



# FM POD: An Evidence-Based Blended Teaching Skills Program for Rural Preceptors

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**BACKGROUND AND OBJECTIVES:** The University of Calgary's Rural Integrated Community Clerkship anchors final-year medical student education in 9 months of family medicine. The purpose of this pilot study was to evaluate the Family Medicine Preceptor Online Development (FM POD) program, designed to meet the faculty development needs of rural preceptors facing challenges of geographical distribution and time constraints.

**METHODS:** The theoretically based program used a blended learning approach, beginning with a face-to-face workshop to strengthen participants' social presence during online interactions to follow. Asynchronous narrated presentations supplied foundational knowledge prior to facilitated synchronous web conferences, where participants shared experiences and co-constructed new knowledge. The program was evaluated using mixed methods, including surveys and focus group discussion.

**RESULTS:** Evaluation tools generated data with high internal consistency reliability; focus group information substantiated and enriched the quantitative survey data. Participants enjoyed collaborating with colleagues and rated their learning experiences highly, reporting meaningful and statistically significant increases in mean comfort with all the precepting skills taught: giving effective feedback, using questions to teach, teaching communications skills, helping learners in difficulty, and making teaching time-efficient. All effect sizes were large. Increased comfort with distance learning technologies was a positive consequence.

**CONCLUSIONS:** Results support the applicability of principles of social constructivism, experiential learning, and reflective learning in these participants. The program was highly rated and effectively increased participants' comfort with teaching skills, offering practical off-the-peg modular faculty development in basic teaching skills for distributed faculty. Participants appreciated the flexible delivery format, which course developers found readily adaptable for additional topics.

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The Family Medicine Preceptor Online Development (FM POD) program was created for preceptors in the University of Calgary's Rural Integrated Community Clerkship Program (RICC). Longitudinal integrated clerkships (LICs) have been implemented internationally since 1970; they successfully meet clinical training requirements across multiple disciplines, in comprehensive patient care settings where students experience continuity in learning.<sup>1</sup> RICC is a 9-month LIC that places approximately 10% of University of Calgary final-year medical students in rural sites across Alberta and the Northwest Territories. The majority of clinical educational experiences are provided by rural family medicine preceptors, responsible for students' day-to-day clinical instruction and general progress.

The RICC curriculum is a move away from traditional rotation-based and specialist-centered teaching, and many rural preceptors describe uncertainty about bearing primary responsibility for students' education across multiple disciplines. Additional challenges can include fitting teaching into daily practice over extended periods and identifying and giving feedback on learners'

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progress. Additionally, rural preceptors are isolated from main academic centers, leaving some unsure about clerks' learning needs.<sup>2</sup>

Academies struggle with recruitment, retention, and development of widely distributed community-based preceptors.<sup>2-4</sup> Teaching support is essential for the success of the RICC program, but the demands of rural practice and travel distance from academic hubs makes attendance at traditional faculty development events challenging. The FM POD program is a novel delivery format created to address these challenges.

Previous work describes blended learning programs that combine internet-based modules with an interactive component such as online discussion.<sup>5-7</sup> FM POD takes this further by deliberately using accepted educational theory and best practice to develop a distributed program blending face-to-face, asynchronous, and synchronous teaching and learning techniques. The Rural Integrated Community Clerkship Program (RICC), the Office of Distributed Learning and Rural Initiatives (DLRI), and the Office of Faculty Development (OFD) at the University of Calgary collaborated to develop and pilot FM POD.

### *How Learning Theory Helps*

Distributed learning offers an efficient solution to the barriers that rural preceptors face, but sole reliance on self-study distance programs can reinforce feelings of isolation and disconnection.<sup>8,9</sup> FM POD was premised upon social constructivist principles, which describe knowledge as collaboratively created through sharing, comparing, and negotiating new understanding within a group.<sup>10,11</sup> Consequently, each module combined solo preparatory material with real-time virtual workshops to bring preceptors together.

