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Accelerating Educational Innovation in the MPH Degree Program: What is the Role of Peer Review of Teaching?

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ABSTRACT

Purpose*: The environment of public health practice is rapidly changing, creating the need to adapt graduate education and accelerate educational innovation. Formative peer review is a strategy designed to promote critical reflection on teaching and to develop faculty as teachers. Through case study methods, we explore how peer review of teaching may catalyze reflective practice and contribute to the redesign of public health education.* ***Methods****: We conducted a detailed contextual analysis of a peer review of teaching program implemented from 2011-2014 in a global health department with approximately 200 students and 26 teaching faculty. The case study used multiple data sources including peer review feedback reports, a survey of participating instructors and reviewers, and administrative data.* ***Results****: Faculty had favorable attitudes toward peer review, especially the opportunity to learn by observing others teach. Peer review reports confirmed existing good teaching practices and suggested ways to improve student engagement and develop teachers in ways which are aligned with MPH program redesign goals. Both peer reviewers and instructors reported benefiting from the process.* ***Conclusions****: Formative peer review may help to spread innovative teaching practices among faculty by providing opportunities for reflection, increasing motivation and confidence to adopt pedagogical changes, and strengthening teaching community. Increased knowledge of other teachers' courses and social ties created through peer review can be resources in promoting MPH curriculum integration and collaboration across disciplines.* ***Recommendations****: Schools of public health should consider peer review of teaching as a pathway to promote greater student engagement and practice-based learning. In planning for peer review of teaching programs, leaders need to find ways to address time-related concerns and align the peer review process with other efforts to promote program redesign goals and strengthen teaching community.*

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INTRODUCTION

The curriculum for the Masters of Public Health (MPH) degree program is undergoing significant changes. In 2011, a task force of the Association of Schools and Programs of Public Health (ASPPH) studied the role of public health education for the 21st century (Petersen & Weist, 2014). The task force emphasized the need to adapt education to a rapidly changing environment in public health practice and to accelerate educational innovation. The skills which students of public health need are interdisciplinary, interprofessional, and systems oriented (Frenk et al., 2010; MPH Expert Panel of the Framing the Future Task Force, 2014; Petersen & Weist, 2014). They reflect work-force competencies from the core disciplines of biostatistics, epidemiology, health policy and management, environmental health sciences, and social and behavioral sciences in addition to cross-cutting skills in communication, change management, informatics, political and cultural sensitivity, and leadership (Bernstein, Jonson, & Smith, 2000; McKee & Tew, 2013). The new focus on applied learning and integration was expected to require major changes in teaching (Frenk, Hunter, & Lapp, 2015).

Research supports the assumption that the quality of teaching affects student learning, and continuous development of faculty as teachers is critically important to successful education redesign (Bernstein et al., 2000; Clayson, 2009; McKee & Tew, 2013; MPH Expert Panel of the Framing the Future Task Force, 2014). To achieve the goals proposed by the ASPPH task force, course design and teaching must change in ways that promote student engagement and practice-based learning to build competencies in public health, with more time devoted to applying skills such as data analysis or critical reasoning, and practicing communications and leadership (Brame, 2013; Frenk et al., 2015; Fulton, 2013; Herreid & Schiller, 2013). Yet to date, most of the literature on redesigning the MPH has focused on curriculum choices (what to teach) rather than teaching methods and professional development of teaching faculty (how to teach).

Peer review of teaching (PRT) is one method of promoting professional development of teachers, encouraging reflective practice, and motivating faculty to teach from a different perspective (Thomas, Chie, Abraham, Raj, & Beh, 2014). PRT is defined as "informed colleague judgment about teaching for either fostering improvement or making personnel decisions" (Chism, 2007). Formative PRT programs are designed to develop faculty members' self-awareness and provide teachers with information and an opportunity for critical reflection to improve their teaching practice, while evaluative PRT programs seek to compare teaching to standards to make judgments related to hiring, promotion, tenure, or salary review (Chism, 2007; Thomas et al., 2014). PRT can help teachers reflect on weaknesses and build on teaching strengths, select teaching methods that can best meet the goals for a course, develop more practice-based exercises and assessments, and integrate technology into the classroom (Carter, 2010; Kohut, Burnap, & Yon, 2010; Thomas et al., 2014; Yon, Burnap, & Kohut, 2010). Faculty peers may be better qualified than students to assess the appropriateness of course objectives, quality of course content, whether important points are being emphasized, and the aptness of examples used in class (Courneya, Pratt, & Collins, 2008; d'Eon, Overgaard, & Harding, 2000; Nelson, 1998). The Harvard T.H. Chan School of Public Health includes peer review of teaching as a component of their new educational agenda, suggesting that it can be a vehicle to adapt the values of collaborative, team-based research to the teaching enterprise (Frenk et al., 2015). Yet, little is known about the application of peer review of teaching in the context of MPH education. Implementation of PRT programs in other disciplines has proven challenging because the goals and format must be adapted to institutional context, including the department's mission, values, student demographics, resources, and faculty disciplines (Chism, 2007; Quinlan & Akerlind, 2000). Other obstacles or barriers to successful program operation include fear on the part of the instructor being reviewed, uncertainty about what to review, resistance to innovation that involves participants doing more work, and implementation factors such as how reviewers are chosen, power differentials, and the amount of guidance or flexibility built into the process (Costello, Pateman, Pusey, & Longshaw, 2001; Courneya et al., 2008; Frenk et al., 2010; Kell & Annetts, 2012; Thomas et al., 2014). We examine issues encountered in using PRT to help faculty in one department reflect on teaching practice, and explore what role PRT might play in accelerating educational innovation

