBE was founded in 2009 by a small group of educators from five universities in Ontario with the goal of improving the quality of the undergraduate biology experience for both students and educators. Since 2009, the group has grown to include educators from 18 Ontario universities. oCUBE is dedicated to enhancing faculty engagement; providing peer support and mentoring to new and experienced faculty and graduate students with an interest in teaching; sharing and disseminating best practices in Biology teaching; and thereby, ultimately improving student engagement, experience, and learning. The oCUBE model of faculty development builds on the suggestions by Steinert *et al.* (2006), who indicated that faculty development programs should broaden their focus, consider diverse training formats, and foster collaborative partnerships.

The use of a CoP in Ontario higher education is novel in that it uses a highly collaborative bottom-up approach to meet its goals, and depends upon contributions from its members. oCUBE is a dynamic learning system that relies on the diversity and collective experiences of its members. Face-to-face meetings and a variety of online approaches are used to foster communication and the exchange of ideas among members, including an innovative UnConference (described below) that is critical for the success of the organization. These approaches have allowed oCUBE to develop into a robust and effective CoP that helps members learn new educational strategies and develop professionally. Knowledge mobilization involves the relationship between research and practice (Levin, 2008). Making knowledge readily accessible is a key goal of oCUBE. For oCUBE, “knowledge mobilization” uses a two-pronged approach, by not only taking research and putting it into practice, but also allowing members to do so more efficiently and effectively than if we were working through issues on our own. We have members who know a variety of systems at a variety of institutions. We can find our commonalities and use this information to better our offerings. With this oCUBE design, we are able to maintain momentum. As new ideas crop up in the educational literature, they become topics of interest for our membership, and consequently they become the foci of the community.

Thus, the underlying goal of oCUBE is general enough to sustain itself, even as the specific interests evolve. For that reason, oCUBE has not been a short-lived community of practice. There is also diffuse authority, community spaces, a value focus, enabling constraints, and familiarity and excitement to achieve goals within oCUBE. **Table 1** summarizes these characteristics of successful learning systems (Wenger *et al.*, 2002; Davis & Simmt, 2003) and how they relate to the oCUBE experience. This paper describes the organizational structure and activities of oCUBE and provides evidence that its members perceive this CoP as an engine of knowledge mobilization for both dissemination of pedagogical research and informal “how to” practical/logistical information that are key to improving teaching and learning in Biology. Our members view oCUBE as an arena for professional development.

**Table 1** *Characteristics of successful learning systems (adapted from Wenger et al., 2002; Davis & Simmt, 2003) and how these characteristics relate to the oCUBE Model*

<b>Characteristics of Successful Learning Systems</b>	<b>Links to the Ontario Consortium of Undergraduate Biology Educators (oCUBE) Model</b>
Diversity & Evolution	Members are from different sub-disciplines within Biology and different institutions, have different types of academic appointments, are at different points along their career paths and are interested in different topics. New members bring new interests and may pull the focus in new directions. The CoP frequently self-reflects in order to adapt to its growth and needs.
Collective Experience of Members	The collective activities of members enable the access, sharing, extending, and applying of evidence-based practices for enhanced teaching and learning. This provides leadership and mentorship to new and existing undergraduate biology educators.

Diffuse Authority	Decision-making is widely participatory. No one owns the community; it is an environment of shared and voluntary responsibility and all are encouraged to foster the ideals of the community in their own way. oCUBE members volunteer for various roles to sustain our CoP.
Community Spaces & Rhythm	oCUBE creates and maintains spaces enabling members to meet and exchange information on an ongoing basis. The CoP supports many different types of interactions. These include a wiki site, annual UnConferences, virtual online meetings, journal club, newsletters, and collaborative research projects.
Enabling Constraints	Members agree to the rules of the game when participating in oCUBE community spaces – a set of mutually agreeable boundaries within which members are free to create. Rules include a commitment to confidentiality, shared responsibility and participation, attentiveness, and positive attitudes.
Familiarity & Excitement	Participation in oCUBE online meetings, face-to-face December meetings, UnConferences, and monthly newsletters provides a strong sense of community, while offering opportunities to explore novel interactions and content.

## Knowledge Mobilization via UnConferences

We have adapted a unique UnConference model (Hamlin, 2014) for our annual meetings, providing a process to set the agenda, conduct the sessions, and record discussions. The UnConference allows members to explore teaching-related topics of mutual interest, learn about new teaching strategies, and get to know one another. There is no pre-determined agenda to the UnConference; instead topics are proposed, voted on, and selected during one of the first sessions of the UnConference using dotmocracy (i.e. voting with dot stickers on forms) or an electronic response system (i.e. clickers). Discussed topics are diverse and include curriculum development, interdisciplinary research collaborations in course design, teaching using online technology platforms, concept inventories, and assessment tools of scholarly activities.