Preceptors needed a uniform body of knowledge to participate in the interactive workshops. Recognizing the broad range of teaching experience within the group, a self-paced narrated PowerPoint® presentation, or

podcast, was sent out before each web conference for individuals to work through at their own pace.<sup>12</sup> Podcasts utilized reflective learning theory, requiring preceptors to draw upon and reflect on previous teaching experiences; this processing time prior to discussion encourages identification of strengths and areas for development, allowing more focused learning during interactive sessions.<sup>13</sup>

Pure content delivery has been shown to have short-term beneficial effects on teaching, at best.<sup>14</sup> Experiential learning theory suggests that learners need to actively elaborate new information in order to develop deeper understanding and improved retention.<sup>15,16</sup> Each synchronous web conference included scenarios and problem-solving activities to encourage geographically dispersed preceptors to compare experiences and examine, test, and use newly learned material together. Distributed learning can be advantageous in this respect, reducing the hierarchical distance between learners and teachers, so learners take a more active part in their education.<sup>17</sup>

Incorporating these theories, a blend of face-to-face, synchronous, and asynchronous educational methods was used to create the opportunity for our distributed preceptors to build a community of learners<sup>18,19</sup> with the shared goal of excellence in clinical teaching. Program elements were: (1) A printed program manual for orientation to objectives, scheduling, technology, and faculty details, (2) An initial face-to-face learning session, to strengthen social presence during subsequent online interactions, enhancing meaningful communications.<sup>20</sup> Software training was incorporated to reduce the barrier that inadequate computer skills can pose to successful distance learning,<sup>21</sup> (3) Anchoring knowledge, supplied in advance using podcasts that preceptors could access repeatedly and at their own convenience, and (4) Synchronous web conferences, for elaboration and social construction of knowledge.

The purpose of this pilot study was to evaluate efficacy, quality, and participant learning experience in the FM POD program, designed to meet the faculty development needs of rural preceptors facing challenges of distance and time constraints.

## **Methods**

The FM POD program was piloted with preceptors who volunteered to take part in the study and evaluated with a one-group pretest-posttest design. Participants were invited to complete pre- and post-program surveys and post-podcast surveys and take part in a post-program focus group to enrich and explain survey findings.

### *FM POD Development*

An expert panel used the results of literature review and environmental scan to develop a self-administered, anonymous six-item online needs assessment survey (survey-monkey.com®) to determine rural preceptors' interest in, and self-perceived need for, faculty development programming. The survey was pilot tested with selected rural preceptors, amended using their feedback, and e-mailed to all rural family medicine preceptors listed in the DLRI database of Alberta clinician teachers for the University of Calgary (n=28). Reminder e-mails were sent after 2 weeks.

Survey results identified the top six topics to include in FM POD. Relevant materials were adapted from the OFD Teaching Scholars in Medicine Program,<sup>22</sup> Practice Based Small Group-Education modules,<sup>23</sup> and Clinical Teaching Tips.<sup>24</sup> Repurposing this material gave some reassurance about the quality of the content and reduced time and expense of program development, which can become prohibitive.<sup>7</sup>

Participants were volunteers from the surveyed group who received no additional payment for taking part in the program. Total time commitment was approximately 1 hour of preparation and 1.5 hours per web conference. Travel costs were

reimbursed for the first module, a face-to-face meeting on Teaching Procedural Skills. Remaining modules were moderated online using the Blackboard® Learning Management System. Each module consisted of a pairing of a podcast created using Breeze® software, with a subsequent real-time virtual workshop

using multimodal Elluminate® web conferencing software. The asynchronous podcasts were released to preceptors by e-mail 1 week prior to the corresponding web conference and remained accessible on Blackboard throughout the course. Copies of this material were distributed at the end of the program. Participants logged

in to web conferences on their own computers and at their preferred locations. The software allows participants to see and hear each other and the workshop moderator and choose whether to project their images to the group using a webcam. Each workshop included a brief presentation designed to structure

