

International peer review in undergraduate dentistry: enhancing reflective practice in an online community of practice

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Abstract

To stimulate and enhance student learning in the areas of global citizenship, critical reflection and e-learning, an online international peer review using a purpose-built web platform, has been developed between international dental schools. Since its inception in 2007, $n = 6$ dental schools from six different countries have participated with $n = 384$ dental students engaged in online peer review. Project development was conceptually analysed utilising Lave and Wenger's notion of a community of practice (CoP). Analysis drew on the three core components within the CoP organising framework: domain, community and practice. All three components were evident in building project identity. The domain focused on both curriculum and institutional co-operation. The community was evident for both educators and students. Finally, analysis of practice was found to be significant in terms of sustained interaction and collaboration. Empirical evaluation is recommended as the next phase of project design.

Introduction

When professional schools such as medicine and dentistry merged with research universities, the curriculum sought to teach students to approach problems through a biotechnical lens and then apply this to the clinical setting. The rationale was that academic research provided scientific knowledge that could be applied to the real-world situation. This approach has been challenged by e professional communities, particularly with respect to the reflective practice movement (1). Reflection is seen as one cognitive approach that may be able to move curriculum further by allowing students to develop the skill set to think through a problem at hand rather than trying to apply set answers to set problems (2). In response to this, one of the overriding goals for dental education is to develop and enhance reflective practices in dental students (3). Such reflective skills are known to result in practitioners who not only ensure they are up to date with the latest developments in oral health care but are also more empathetic dentists (4, 5). Although methods such as peer review are recognised as powerful educational tools allowing students to embrace change and improve their knowledge, attitudes and

skills, some students have difficulty applying reflective practices in their studies (6).

Change is also occurring in professional peer interactions with a rapid uptake in the use of social networking. This increase in social networking as enabled by sophisticated technology now allows people to communicate on several levels via the Internet be it through PCs or, increasingly, through mobile devices. However, social networking is not without its problems when employed in curriculum innovations. Educators have faced problems with, for example, students uploading unprofessional content into open areas of their web pages (7–9). It is recognised that students who use social networking are often looking for guidance, but do not necessarily receive it from their teachers who view such technologies from a different perspective (8). Other social media tools such as blogs have been used in medical education and are seen as a useful form of reflective practice with learners quickly adapting these communication tools for educational purposes if the interactions are structured and led by the teacher (10). Online discussion groups prove popular with students especially if they are driven both by the learner and teacher in a blended approach to distance learning. (11). There is therefore a tremendous potential

with online discussion, but it requires educator and support staff development. Students enjoy using this form of online communication and the social networking that it brings, but the challenge is to bring higher levels of learning and critical analysis into the discussions (12).

One approach to this challenge is to bring students together to work in a learning community known as a community of practice (CoP). The original progenitors of the Communities of Practice movement situated their work closely to social theories of learning processes, specifically situated learning with a focus on the participatory process involved in communal learning (13). A CoP should, therefore, not be considered as a static entity but rather as dynamic with the knowledge and activities generated within the CoP being under constant reconstitution by its members (14). Central to this group-process view of knowledge-building is the concept of legitimate peripheral participation whereby a learner acquires new knowledge through engagement with senior members of the group (14). In the two decades since Lave and Wenger's first introduction of this concept to education, interest in the concept has particularly grown in two educational areas; these are the building and sustaining of knowledge communities in business management (15), and in the development of online environments, often referred to as knowledge management (KM) (16). A CoP has three constituent elements: domain, community and practice, which are dynamically interrelated. For educators, the question is how to develop these elements in parallel to cultivate a learning CoP (13).

In conceiving this project, educators recognised that whilst students may discuss matters primarily within their own educational establishments, many have the opportunity to interact with students both within and out of their own country in the later years of the curriculum. Such internationalisation initiatives are already well established with many health-related curricula offering elective study periods where students visit overseas organisations (17). A question for curriculum designers was how to incorporate the benefits of internationalisation into the earlier years of the curriculum without the burden of out-of-country visits. A logical solution was to mix social networking media, such as blogging, with common curriculum experiences such as simulated operative exercises.