During each UnConference session, one member facilitates the discussion, another member keeps time, and a third member scribes the session notes. Participants agree to a set of guiding constraints (e.g. all attendees are active participants). The session notes form the basis of the UnConference Proceedings that are edited and posted on the oCUBE wiki (Bayfield *et al.*, 2010; Garside *et al.*, 2013). The 2013 Proceedings, for example, is a 40 page document that includes such topics as: best methods for communicating with students, conducting group exams, and fostering scientific writing. The oCUBE model enables the collective promotion of productive interactions in our teaching, focusing on working and resolving issues/challenges

currently important to our oCUBE membership, and harnessing energies into creative documents and useful resources to be shared both within and beyond our community and disciplines.

## **Knowledge Mobilization via Wikis, Online Meetings, & Monthly Newsletters**

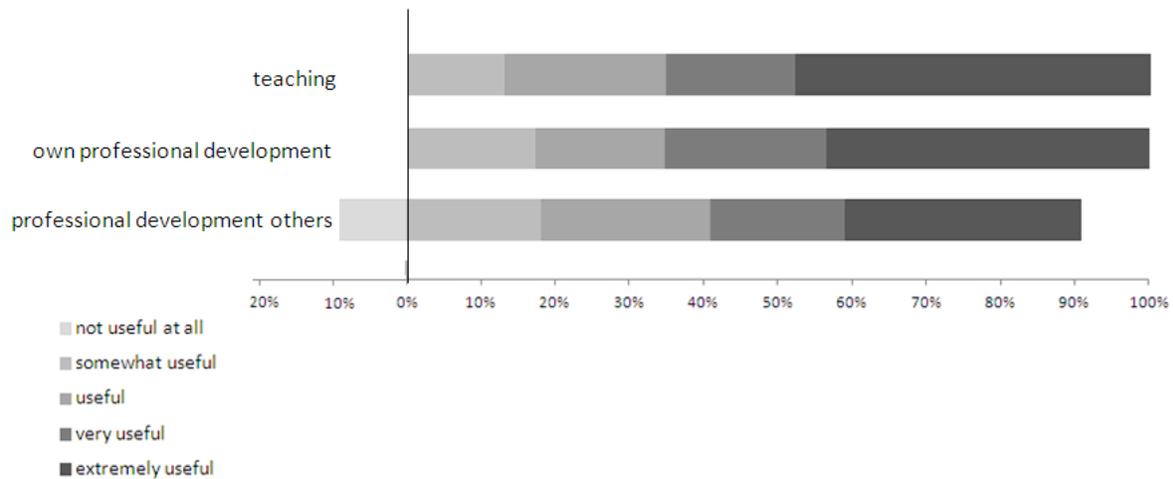
Face-to-face meetings, including the UnConferences, are key opportunities to build inter-institutional relationships; however, funding and teaching schedules restrict oCUBE to holding these types of meetings on an annual or semi-annual basis. Therefore, we developed a number of other strategies to maintain the momentum of the CoP during the remainder of the year, and foster communication among oCUBE members and others. We use a wiki website (<http://ocube.wikispot.org/>) as a focal point for information related to our activities, such as online meetings, journal club, and monthly newsletters. The wiki has been instrumental in permitting and encouraging input from its members, further enhancing the networking and collaborative facet of oCUBE. Our wiki is unlike a regular website in that it is modified by oCUBE members rather than one webmaster or administrator, thus the wiki provides insight into the organization and the driving interests of its members. For example, the wiki contains a number of expected items such as a “Biology Educator Toolbox” that contains annotated lists of resources, an “oCUBE Helpline” where members with particular expertise list questions with which they can offer or request help from others, and a “Book Club”. There is also “Exotica”, which is an annotated list of interesting papers that can be used as examples of biological concepts which can enliven our lectures and our teaching. Online meetings (usually monthly) are held using online collaboration platforms (e.g. Blackboard Collaborate or Adobe Connect) and provide an opportunity for members to further discuss topics raised at the UnConference, or other issues. Scheduling is determined by polling members, and then communicated via the wiki and/or newsletter (with emailed reminders). Online meetings are also used by subsets of members as needed (e.g. preparation for UnConferences). Because scheduling of meetings (online and in person) often permits only a subset of oCUBE members to participate, the monthly newsletter ensures connection amongst all members. A communication steward solicits input from members each month and produces a one to two page document that typically includes a summary of the highlights from recent meetings, upcoming events, listing of individual members’ achievements/experiences, and any other relevant information to the CoP.

## **Impact of our oCUBE Model**

To examine the perceived usefulness of our annual UnConference and other oCUBE activities/resources in supporting an engaged CoP and the life-long learning of oCUBE members, we surveyed the oCUBE members. A request to participate in an online survey was sent to all 60 individuals who regularly receive the oCUBE newsletter (including the authors of this paper). The survey consisted of ten questions and used a Likert-type scale. Participation in the survey was voluntary and only pooled data was analysed to preserve anonymity.