**Table 1: Sample Outline of Elluminate Workshop in the University of Calgary Family Medicine Preceptor Online Development Program, 2011**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Questions as Teaching Tools</b><br>Learning objectives: after this workshop, you will be able to:<br>1. Explain how effective questions can help students to learn in a clinical setting<br>2. Create an environment where everyone is happy to answer questions<br>3. Design questions for learners who are at different educational stages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 90 minutes |
| <b>Community building</b><br>TITLE SLIDE: Participant-led discussion on experiences applying techniques we learned last time.<br>Summary<br>OPEN MIKE: check everyone received and viewed podcast and reading assignment/materials. Invite questions, comments on the podcast, content resonance with prior experiences<br>WHITEBOARD: Translate these into additional objectives if required (parking lot)                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 15 minutes |
| <b>Agenda setting</b><br>SLIDE: Today's objectives, modify with parking lot items as required<br>ROUND ROBIN: Invite participants to identify main reasons they use questions in their prior teaching<br>SHARED WHITEBOARD: Participants each share single words to encapsulate prior agendas for asking questions<br>DIDACTIC: Synthesize, add if required (SLIDE: Review the three goals of asking questions in teaching)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10 minutes |
| <b>Creating a safe questioning environment</b><br>VIDEO: Example of intimidating questioning technique<br>SMALL GROUPS: Breakout rooms, participants in threes or fours, explore road-tested techniques for questioning without intimidating; elect a spokesperson<br>ROUNDTABLE, OPEN MIKE: Back together in the main room, spokespeople share in plenary<br>SHARED WHITEBOARD to capture these. Facilitator adds if required, summarizes                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15 minutes |
| <b>Five hairy old chestnuts!</b><br>SLIDE: Five perennial questions about questions<br>OPEN MIKE: Share answers—facilitator to summarize, stress contextual nature of “best” answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10 minutes |
| <b>How to build effective questions</b><br>SLIDE: Review Bloom's taxonomy (given in podcast)<br>QUIZ: Identify the level! Examples of questions at each level, check for comfort with this<br>WORK ALONE: Participants construct one question suitable for a clerk, and one for a resident, on a topic that they often teach, noting any adjustments made if asking the question in the presence of the patient<br>PAIRS: Use breakout rooms to form pairs, share questions, and critique/give peer feedback. Peers must identify the level at which the question is designed to function. Identify the risks/benefits of asking this question with the patient present<br>ROUNDTABLE, OPEN MIKE: Debrief. Problems? Beautiful questions? Invite thoughts on how the patient's presence might change your questioning. Summarize group-generated guidelines from these ideas | 25 minutes |
| <b>Seven deadly sins!</b><br>SLIDE: Facilitator invites participants to silently tally how many they routinely commit<br>OPEN MIKE: Invite solutions/preventative action (keep it lighthearted!)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5 minutes  |
| <b>Closing</b><br>DIDACTIC: Summary or<br>OPEN MIKE: Summary by the group. Invite any further questions on questions; comments<br>FACILITATOR: Introduce the topic for next time and reading assignment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10 minutes |

activities between participants, moderators and content, using chat rooms, shared desktops, break-out rooms, and multimedia. Participants were invited to lead short group discussions at the start of each module, sharing their experiences with the teaching techniques learned in the preceding module (Table 1).

### *FM POD Evaluation*

FM POD was evaluated using pre- and post-program surveys for self-assessment of both experience and comfort levels with the technologies used. Links to these Zoomerang® surveys were available on the Blackboard course site.

One group pretest posttest surveys were also used to measure comfort with the teaching skill components taught in the modules. Comfort level is a measure of self-efficacy,<sup>25,26</sup> used as a proxy for change in future behaviors, because a growing body of literature suggests that self-efficacy expectations influence motivation, persistence, and accomplishment.<sup>27-29</sup> Satisfaction with the program was evaluated using a survey after each podcast, as well as a post-program survey and focus group. Cronbach's alpha coefficient was calculated to establish internal consistency reliability of the survey scales. Statistical significance was set at  $P=.05$ . Paired samples  $t$  tests were used to compare pre- and post-program mean ratings. Effect sizes were calculated to quantify the magnitude of the difference between pre- and post-program ratings. SPSS® statistical software (V20) was used for descriptive and inferential statistical analysis. Focus group information underwent thematic analysis.

### *Ethics*

The Alberta Research Ethics Community Consensus Initiative (AREC-CI) ethics screening tool<sup>30</sup> indicated the study posed minimal risk for participants, so therefore did not require ethics approval according to Conjoint Health Research Ethics Board (CHREB) policy.