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in MPH programs across departments and schools of public health.

PURPOSE

The purpose of this study is to explore how a global health department at a major school of public health implemented PRT in conjunction with MPH curriculum redesign, in an effort to improve teaching which would reinforce competency-based learning. The study documented the views and perceptions of faculty about the PRT process, the types of feedback and observations gleaned through PRT, and the challenges in carrying out the program. The insight generated from this study may help envision the role of PRT in promoting innovation in MPH education, and inform the design and implementation of PRT across departments and in other public health institutions.

Background on the Peer Review of Teaching Policy and Process

The Department of Global Health (GH) admits 90-110 new MPH students per year. Full-time students generally can complete coursework in three semesters including a practicum experience. The Department adopted a PRT policy in December 2010. While the number of faculty in the department varies over time, the department generally has 24-26 teaching faculty in a given year, and 6 research faculty. Teaching faculty are expected to teach at least 8 credits as well as doing research, while research faculty are primarily engaged in research and are not required to teach, though they may offer to teach a course in exchange for salary coverage. As the School of Public Health does not have tenure, all faculty are non-tenured.

Implementation of peer review of teaching coincided with a school-wide redesign of the MPH curriculum started in 2011. The goal of this redesign was to provide graduates with the knowledge and skill sets needed for employment, and to assure that the program was adapted to the changing context in which public health is practiced. As many students were coming straight from undergraduate studies without much work experience, the redesign aimed to increase applied learning experiences to simulate work settings. Ideally students would be spending less class time listening to lectures and more time practicing the application of public health skills with the instructor as mentor and coach. Five task forces were created at the school level to promote the programmatic changes: core curriculum, concentrations, practicum, culminating experience, and teaching methods and assessment. The teaching methods and assessment task force called for competency-based learning to promote skills which would improve students' job-readiness, and highlighted the need to develop faculty and provide them with support for pedagogical changes.

The primary objective of GH's peer review of teaching policy was to improve the quality of teaching. PRT was intended to affirm the importance of teaching, encourage innovation and improvement in teaching methods, and encourage sharing of teaching techniques. It was seen as a form of collaborative analysis that would help individual faculty to develop as teachers while reinforcing their commitment to teaching. Excellence in teaching would in turn improve the competencies of MPH graduates, especially in light of the move toward competency-based education. A second objective of PRT was to enable GH faculty to understand the courses taught by other faculty members so that faculty could become better advisors, more successfully matching students with course offerings that fit their needs and interests. Finally, the department hoped that PRT would help to create a stronger professional community in order to resist the centrifugal tendencies which are inevitable as faculty members pursue individual career goals and funding opportunities (d'Eon et al., 2000).

PRT process

The process was designed so that teams of two faculty members observe each course assigned for review. In fall and spring semesters, the Chair or his/her designee develops a list of courses to be reviewed. Every course is not reviewed every semester, and reviews are not conducted in summer to ease the burden on faculty. Typically a course will be reviewed every 2-3 times it is offered. The Chair or designee assigns faculty teams to review the courses. Factors considered in selecting reviewers are the background and strengths of reviewers and how they may be helpful to the instructor, and the reviewers' ability to benefit from the review by gaining ideas for their own courses. Over time, review teams are exposed to many different courses. Given the inter-

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disciplinary nature of global health, reviewers often do not have content expertise in the topic of the course being reviewed. This is not seen as a problem, as the goal of PRT is to improve and share teaching methods, and to provide opportunities for collaborative reflection on teaching. Peer review teams are encouraged to meet with the instructor before observing the class. During this meeting they discuss specific aspects of the course the instructor may want to focus on, and review the course goals, syllabus, and teaching and assessment methods. This is meant to provide context for the observation and to help the reviewers see how the session to be observed fits into the instructor's overall plan. Before conducting the observation, reviewers may also examine other materials related to the course including the course web site, e-portfolio site, or past student course ratings.