The aim of this study is to reflect on 5 years of a collaborative global dental education project known as the International Peer Review (IPR) project. Our study includes information on the background of the project together with a consideration of the emergent role of social networking in dental education and is intended to be the first in a series describing the groundwork for implementation and the initial challenges and rewards in the development of this project. The project's development is analysed against the framework provided by CoP theory (Refs – currently 13, 14), and future manuscripts of the emerging themes will be explored to determine the outcomes.

Background: the international peer review project

The IPR project was created following a Universitas 21 conference in Hong Kong in 2007 (18). The lead institution was the University of British Columbia (UBC), which was developing an ePortfolio project based on an undergraduate operative den-

tistry clinical simulation. The faculty team at UBC took the next step of facilitating the exchange of student work with other international schools via a blog. The project was designed to create a learning exchange with students based on the subject of operative dentistry pre-clinical simulation. Dental faculties, which included universities from the U21 network (18), were included in the first iterations of the IPR. Participating schools to date include:

- University of British Columbia (UBC).
- University of California San Francisco (UCSF).
- University of Melbourne (UM).
- University of Birmingham (UB).
- The University of Hong Kong (HKU).
- Technologico de Monterrey.

A common assignment was developed for students who were in their first simulated operative learning class. At this level, students were asked to prepare a case presentation in either a Word document or with PowerPoint slides that would be suitable to present to a colleague. The subject consisted of Class I, II, III or V preparations and restorations on a dentoform. An example from UBC can be found at this link: <http://www.dentistry.ubc.ca/download/peerreview>.

Their work was then exchanged with their international peers. Students were grouped into dedicated learning communities (three to four individuals) for the exchange and critique of case presentations. The project took place on a dedicated specialised web platform (19). This platform enabled the dental students to become part of a learning community whilst maintaining a reserved space for uploading their assignments and communicating privately with their teachers. Some faculty elected to use this private online space for reviewing drafts and assessing final assignments whilst others undertook this offline.

Each participating school had their own assignment rubric, and all schools formally briefed students beforehand, outlining the project's key aims and anticipated learning outcomes as they related to the core areas of global citizenship, operative dentistry, critical reflection and tech-savviness. At UBC, the learning exchange was marked according to the rubric presented in Table 1 with the learning outcomes identified as: communication, accountability, teamwork, evidence-based practice, and feedback and reflection. All the rubric's criteria were used to assess each student's demonstration of global citizenship and technical ability to work in a digital learning community. The same rubric was also used to assess IPR effectiveness as a learning tool. Third-year students participate fully whereas 2-year students participate in a limited role mainly observing and making a few comments. To date, 384 students have participated in this project.

Analysis: IPR as a community of practice

The concept of 'CoP' rapidly moved from educational theory in the 1990s to its current generic applications across fields. The genesis in educational theory is attributed to the work of Jean Lave and Etienne Wenger (13, 14) who characterised three core elements of a CoP as 'domain', 'community' and 'practice' (20). In reflecting on the development of the IPR project, we elaborate on these three key features that, when considered in interaction with each other, are the hallmark of a CoP.

TABLE 1. University of British Columbia International peer review learning outcomes and marking criteria

Learning outcomes	Marking criteria
Communication	Shows interest, engages Summarises points Corrects misinformation
Accountability	Respectful – responds within 2 days Answers all questions presented by the learning community
Teamwork	Respects self and others Supportive and encouraging – is not dismissive in replies
Evidence-based practice	Extracts information from different sources Always and appropriately cites sources of information Critically evaluates any conflicting information by presenting own reasoning Challenges information
Feedback and reflection	Provides kind, constructive feedback to others Accepts and acts on reasonable information Proposes strategies to achieve goals