## **Results**

### *Rural Preceptors' Learning Needs*

Of 28 preceptors surveyed, 17 (61%) completed the online needs assessment survey, of whom 14 (82% of respondents, 50% surveyed group) expressed interest in taking the program. Preceptors rated the importance of developing 12 specific skills using a 5-point Likert-like scale ranging from "Not important to develop" (1) to "Very important to develop" (5). Giving effective feedback was rated highest with a mean (standard deviation) score of 4.4 (0.8), followed by time-efficient teaching strategies, how to use questions in teaching, and working with learners in difficulty, all rated 4.3 (0.9). Teaching communication skills and teaching procedural and physical examination skills each received mean ratings of 4.2 (1.0). These highest-rated topics constituted the FM POD curriculum. As a first choice, nine of 17 preceptors (53%) preferred faculty development delivered using online, real time, interactive learning; four (23.5%) preferred videoconferencing; and four (23.5%) preferred in-person local meetings.

### *FM POD Participants*

Thirteen preceptors signed up for the program, from sites ranging from Pincher Creek to Yellowknife. Participants' clinics ranged from a distance of 71 km to 1,794 km from the main academic hub in Calgary, served populations of between 2,500 and 18,700 people, and have capability for inpatient management of common family medicine, internal medicine, obstetric, pediatric, and psychiatric problems. Workshop attendance varied between seven and 12 participants, with seven participants completing the entire program. Evaluation response rates declined over time, from 13 to four wholly or partially completed surveys.

### *Experience and Comfort With Distance Learning Technology*

Prior to this program, three of the 13 preceptors had used educational podcasts, and five had used Elluminate.

Preceptors rated their comfort level with technology before and after the program using a five-item, 5-point Likert-like scale ranging from "Very uncomfortable" (1) to "Very comfortable" (5), giving a maximum possible score of 25. Overall comfort with technology showed a statistically significant increase from a mean rating of 18 (4.1) before the program to 22.3 (2.4) after the program ( $P<.01$ ,  $t=4.3$ ). Scale internal consistency reliability was high ( $\alpha=0.8$ , 0.9 for pre- and post-program surveys respectively) and effect size was large ( $r=0.5$ ).

### *Comfort Level With Teaching Skills*

Preceptors rated their comfort level with teaching skills on a 21-item, 5-point Likert-like scale ranging from "Very uncomfortable" (1) to "Very comfortable" (5). Overall comfort level showed a statistically significant increase from a pre-program mean rating of 62.2 (10.0) to 80 (10.6) after the program ( $P<.001$ ,  $t=17.3$ ); effect size was large ( $r=0.7$ ). (Table 2).

### *Program Quality*

Participants rated podcast quality using a four-item, 5-point Likert-like scale ranging from "Strongly disagree" (1) to "Strongly agree" (5). All the podcasts were rated highly (Table 3).

After completing the program, participants rated their level of agreement with statements about the learning experience using a 14-item, 5-point Likert-like scale ranging from "Strongly disagree" (1) to "Strongly agree" (5). Overall, participants rated their learning experience highly, with a mean score of 58.6 (5.5) from a maximum possible score of 66 taking question reversals into account. (Table 4).

When asked to make recommendations for future programs, four of seven (57%) preceptors said the number of independent self-learning online materials should stay the same, while three of seven (43%) said they should be increased. Five of seven (71%) respondents said the

**Table 2: Preceptor Ratings of Comfort With Teaching Skills, Prior to and After Taking the University of Calgary Family Medicine Preceptor Online Development Program, 2011**