Review teams schedule a time to observe the class. The team is expected to attend one (generally 3-hour) class session and to review the materials for the class. Given travel schedules for GH faculty, sometimes reviewers split up and review different sessions of the course. Following the review, the review team is expected to prepare a brief memorandum summarizing impressions and suggestions. This document is shared with the instructor, and the reviewers and instructor meet to amplify or clarify the comments. The memorandum is then submitted to the faculty chair who reviews to identify and prioritize resources to support changes in the course or skill development for the instructor. The review does not become part of the faculty member's personnel file, nor is it used for annual performance review. Peer review tends to be more effective when the process is flexible and owned by the participating faculty (Thomas et al., 2014). To encourage ownership, guide questions and an optional rubric are provided as possible tools, but the review teams can decide which tools they want to use. The optional guide questions and rubric focus on aspects of course organization, clarity of content, interaction in the classroom, lecture style, discussion management, use of media, and exercises or projects to promote applied learning.

METHODS

We applied case study research methods to provide a rich description of how the PRT program is operated and was perceived by faculty. The time period examined was January 2011 to May 2014 (7 semesters). A combination of data collection methods is well suited to understand the relationship between organizational behavior and its specific context (Hartley, 1994). Administrative data sources included the school's registrar office records (courses offered by the department within this period, and the instructors who taught the courses) and records from the department curriculum coordinator's office (courses assigned for review each semester, assigned reviewers, number of reviews which actually took place, and availability of review memos). In addition, we used the peer review memos to determine the number of sessions observed for each course, and to help determine which faculty members assigned to the review actually participated. We also reviewed the content of all written peer review memos submitted during the study time period to elicit themes.

To complement the administrative data and peer review memo information, we conducted an anonymous survey of GH faculty using Qualtrics® online software. The survey was sent to 26 full-time teaching faculty with regular appointments. The survey was sent in January 2014, and the recall period was 2013. Faculty answered questions about the time spent in the peer review process, knowledge, and attitudes or opinions about the program. The knowledge, attitude, and opinion questions were evaluated on a 5 point Likert-like scale (1=strongly agree, 5 = strongly disagree). Knowledge of the policy was probed with two questions: "The department uses peer review feedback in the faculty performance review and planning process," and "The department uses peer review feedback in the curriculum revision process." We asked three questions about usefulness of peer review, including "PRT helps me learn new methods of course design, teaching, or assessment," "PRT increases my knowledge of course offerings," and "PRT helps me to get to know other instructors better." Finally, we asked opinion questions to probe whether the reviewer thought the instructor had found the feedback helpful, and whether the instructor found the reviewer's feedback helpful. We did not ask any demographic information in order to protect confidentiality.

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Analysis

Administrative data were analyzed in an Excel spreadsheet. We calculated total and average per semester for: courses offered; courses assigned for review; reviews which actually took place; reviews for which a written memo was available. We also calculated the average number of reviews per course; average number of reviews per teaching faculty member; average number of sessions observed per review; and proportion of faculty assigned to review who actually participated. We summarized average length of memos, and the proportion of memos which used an evaluation rubric versus narrative style.

The content of peer review memos was analyzed using a modified grounded theory approach (Corbin & Strauss, 2008). Our analytical strategy involved constant comparison, i.e. looking at observations and recommendations contained in each memo, and comparing it with observations and comments in other memos for similarities and differences. Segments of text which were found to be conceptually similar were grouped together under higher-level descriptive concepts (Corbin & Strauss, 2008). The lead author, who is an experienced researcher trained in qualitative methods, read each memo and entered sections of text into an Excel spreadsheet. These segments of text were then analyzed and assigned codes to indicate different descriptive themes (Miles & Huberman, 1994).

Survey data were analyzed in Excel. Data were stratified by reviewers and instructors where necessary, and described using proportions and averages.

Institutional Review Board Approval

The study was reviewed by the university's Institutional Review Board and found to be exempt because it does not meet the definition of human subject research.

Informed Consent

The survey used for the study was anonymous and responding to the survey was optional. We used de-identified data for this study and therefore we could not obtain informed consent of study participants.