Domain

It is argued that the ‘shared domain of interest’ acts as an identifying force for the CoP (20) with membership implying ‘a commitment to the domain, and therefore a shared competence that distinguishes members from other people’. As described in Table 2 below, the IPR project can be seen as holding a distinct identity as per Wenger’s notion of ‘domain’ both in terms of student and faculty affiliation to the CoP. The community was established based on the level of surgical training in operative dentistry simulation. All the students in the operative clinical simulation course had little to no patient experience in any dental disciplines. Originally, the case presentations were simple composite or amalgam restorations. However, once familiar with the task and online modality, students in ensuing years requested

TABLE 2. International peer review as domain

Features of a DOMAIN	International peer review project
Identity defined by shared domain of interest	Operative Dentistry: simulated clinical skill development
Membership implies commitment	Faculty: Universitas21 Dentistry group members/grant Students: goal to meet professional qualifications
Shared competence as a distinguishing feature	Students: operative skills; clinical photography; academic dentistry; critical reflection; global citizenship Faculty: operative techniques; educational methodologies
Value collective competence and learn from each other	Faculty network: sharing educational and clinical expertise Student network: critical, supportive peer review

inclusion of more procedures to enhance interest and support discussion of a wider range of topics.

Originally, in an attempt to respect each participating university’s autonomy, the concept of commitment was addressed independently. One component of UBC’s mission statement is that students ‘will acknowledge their obligations as global citizens’ (21), and this formed the focus of the UBC project. It became necessary to remind students that this was a global citizenship project, as students tended to regard the project solely as a tool for improvement of their operative skills, although clinical skills’ improvement through participation in these communities did remain a major learning outcome. The following communiqué to students from UBC faculty illustrates this point:

the objective of this project is to become more comfortable with global citizenship – working with dental colleagues from different parts of the world and from different cultures – this is not a clinical project

Analysis of the domain features of the IPR as described in Table 2 indicated that the CoP supported formation of a specific IPR identity for both educators and students.

Community

In the CoP framework, ‘community’ is defined as the relationships between the members and the sense of belonging (20). As described in Table 3, the IPR can be viewed as building collaboration for learning. It was observed that students were understandably focused on their in-house assignment preparation, schedules and the operative skills’ methods they were taught. Preparation for the online peer review phase focused on both evidence-based dentistry and professional conduct in a global forum. At UBC, it was emphasised to students that as global citizens, they were required to respect others’ commitments and try to understand the rationale for a method that differed from what they may have been taught, as illustrated in the following communiqué to the students:

your presentation is not for a professor but a rather a peer therefore, it is required to make it professional but also add warmth or be more informal. For example instead of saying this is how and why it is done you may say at UBC we are taught to..... which is supported by..... (citation). Is this similar to what you are taught? I was wondering what your thoughts are on the subject of.....

Of significance to this project was the clarification that a website alone cannot constitute a CoP. By this definition, it is only when ‘the members interact and learn together’ that the virtual group can be considered as a community (20). As evident in Table 3, the project developed the larger IPR community as well as a subset of contributing communities such as the small group of faculty working on project development. The relationship building for the IPR community occurred in various modalities, both face-to-face and online.

For project leaders, an international faculty face-to-face meeting was held in June 2009 to address emerging issues. Of prime concern was the timing of the learning exchange between the students. Each participating school has their own curriculum with the students participating in the operative course at different times of the year. Eventually, a whiteboard was used to position each school’s timetable resulting in a 6-week win-

TABLE 3. International peer review as community

Features of a COMMUNITY International peer review project	
Members engage in joint activities, help each other and share	Faculty: project development/website design & ongoing review Students: blog – share ideas and resources
Build relationships that enable them to learn from each other	Faculty: annual face-to-face & web conference meetings Students: profile and letter of introduction (professionalism); blog – local contexts and ‘ways of doing’

dow between January and mid-February that could accommodate every school’s needs. Figure 1 is a table depicting how the whiteboard was used to determine where the IPR learning exchange should be placed. The chart shows the area where there is an overlap in the curriculum time for a learning exchange.

Participant affiliation to the project was, therefore, enhanced through joint engagement in a collaborative learning enterprise (Table 3) that supported the establishment of a ‘community’.