| Statement                                                                                                  | Pre-Program Mean Score (SD)<br>n=13; $\alpha=0.9$ | Post-Program Mean Score (SD)<br>n=8; $\alpha=1.0$ | Mean Difference (Post-Pre) |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|----------------------------|
| Using three different models for structuring the feedback conversation                                     | 2.2 (0.6)                                         | 3.8 (0.9)                                         | 1.6*                       |
| Diagnosing, classifying causes of learner difficulty                                                       | 2.3 (0.5)                                         | 3.5 (0.8)                                         | 1.2*                       |
| Troubleshooting tricky feedback situations                                                                 | 2.4 (0.5)                                         | 3.6 (0.7)                                         | 1.2*                       |
| Explaining how effective questioning can help people to learn                                              | 2.5 (0.7)                                         | 4.0 (0.6)                                         | 1.5*                       |
| Describing key principles of active role modeling                                                          | 2.5 (0.9)                                         | 4.0 (0.8)                                         | 1.5*                       |
| Designing questions for students who are in different educational stages                                   | 2.5 (0.9)                                         | 3.8 (0.7)                                         | 1.3*                       |
| Knowing which causes you and your learner can tackle as a team                                             | 2.8 (0.7)                                         | 4.0 (0.8)                                         | 1.2*                       |
| Setting strategic goals for my feedback                                                                    | 2.8 (0.9)                                         | 4.0 (0.5)                                         | 1.2*                       |
| Listing additional resources, when the problem is bigger than you and your learner                         | 2.9 (1.1)                                         | 4.0 (0.6)                                         | 1.1*                       |
| Using a structured model for teaching communication skills                                                 | 2.9 (0.8)                                         | 4.0 (0.9)                                         | 1.1*                       |
| Providing feedback on communication interactions using a learner-centered approach                         | 3.0 (0.7)                                         | 4.3 (0.7)                                         | 1.3*                       |
| Scheduling patients and directing learners for optimal use of everyone's time                              | 3.1 (0.9)                                         | 4.0 (0.8)                                         | 0.9*                       |
| Using techniques that maximize learning from clinical encounters                                           | 3.1 (0.8)                                         | 3.9 (0.6)                                         | 0.8                        |
| Listing elements of good feedback                                                                          | 3.2 (0.7)                                         | 4.0 (0.6)                                         | 0.8                        |
| Applying a model for teaching technical and procedural skills                                              | 3.2 (0.8)                                         | 3.8 (0.9)                                         | 0.6                        |
| Confidently identifying the learner who is in difficulty                                                   | 3.3 (0.6)                                         | 4.0 (0.6)                                         | 0.7*                       |
| Creating an environment where everyone is happy to answer questions—even if they are unsure of the answers | 3.3 (0.9)                                         | 4.0 (0.6)                                         | 0.7                        |
| Providing effective feedback on the clinical skills of others                                              | 3.4 (0.8)                                         | 4.0 (0.5)                                         | 0.6                        |
| Negotiating mutually agreed learning objective                                                             | 3.6 (0.5)                                         | 3.9 (0.4)                                         | 0.3                        |
| Orientating learners to the practice                                                                       | 4.1 (0.8)                                         | 4.4 (0.5)                                         | 0.3                        |

SD—standard deviation, n—number of responses,  $\alpha$ —Cronbach's alpha  
5-point Likert-type scale where 1=Very uncomfortable, 5=Very comfortable  
\*  $P \leq .05$

Pre-program response rate=13 (100%), post-program response rate=8 (62%)

number of synchronous online seminars should stay the same, while two of seven (29%) recommended they be increased.

#### *Qualitative Results: What Preceptors Told Us About the Program*

Preceptors commented positively on program relevance and practicality, supporting the decision to use a needs assessment for content selection.

This has been an excellent program ... and I would surely recommend it to anyone involved in teaching.

#### *Program Delivery Strategy*

Preceptors valued the opportunity to meet one another in person at the first workshop.

**Table 3: Preceptor Ratings of Podcast Quality in the University of Calgary  
Family Medicine Preceptor Online Development Program, 2011**

| Podcast                            | n (%)  | Mean Score (SD) | Cronbach's Alpha |
|------------------------------------|--------|-----------------|------------------|
| Giving effective feedback          | 7 (54) | 16.9 (1.4)      | 0.5              |
| Questions as teaching tools        | 7 (54) | 18.0 (2.1)      | 0.9              |
| Teaching communication skills      | 4 (31) | 16.5 (2.5)      | 0.9              |
| Helping the learner in difficulty  | 5 (38) | 17.0 (2.0)      | 0.8              |
| Time-efficient teaching strategies | 4 (31) | 18.8 (1.9)      | 0.9              |

n—number of responses, (%)—percentage response rate, SD—standard deviation  
5-point Likert scale where 1=strongly disagree, 5=strongly agree; four items per podcast so maximum score=20