RESULTS

Administrative Data

Twenty-six faculty participated in the PRT program as a reviewer for at least one semester with 11 faculty participating as reviewers 3 or more times between 2011 and 2014. Each faculty member reviewed 2.5 courses on average. The GH department offered 19 courses and scheduled 9 peer reviews per semester (47%) on average.

Over the 7 semesters, 28 unique courses were offered and all were scheduled for at least one review. Core courses with sections taught by different instructors were often scheduled for review multiple times. Of the 62 reviews scheduled, written memos were available for only 37 (60%), and verbal feedback was given for an additional two reviews (3%). It is assumed that the remaining 23 scheduled reviews (37%) probably did not take place due to scheduling problems or travel. This means that of the 28 courses scheduled for review, 4 (14%) were never reviewed, 13 (46%) were reviewed once, 9 (32%) were reviewed twice, and 2 (7%) were reviewed three or more times. On average each unique course was actually reviewed 1.3 times with written results.

Some courses scheduled for team review were actually reviewed by only one faculty member. On average, 85% of faculty who were assigned to a reviewed course contributed to a review memo, and review teams observed an average of 1.3 sessions per course. Review memos were generally 1-3 pages long. Eight memos (22%) incorporated an optional rubric which rated class organization, lecture style, exercises, student engagement, etc. as "excellent", "good", or "needs improvement," while the remaining review memos used narrative style. All review memos included a summary of observations and suggestions.

Review Memo Content

Reviewers provided comments on topics including the syllabus, choice of teaching methods, classroom management, lecture skills, and discussion management. Feedback depended on whether the instructor had specific goals which he or she wanted the reviewers to consider; for example, one instructor asked for reviewers' recommendations for how students could become more engaged during class sessions while another instructor was interested

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in better ways to evaluate group projects. Feedback on content was offered if the reviewer had related expertise, such as an infectious disease doctor reviewing a course on controversies in global disease control and eradication. Recurrent themes in the peer review feedback included: active learning, making connections between course objectives and activities, and teaching techniques.

Active learning

Reviewers gave praise and constructive criticism to instructors to enhance active learning and student engagement, as shown in these quotes: *"The session was a great example of the "inside out" organization of teaching where the students are actively engaged in learning. Work outside the session (watching video lectures, preparing their own group's consulting assignment, reading another group's report) made it possible for this session to be so active. During class, groups of students evaluated another group's report on a drug management issue, and prepared and gave a 10-minute presentation with the findings of their evaluation." "[In this session,] student groups had designed active-learning strategies to convey nutritional messages. Each group had just 5 minutes. One group did a charades game, another used a polling software to survey class participants through text messaging, a third group had written a song with nutrition messages in the lyrics…the students seemed happy and engaged."* Active learning sometimes involved individual activities such as students filling out a worksheet or team activities (presentations, group projects) inside or outside the classroom. One reviewer acknowledged a faculty member's innovation in incorporating tweeting into the classroom while also questioning how to evaluate the impact of tweeting on educational outcomes. Other reviewers suggested strategies such as pair-shares, "clickers" (audience response system), "minute papers" (a classroom assessment technique to get rapid feedback on a main idea introduced in the session), and structured discussions to further engage students.

Connections and context

Another theme of reviewer comments was helping learners see connections and understand the context in which course concepts can be applied in professional practice. Reviewers praised instructors for using techniques which put the session in the context of the overall course goals. They also suggested additional readings or perspectives connecting other disciplines: for example, a professor with a humanities degree, after reviewing a course session on vaccine refusal taught by a medical doctor, ruminated that John Stuart Mill would ultimately come down on the side of compulsory vaccination without exclusions because not vaccinating compromises the health and liberty of others. The reviewer supplied a lengthy quote from Mill's book *On Liberty* to support this argument.

Frequently, reviewers observed ways in which the instructor could make explicit the connections between sessions, summarize key points, or anticipate what is coming next as in these quotes: "*It might be good to introduce the readings for the day by saying how or why they were chosen, or what the students are meant to get out of them. Are they linked in any way; an overarching theme?"* "*I don't usually subscribe to the philosophy that one needs to hit students over the head with the course objectives, but it might have helped [if you would] place the discussion in the overall context of the course and give objectives for the lecture."*

Teaching styles and techniques

Reviewers observed ways in which the instructor set up the classroom to enable active discussions, intervened to prevent domination by vocal students, and used techniques such as randomly picking students to lead discussion as a way to motivate students to be more prepared and therefore more able to actively participate. Reviewers mentioned ways to widen participation, suggesting techniques such as coaching student discussion leaders and preparing discussion questions in advance.