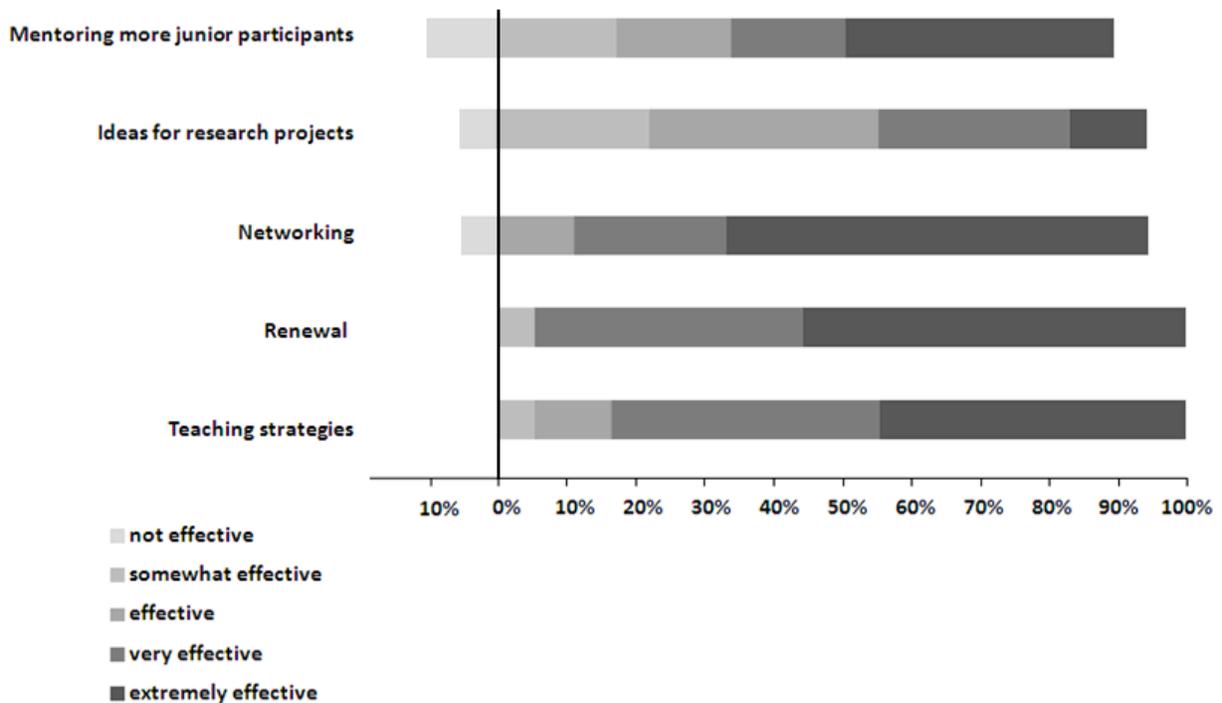
Of the 23 oCUBE members who participated in the survey, almost 70% have taught at the university/college level for six or more years. Respondents are active in oCUBE, reporting that in the past year they had attended the UnConference (61%), participated in online meetings (39%), read the newsletter (87%) and/or engaged in informal email consultations with other members (76%).

Participation in oCUBE was either ‘very’ or ‘extremely useful’ in helping the respondents improve their teaching practice (65%) and in fostering their professional development (65.2%) (Figure 1). These results are remarkable given that the majority of respondents are experienced teachers (six or more years), indicating that oCUBE is succeeding in promoting members’ life-long learning.



**Figure 1** *oCUBE participation helps improve teaching practice and fosters professional development of survey participants* The percentage of participants selecting one of five responses (Likert-type scale) to statements related to the usefulness of their oCUBE participation in helping improve their teaching practice and in promoting their own professional development and the professional development of others is shown.

Most of the survey participants were enthusiastic about the UnConference reporting that it was ‘very’ or ‘extremely’ effective for renewing the respondents enthusiasm for teaching (94.5%), for networking (83%), and for providing new ideas for classroom/course strategies (83%) (Figure 2). When compared with a traditional teaching conference, respondents rated the oCUBE UnConference as ‘more’ or ‘much more effective’ in all areas surveyed including networking (94%), renewing enthusiasm for teaching (88.3%), providing new ideas for teaching strategies (59%), generating ideas for research projects (64%), and mentoring more junior participants (76%).



**Figure 2** *Effectiveness of the oCUBE Unconference in promoting key meeting outcomes*  
 Participants were asked to rate the Unconference in terms of its effectiveness in five outcome areas using a five-point, Likert-type scale.

## Conclusions

As educators, we deal with many common teaching challenges. oCUBE helps us address these challenges by providing support and a mentorship network of educators eager to share and discuss all aspects of teaching and professional development. oCUBE members report the constructive ideas and feedback they receive from other members regarding teaching ideas is particularly valuable in helping them in the classroom and in their professional lives. We believe that the oCUBE model that has been developed is broadly applicable and can be used by educators in any discipline or by any other group of like-minded individuals wanting to establish an effective collaborative network for professional development.

## Acknowledgements

oCUBE is a collaborative team and its members (<http://ocube.wikispot.org/People>) have made significant contributions to the inception, development and/or maintenance of oCUBE and its activities and resources.

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## Biographies

Please refer to the Ontario Consortium of Biology Undergraduate Educators (oCUBE) Wiki  
<http://ocube.wikispot.org/People>