**Table 4: Preceptor Ratings of Their Learning Experiences in the University of Calgary  
Family Medicine Preceptor Online Development Program, 2011**

| Statement                                                                                                                                             | Mean Score (SD)<br>$\alpha=0.9$ |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 1. Overall, as a result of the course, my teaching skills have increased                                                                              | 4.1 (0.6)                       |
| 2. Overall, as a result of the course, I am more comfortable teaching in the RICC program                                                             | 4.1 (0.6)                       |
| 3. The program helped me to meet the learning objectives                                                                                              | 4.0 (0.8)                       |
| 4. The program content was relevant to my teaching                                                                                                    | 4.6 (0.5)                       |
| 5. Overall the podcasts were a valuable learning resource                                                                                             | 4.3 (0.5)                       |
| 6. Overall I learned a lot from the online discussions (Elluminate workshops)                                                                         | 4.1 (0.6)                       |
| 7. Overall, the course instructors enhanced my learning experience                                                                                    | 4.3 (0.5)                       |
| 8. Online learning (as occurred in this course) offers a useful method of learning when there are geographic and other barriers to accessing learning | 4.8 (0.5)                       |
| 9. The workload of the program was more than I expected                                                                                               | 3.1 (1.0)                       |
| 10. Overall, this program was a good learning experience                                                                                              | 4.3 (0.5)                       |
| 11. I will recommend this program to future family medicine preceptors                                                                                | 4.5 (0.5)                       |
| 12. The amount of technical problems I experienced with podcasts in this program was minor                                                            | 4.4 (0.7)                       |
| 13. The technical problems experienced with Elluminate (live online discussions) in this course were minor                                            | 4.3 (0.5)                       |
| 14. Overall, the technical support I received during the course was good                                                                              | 3.9 (0.6)                       |

SD—standard deviation,  $\alpha$ —Cronbach's alpha  
5-point Likert scale where 1=Strongly disagree, 5=Strongly agree  
Response rate=eight of 13 surveyed (62%)

Having that first session was a really useful way to launch this, both in terms of getting used to the technology—but also getting a chance to meet the other participants before meeting them online . . . it really added to the process for me.

The FM POD program was wonderful as it provided an excellent base for teaching, as well as providing that network with experienced teachers. It makes it less 'scary' to take on the teaching role!

Comments about the opportunity for independent preparation in advance were overwhelmingly positive.

It was nice to have the background from the podcast and have an opportunity to be thinking of it a little bit.

There was a couple I didn't make time to listen to the podcast ahead of time and a bit of a disadvantage if I didn't.

I thought the combination worked well. We need a format that we can each access at our own pace or preferred time before the joint session and the podcast is . . . an effective way.

Participants valued opportunities to work together during web conferences, applying what they had learned and sharing their experiences.

I found the Elluminate session was . . . more for what the colleagues at other sites were chipping in as pearls or ideas or suggestions.

The sharing of ideas enriched the whole process; it was nice to hear other people struggling with some of the same issues I've struggled with and to find out different ways to approach similar problems, that I tend to remember more than . . . from reading an article.

Some participants commented that occasionally facilitators' face-to-face teaching techniques did not translate well into online delivery, due to the paralinguistic limitations of electronic media.<sup>31</sup>

It is too easy to sit there quietly and hope someone else will speak up . . . it would be more effective if the person asking the questions identified who they wanted to answer them.

#### *The Technology: Podcasts*

Some found the podcasts information dense and delivered too fast but commented that the ease of moving back and forth within the presentation remedied this. Others missed the instructions on how to access resources so encountered difficulties finding the readings.

#### *The Technology: Web Conferences*

Participants commented that the initial training session with Elluminate software built confidence and competence and most found the web conferencing very engaging. Two experienced some frustration due to poor connectivity.

I think that the ability in that meeting to play around with it (Elluminate), to practice with different buttons was very, very helpful. I've found it far more engaging than just a teleconference or even a videoconference.