Reviewers gave feedback on systematic organization of lectures, confidence and command of material, the instructor's voice and enthusiasm, and the preparation of slides. Reviewers liked when instructors integrated examples and experience into lectures, as shown in these quotes: "*One of the most effective elements was when the instructor turned the lecture from conceptual to the specific by integrating data from recent scientific publications which were thematically linked to the student projects." "The instructor spoke from experience, probably the greatest strength of the class. It really addresses, 'what is it like to work in the field?'"* Many reviewers made suggestions

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about how to design better presentations, use questions more effectively, and wait an adequate amount of time for students to answer.

Other themes

Reviewers often commented on themes ripe for deeper discussion among faculty, such as whether instructors should 'cold call' on quiet students, the appropriate role of teaching assistants in lecturing, whether to allow re-submissions of work for a higher grade, how to assure individual accountability in group projects, and what to do about students who are web surfing or emailing in class. While reviewers acknowledged the complexity of these issues and there is likely no one right way, they would often mention their own preferences as these reviewers did on the topic of grading: "*I wonder if students will be happy doing so much [group] work and getting few individual grades, but that may just be my prejudice against group projects. I didn't like them as a student and did not find them useful when I tried them as a teacher." "If we are really interested in the intellectual growth of our students …then we would want to encourage them to redo work, continue to practice, and if that produces a better product, reward them accordingly."*

Survey Data

We received responses from 19 of 26 GH faculty surveyed (73% response rate). Fifteen (79%) of the respondents had participated in PRT in 2013. Where reviews were not completed, faculty explained reasons including scheduling problems (being asked to review a course that met when the reviewer was teaching), international travel, and "running out of time" or forgetting. Reviewers reported spending a median of 4 hours while instructors said they spent 0.5 hours on the peer review (instructors did not count the time being observed, as they would have been teaching anyway).

Most of the faculty surveyed said that when they had reviewed a course, they had met with the instructor, reviewed the syllabus, observed a session, and shared written feedback with the instructor afterwards (Figure 1). Less common peer review activities were talking to students to get their feedback and reviewing the course web site or past course evaluations which are available to all faculty and students online. In one case, a pair of reviewers had conducted an online survey to get student feedback.

About three-quarters of instructors believed that peer review was important for faculty development and 44% of instructors reported they had already made changes in course design or teaching based on peer review feedback. Faculty shared their positive perceptions, as in these quotes: "*I think this process helps knit the department together." "I highly value peer review. I've made changes based on comments from previous reviews." "I enjoyed having my colleagues in the classroom. I always ask them to participate and that adds a nice new voice to the session."* Other faculty voiced doubts about the usefulness: *"[The usefulness] depends on the feedback provided. Teaching styles vary and not all recommendations are helpful." "The reviewer came—but so far has not responded to request for feedback."* Fifty-three percent of instructors thought peer review of their course was worthwhile or very worthwhile.

Attitudes toward peer review suggest that the reviewers gain as much if not more from the peer review process as the instructor whose course is being reviewed (Table 1). Almost three-quarters of reviewers said that conducting peer review helped them to learn new design, teaching and assessment methods. Reviewers also said they gained knowledge of the range of course offerings in their department and got to know other faculty better through the peer review process, as these quotes suggest: "*I enjoy doing the reviews. I especially like meeting with the instructors ahead of time and finding out what they like or are worried about in their courses. I like to see how other instructors structure their courses." "I value the opportunity to learn from my colleagues and offer feedback. While it can be hard to fit in our busy schedules, it's always worth it."*

Some respondents didn't know how their feedback had been perceived or suspected that the feedback they gave to instructors was not welcome. In addition, reviewers were not aware of how the department was using the peer review feedback: only 27% believed the department uses the peer review memos in the curriculum revision process (a stated goal of the peer review policy) while the same percent believed that the department used the peer review feedback in the faculty performance review and planning process (the policy explicitly states that the peer review process is not evaluative).

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CONCLUSIONS

Through this case study, we documented and analyzed the implementation of a PRT program meant to further MPH curriculum re-design goals to emphasize competency-based learning. We found that the peer review process was generally, though not uniformly, well received by faculty. The proportion of instructors who said they had already made changes in course design or teaching as a result of PRT (44%) was similar to that found in other studies; for example, about one-third of participants in a PRT program at the University of Nebraska reported making significant changes to some components of teaching as a result of the program (Bernstein et al., 2000). The content of review memos was consistent with the stated goals of the policy, i.e. to encourage innovation and improvement in active teaching and learning methods, help faculty develop as teachers and advisors, and to create a strong community.