Practice

The third CoP element of ‘practice’ is considered in terms of ‘shared practice’. Members of the community are practitioners sharing a ‘repertoire of resources: experiences, stories, tools, ways of addressing recurring problems’, which may or may not be a self-conscious process (22). Practice, therefore, reflects the community’s growing and evolving body of domain-relevant knowledge, skills and values. Table 4 describes practice-related areas on which the project has expanded.

Faculty’s core role was facilitation, by providing an educational presence making students aware that the blogs were

being accessed on a regular basis, by seeding concepts through guiding questions in the blogging, and by discussing inappropriate dialogue should it occur. To date, minor problems such as the posting of non-professional pictures have occurred, but have been dealt with easily. Otherwise, students have participated in a collegial manner.

Shared repertoire of practice between participating faculty is emerging with sharing of concepts between wider educational theory and dental education. For example, the concepts of CoP and community of inquiry (23) have emerged during the course of our work and have provided conceptual frameworks for our research, teaching, presentations and publications. Recently, three participating faculty from three different universities hosted a faculty workshop at the 2011 American Dental Educators Association (ADEA) annual conference entitled ‘Global Digital Learning Communities: Learning or Social Networking?’

Student self-development has emerged as well. For example, students from UCSF independently began to produce YouTube™ videos to demonstrate their proficiency in operative clinical skills linking to these videos from their case presentations; skypeing has also evolved as a communication form between students, between faculty and students (from other universities), and between different universities during group presentations.

As reflective practitioners engaged with project development, we found these theories were useful in further conceptualising and implementing the IPR project. Although the distinction between domain, community and practice has been useful in structuring the discussion and reflection above, one must reiterate that it is the.

‘combination of these three elements that constitutes a CoP. And it is by developing these three elements in parallel that one cultivates such a community’ (19)



Key

UCSF	University of California, San Francisco
HKU	University of Hong Kong
UBC	University of British Columbia
UM	University of Melbourne
UB	University of Birmingham

Fig. 1. Each of the participating schools had a 4- or 5-year curriculum (represented on the left) with the operative dentistry simulation course taught in different years. The whiteboard exercise sought to find an overlapping time when the students could participate in the learning exchange. The curriculum overlap is indicated by the black rectangle.

TABLE 4. *International peer review as practice*

Features of a PRACTICE	International peer review project
Members are practitioners	Faculty: dentists; curriculum developers Students: apprentices in dentistry; simulated operative techniques; and professional communication
Shared repertoire of resources	Faculty: academic philosophy; learning outcomes; structure of learning experiences; assessments Students: operative techniques; personal experiences; references
Sustained interaction	Faculty: 5 years+ Students: annual cohorts with 6 weeks of intensive blogging
Development of a shared practice	Faculty: evaluation; review, ongoing development; funding Student: professionalism

Conclusion

Adopting a CoP framework for analysis of the development of the International Peer Review (IPR) project has clarified many of the contributing factors that supported the development of a collaborative educational innovation. The analysis presented above indicates that the IPR is a CoP with a clearly identifiable domain that has been developed and sustained over time through the practices of members of its community, both dental educators and their students. Rewards have been great with students developing an appreciation for the quality of their education, engaging with the concept of establishing a global presence, and appreciating that dental education is quite similar between schools, despite contextual variations. Challenges are few but vary between universities. For example, educators at one school encountered reluctance on the part of some students to participate during the 1st-weeks of online blogging, whilst educators at another school found it difficult to recruit individuals from other dental disciplines to develop parallel spaces within the platform. This is a work-in-progress for participating faculty, and we are grateful for social media, which enables us to 'get-together' to work on global solutions for local challenges.

Formal empirical project evaluation is underway both within and across institutions. Themes emerging from our qualitative work, such as increased awareness of global citizenship, the ability to communicate in a professional manner with colleagues and increased tech-savviness, will be further investigated with quantitative analysis. In addition, we aim to survey recent graduates to determine whether this project has been beneficial to them in their lifelong learning.

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