The technology caused connectivity difficulties for those in low bandwidth areas; some participants

commented that not seeing everyone during the web conferences limited their nonverbal communication, making it difficult to interact naturally and tempting to remain silent.

### **Discussion**

This study evaluated a novel program designed to meet the faculty development needs of preceptors who face challenges posed by geographical distribution and time constraints. Quantitative and qualitative program evaluation indicated participants valued the program, rating content and quality highly and reporting positive learning experiences. FM POD was effective, with participants reporting increased comfort with teaching skills. Evaluation survey psychometrics were good, validating these results.

In our case, web-conferencing software was available at no cost through the university, and there were no hardware expenses as preceptors used their own computers. The time and resources required for program development exceeded initial estimates; in-kind costs ran at approximately 30 administrative hours and 240 faculty hours. However, once developed, reusable learning objects<sup>17</sup> would reduce future costs considerably. Our workshop facilitators generously donated their time.

This was a pilot study involving clinicians in one department at one institution, numbers participating were low, and response rates to elements of the program evaluation dwindled over time. All University of Calgary community preceptors are paid for undergraduate teaching, although there was no additional compensation for taking part in the FM POD program. These factors limit the generalizability of results. Self-report and self-efficacy were used as a proxy measure for potential future behavioral change, also limiting external validity. Next steps might include broadening the program to include urban and rural preceptors across multiple institutions and evaluating at a higher level in

Kirkpatrick's scale using objective measures of teaching skills.<sup>32</sup>

Perceived utility and ease of use are reported as prime factors promoting participation in e-learning.<sup>33</sup> FM POD was developed based on results of a needs assessment, increasing its perceived utility, while initial hands-on training ensured preceptors had little trouble with web conferencing software. Internet-based learning is shown to be as effective as traditional methods,<sup>34</sup> and FM POD did effectively increase participants' comfort levels in all 21 skill components in the syllabus, with statistically and practically significant increases in 13 of these areas. Studies suggest that increased comfort and self-efficacy are associated with future accomplishment.<sup>27-29</sup> Increased confidence with technology was an incidental benefit of taking part in the program.

Results agree with more recent work by Ruggeri et al,<sup>35</sup> suggesting that e-learning programs that incorporate a mix of delivery modalities are more likely to be effective than those that employ a single delivery vehicle. FM POD participants commented on the synergies achieved by the blend of face-to-face, synchronous, and asynchronous components in the program, supporting the value of using the following educational theories in program development:

(1) Meeting one another during the first module, making online collaboration easier (social presence).

(2) Asynchronous components, valued for their convenience and option for review. Podcasts were made available a week before the web conference in a deliberate attempt to avoid overwhelming with too much information too far in advance, yet allow adequate reflection and preparation at each individual's preferred time and pace. Preceptors did reflect on past experiences, evidenced by the exchange of stories and the specific queries brought to the group at subsequent web conferences, lending support to the value of reflective learning for this group.

Synchronous web conference workshops enriched understanding and enabled collaborative problem-solving activities. Participants valued being able to compare teaching challenges and solutions and used shared and new information to create effective teaching solutions. Both quantitative and qualitative results highlighted the educational value of this co-construction of knowledge, supporting the applicability of social constructivism and experiential learning to this group.

In conclusion, the purpose of this pilot study was to evaluate efficacy, quality, and participant learning experience in the FM POD program. Evaluation results showed that the program was effective in increasing participants' comfort with teaching skills, and both program quality and learning experiences were rated highly by participants.

In addition, preceptors told us that they appreciated the flexibility of choosing where, when, and how often to access preparatory materials and of being able to take part in live workshops from any location using a computer and headset. Course developers also found the FM POD format flexible and easily adapted for all the teaching topics selected. As these are perennial faculty development subjects and free of local context, the program could be used in different settings without further modification, making it a practical off-the-shelf option for supporting distributed faculty. The needs assessment offered preceptors a broad range of topics in the knowledge and affective domains. All of these topics were judged to be amenable to FM POD delivery methods, which leads us to believe that this program structure is sufficiently adaptable for potential use across a wider variety of content than has so far been developed.

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