One theme emphasized by reviewers was the need to include more practice-based examples in lectures. This suggests that public health faculty recognize that practice experience is highly valued by graduate students, most of whom are being trained for practice rather than research careers or academia. Integrating examples and stories from applied practice helps students to see the relevance and possible applications of theoretical concepts. While not, in itself, active learning, this may help make the material more stimulating and interesting which is a quality of good teaching (Thomas et al., 2014). Reviewers' specific criticism of lecture styles also seemed intended to help instructors increase engagement with students at their level of understanding (Wilkerson & Irby, 1998).

A large number of comments from reviewers related to how instructors could strengthen the connection between the content of the course and the situations in which students might be expected to use or apply the content as public health professionals. In active-learning courses, this is a challenge because the key points are emerging in real-time from the class. Faculty members who are innovating with active learning may not yet be fully competent at aiding students' sense-making when the activity concludes (Ketelaar, Beijaard, den Brok, & Boshuizen, 2013). PRT provides an opportunity to coach faculty in this difficult skill.

As has been noted in other studies, the PRT process provided opportunities for faculty development not only for the instructor but for the reviewer as well (Kohut et al., 2010; Wilkerson & Irby, 1998). In one study, reviewers perceived the process more useful for their own teaching than did faculty being reviewed; however, the PRT process in that study was being used for evaluative purposes to make tenure and promotion decisions, a different context (Kohut et al., 2010). Observing someone else is a way to self-critique and learn new practice (Chism, 2007), and peer review helps faculty interact and learn from one another, providing collegial support (d'Eon et al., 2000). The GH PRT program shows that this was an important outcome: 78% of reviewers and 72% of instructors noted that the peer review process helped them get to know other faculty as colleagues. The increased knowledge of other teachers' courses and the social ties created through PRT are resources which can be used in developing MPH curriculum integration and making connections between coursework and public health practice. Over 80% of reviewers noted that PRT helped them understand the Department's courses, which helps them become better advisors to students. In addition, the GH department has added "teaching innovation" as a standing agenda item at monthly faculty meetings. This additional forum for communicating about teaching aligns with the PRT goals and further reinforces the teaching community. It has helped faculty identify in-house experts for particular innovations, and has helped to emphasize the value placed on educational innovation.

In addition to providing feedback to individual teachers, the PRT process highlighted more general issues or questions which leaders may want to address in the context of school-wide MPH redesign. Topics included the value of competency-based grading (i.e. allowing students to re-submit work until they achieve competency, and only grading the final product), how to engage introverted or shy students and students from diverse cultural backgrounds, and how to minimize technology distraction while also meeting students where they are, i.e. incorporating social media and other new technology into the classroom. It would be helpful to provide more opportunities for the faculty as a whole to discuss such observations and issues. PRT helps to promote active, practice-based learning because it implicitly

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recognizes that teaching is not merely a technical enterprise, but a social practice (d'Eon et al., 2000). By allowing the reviewer and the instructor to define the process, valuing the process of reviewing as well as receiving feedback, and providing multiple opportunities to engage in reflection, PRT helps facilitate the adoption of new social practices around learning, such as project-based learning.

Limitations

This study has several limitations. Although we had a high response rate to the online survey, not all faculty responded and we cannot know how the perceptions and experience of non-respondents might have differed. The thematic analysis drew on written peer review memos, which were only provided for 60% of scheduled reviews. Finally, our analysis of a single case study may not reflect the experience of other schools or departments. However, the framework that resulted may help guide the design of PRT programs in other settings, as discussed below.

RECOMMENDATIONS

Based on our review of PRT literature and this case study, we have created a framework which captures our experience and may guide other schools of public health considering adopting PRT as part of the redesign of MPH programs (Table 2). The framework illustrates pre-disposing factors, policy design, and program implementation features, and how together they may lead to the intended outcomes of PRT.

Pre-disposing Factors

Positive perceptions of PRT are correlated with collegiality and good relations among reviewers and observers (Byrne, Brown, & Challen, 2010). Power dynamics and fear can have an important influence on PRT implementation and outcomes (Byrne et al., 2010; Kell & Annetts, 2012; Kohut et al., 2010). Our study was conducted in a non-tenure situation, which may have reduced power imbalances as we did not need to consider the social relationships among tenured and non-tenured faculty when assigning reviews or sharing review feedback. The absence of tenure may have made it easier for faculty to see the review process as developmental rather than as an evaluation tool (Peel, 2005). In a tenure system, being very clear about the formative purpose of PRT and taking action to reduce power imbalances in pairing of reviewers and instructors is even more important to ensure acceptance of the process.

Another factor associated with successful PRT is whether faculty have established norms of shared inquiry and prior experience working in teams (Thomas et al., 2014). Research has shown that in disciplines where faculty naturally engage in individual research with sole authorship, PRT may be less successful (Thomas et al., 2014). Our case study was conducted in a department which was already used to working in interdisciplinary teams for research projects, which may have made it easier to apply a team approach to reflect on teaching. In situations where team work among faculty is not the norm, leaders may need to spend more time in forming teams and developing teamwork and reflective practice skills to ensure PRT works well.

Policy Design

Leadership is essential to motivate faculty especially in public health schools with soft funding where faculty are juggling the need to cover their salary by generating research dollars and may see teaching as less essential for survival. Time and burden on faculty are consistently raised as issues affecting PRT implementation success (Kell & Annetts, 2012; Siddiqui, Jonas-Dwyer, & Carr, 2007; Thomas et al., 2014). While the model of peer interaction and consultation adopted in this case study was not very intensive--requiring about a half-day of each participating faculty member's time per semester and minimal administrative support--the program experienced compliance problems: 40% of review teams either did not submit written memos or did not conduct the assigned review, and several comments from faculty mentioned the time burden. Leadership is needed to signal that committing time to the process is valued and rewarded.

Leadership is also needed to monitor and evaluate how PRT initiatives contribute to the outcomes of student learning and professional development. Closer management with more frequent reminders and assistance in scheduling could also help increase post-observation written feedback from reviewers and facilitate deeper, more meaningful discussion of observations. Leadership must also make sure that the structure for PRT is focused and

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periodically reinvigorated to avoid stagnation and complacency (Byrne et al., 2010; Kell & Annetts, 2012; Kohut et al., 2010). For example, to re-invigorate a moribund PRT program, one university introduced year-long peer development team projects, where 2-5 teaching staff worked together on a project to improve practice such as effective use of tutorial support, planning and developing a new course, or adapting pedagogy to use interactive whiteboards (Byrne et al., 2010). Kell and Annetts (2012) found changing teams was helpful so conversations didn't stagnate and reflection continued to be constructive.

The developmental focus of the PRT program must be clearly communicated in order to reduce fear and foster development of reflective practice (d'Eon et al., 2000). Even though PRT in this case study was formative and not evaluative, there were misconceptions among faculty. For example, about a third of faculty believed the department uses the peer review feedback in the faculty performance review process, which is not the case. Ensuring faculty are clear on the purpose of the PRT may increase engagement with the process.

In addition, faculty ownership of the process, through opportunities to choose tools and approaches and to influence the way reviews are carried out, increases positive perceptions of PRT and may enable a more critical and collegial examination of teaching practice (Thomas et al., 2014; Toth & McKey, 2010). We fostered faculty ownership through opportunities to choose rubrics, reporting style, specific session or sessions to attend, and the types of other information to consider (e.g. student evaluations, web sites).

A factor which has impeded PRT in some studies is uncertainty about what should be reviewed (Thomas et al., 2014). Some PRT processes use external criteria, while others base the assessment on goals set by the reviewer and instructor (Siddiqui et al., 2007). The GH department's PRT policy did not define "good teaching" criteria in advance other than suggesting that improved teaching should promote competencies that MPH graduates need in the work place. Review teams were allowed to decide which aspects of teaching to assess, and how to interpret and apply the goal of competency-based learning. As in other studies (Courneya et al., 2008), we observed that reviewers were influenced by their own perspectives on teaching, e.g. an aversion to group projects. In addition, our finding that some reviewers were uncertain whether their advice was useful suggests that it might have been helpful to discuss criteria for good teaching to develop a common understanding. This need not reduce the flexibility afforded the faculty in the tools and process used for review. In fact, initial cycles of PRT could be used to construct evidence of qualities of effective teaching (Drew & Klopper, 2014).

Program Implementation

A key question in PRT program implementation is who is qualified to be a peer reviewer (Thomas et al., 2014). One study determined that feedback received from subject specialists and non-specialist assessors was equally reliable and valid (Hanson, 1993). Our investigation provides further evidence that reviewers with different disciplinary backgrounds can still provide useful formative feedback and ideas to stimulate critical reflection. While PRT can help assess relevancy of course content, the purpose of formative PRT is much more about encouraging reflective practice-related dialogue, sharing ideas about specific pedagogic innovations, and sharing constructive feedback that can lead to new understanding and improved practice (Kell & Annetts, 2012; Thomas et al., 2014). In order to achieve these goals, the program needs to assign reviewers to maximize exposure of individual faculty to different styles and approaches to teaching.

Training of peer reviewers may also be beneficial. Although the GH PRT did not provide specific training to peer reviewers, some studies have shown that trained reviewers may be more accurate observers and insightful of their own capabilities, thus establishing trust (Carolan & Wang, 2012; Drew & Klopper, 2014; Kohut et al., 2010; Thomas et al., 2014). Training should recognize that peer review is not just a way to identify mechanical "tips" to improve teaching, but rather it is a service activity to foster questioning of beliefs, assumptions, and habitual practices around teaching (d'Eon et al., 2000; Thomas et al., 2014).

Program implementation requires special attention to create administrative tools to keep track of reviewer assignments and reports, in order to assure equal coverage of courses, and diversity and breadth of experience for

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reviewers. This becomes especially important if peer review is to be implemented across units to increase opportunities to work collaboratively (Thomas et al., 2014).

Finally, leaders should make explicit efforts to connect PRT to other opportunities to engage and enrich teaching community, creating a more comprehensive approach to faculty development. Once the GH department had added teaching innovation as a standing item on the agenda of faculty meetings, topics discussed included use of online software for in-class polls, quizzes, and to take attendance (http://socrative.com/); software for cropping segments of longer video and inserting quiz questions or commentary (https://edpuzzle.com/), and an innovate course design which teaches students about approval of new medicinal products through a game strategy. At the school level, workshops are organized to discuss and promote innovative teaching methods. Other ways to strengthen connections include aligning faculty development with policies and processes for rewarding excellence in teaching, such as awards or grants for teaching projects (Drew & Klopper, 2014). Schools could encourage technique-specific coaching relationships among faculty or provide incentives for faculty to collaborate on new course development as they collaborate on research grants (Frenk et al., 2015). A web site might be created to share teaching tools and methods, and opportunities to discuss cross-cutting teaching issues could be built into meeting schedules. These activities expand the idea of PRT and connect it to the larger goal of promoting a supportive faculty learning community and an organization that values education (Cox, 2004).

Outcomes

Our framework suggests that PRT can lead to outcomes including increased opportunities to reflect on the practice of teaching and increased motivation to learn about teaching (Peel, 2005; Thomas et al., 2014), thus giving faculty greater confidence in their ability to adapt teaching methods to the changing landscape of MPH education. The results of this case study and prior studies show PRT can be beneficial to reviewers as well as instructors (Costello et al., 2001) by helping them learn new design, teaching and assessment methods and become better advisors to students. Schools should consider adapting the PRT process to encourage reflection on criteria of good teaching, and to explicitly recognize the benefits to both reviewers and instructors. PRT has the potential to change the social practice of teaching within MPH education, to re-orient normative standards toward more active, practice-based learning. This is the important role that peer review can play in accelerating educational innovation in training MPH students for careers as public health professionals.

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Table 1: Instructors' and reviewers' attitudes about the peer review process

	Strongly agree or agree	
Instructors	**Number**	**Percent**
Gained new insights about course design, teaching methods, or assessment (n=17)	8	47
Having course reviewed was worthwhile (n=17)	9	53
Peer review is important for faculty development (n=18)	13	72
Reviewers		
Learned new methods of course design, teaching or assessment (n=18)	13	72
Have greater knowledge about Department's course offerings (n=18)	15	83
Helped with getting to know other instructors in the department (n=18)	14	78

Table 2: MPH Peer Review of Teaching Framework: Policy Design/Program Implementation Features and Desired Outcomes

Pre-disposing factors ➡	Policy design ➡	Program implementation ➡	Outcomes
• Prior experience conducting team-based research • Collegial environment	• Leadership support • Faculty ownership • Developmental focus • Common understanding of the characteristics of good teaching • Flexible tools/processes to encourage shared critical reflection	• Does not require specialist reviewers • Assigns reviewers in ways that broadens perspectives and experiences over time • Provides training on how to review and make meaning from review process • Creates tools to track assigned and reviewed courses, and monitor that process is being followed and results are being achieved • Links PRT process to other opportunities to engage and enrich teaching community	• Increased knowledge of whole curriculum • Increased reflective practice • Increased motivation to learn about teaching and confidence in ability to adapt teaching to context • Strengthened teaching community • Re-oriented normative standards of teaching towards active, practice-based learning

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Figure 1: Peer review activities mentioned by reviewers (N=16) and instructors (N=13)