Original Article

Designing interprofessional simulation based faculty development in a new women and children’s hospital in the Middle East: A pilot study

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Abstract

Objectives: This study sheds light on information for clinical educators interested in designing interprofessional simulation based faculty development initiatives.

Methods: A one group pre- and post-test design with a convenience sample was used to examine the relationship between participant knowledge of simulation based learning and effective feedback and the impact of pre-course eLearning on participant cognitive entry behaviours and achievement.

Results: There were significant improvements in aggregate MCQ scores, \( t(39) = 4.08, p < 0.000 \) from pre- to post-test. Participant ability to apply the theory of feedback, with a focus on debriefing, did not improve significantly over the course. Achievement scores related to items on pre-course topics were higher on the pre-test than course-related items. Incoming clinicians recruited from around the world need faculty education fuelled with deliberate practice and mentorship to develop competence in the application of simulation based learning (SBL) theory. Participant achievement scores will benefit from early exposure to concepts in pre-course eLearning.

Conclusion: Two days of SBL faculty development is not adequate for achieving participant competence with the theory and application of feedback. Future research should examine this with a more rigorous research design.

Keywords: Feedback; Interprofessional education; Medical educators; Simulation based faculty development; Simulation based learning

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Introduction

Interprofessional faculty development (FD) is central to clinician educator and institutional success, yet is rarely a focus in hospital settings. This becomes more concerning when opening a new hospital in a Middle Eastern country with a diverse group of healthcare professionals (HCPs). At Sidra Medical and Research Center (SMRC), the frontline unit leadership will be expected to support the orientation needs of incoming interprofessional staff. To do this successfully and ensure a cohesive and consistent patient care model, frontline leadership needs to be familiar with the education plan inclusive of institutional practice, team roles and effective use of simulation based learning (SBL). Senior leadership at SMRC has endorsed a two day FD course as a required standard for frontline leadership involved in the three month orientation and on-boarding process. The aim of the course is to familiarize incoming faculty with (a) the theory of SBL (b) effective use of feedback, (c) Sidra interprofessional practice and (d) team roles to optimize a safe patient opening. Our research questions were (a) is two days of faculty development sufficient for the application of simulation based learning theory and the provision of effective feedback and (b) does pre-course eLearning boost participant cognitive abilities at the start of the course and lead to higher levels of achievement at the end of the course.

The design, development, delivery, and evaluation of curricula are an integral component of FD. Moreover, this should be reviewed regularly to ensure a close match between learning objectives and emerging stakeholder needs. The assumption that experienced HCPs are effective teachers puts the teacher, the mentee, the institution and its patients and families at risk. The risks are intensified when on-boarding HCPs are internationally trained. This creates diversity and variation in practice, which can be challenging when developing a new hospital culture. To help HCPs transition effectively to SMRC, educational leadership has endorsed the use of SBL to create opportunities for new staff to practice the application of institutional standards with members of their team. Simulation Based Learning provides real practice context in a risk-free environment to create a venue for teams to practice task work and teamwork. This type of deliberate practice is used to educate, identify and close performance gaps, so that teams are able to effectively manage real patients. There is a paucity of literature to support FD in health professional education and no prior evidence to support FD in a newly developed tertiary care facility in a Middle Eastern culture has been reported. The role of FD in individual and organizational development has been a popular topic at medical education conferences, and from the first international conference on FD in the health professions, expert consensus released six recommendations to enhance FD initiatives: (a) use a theoretical framework, (b) extend the focus to address various roles of clinicians, (c) recognize the role of FD in creating change, (d) incorporate work-based learning, (e) make FD an expectation, and (f) promote scholarship. These principles are core goals of our educational programme. Relevant theoretical frameworks include interprofessional education, experiential learning theory, and mastery learning.

Interprofessional education provides an opportunity for faculty to learn from, with, and about each other as they work collaboratively to develop the Sidra culture. Interprofessional education continues to be endorsed as an essential strategy in health professional education for enhancing effective team performance; minimizing communication issues that are frequently identified in many adverse events and less than optimal patient outcomes. Healthcare professionals need to feel confident, respected and valued for sharing their perspectives with the team so that they hopefully speak up when they notice something that could negatively impact patient safety.

Experiential learning theory emphasizes the importance of learning from experience. It is an umbrella term that integrates the concepts of deliberate practice, reflective practice, and mastery learning to achieve educational outcomes. Faculty learn through doing and in the process of doing they experience certain outcomes that inform their thought processes and resultant behaviours. From this perspective, experiential learning transitions the learner from a position of knowing to a position of doing in a relationship context (patient, team and/or system). Learning is required to improve understanding that results in best practice. Learners need repetitive opportunities to practice certain skills to master learning and transition from early beginner phases, as detailed in skill acquisition theory, to achieve recognition as an expert. Previous research suggests that up to 10,000 h of practice is required to achieve the status of an expert; however, it is important to acknowledge the lack of consensus on this theory in different professions and specialties.

In a review of the literature addressing the relationship between simulation and FD, results from a small number of studies suggest that faculty need education on choosing the right simulation modality for the right learning objective, and more training in performance assessment. Evidence suggests value in using simulation for standardizing surgical training and assessment of team skills, and improving faculty debriefing and decision-making skills in surgery. In a resident as teacher program, participant self-reports suggest value in using simulation to enhance feedback skills. The majority of published literature is based on surveying institutional experiences and current practice, and the educational theories related to deliberate practice and mastery learning. From these studies, it is clear that additional research is needed on the amount and type of FD, deliberate practice and specific competencies required to master learning.

Creating a safe educational environment to maximize learning has also been identified as important. This can be a challenge, particularly when individuals are expected to perform tasks in front of their peers or other interprofessional team members. Unanticipated and undesirable outcomes from actions can create individual and team...
Faculty development

In SBL FD has been suggested through the published experiences of many clinicians using SBL. Faculty require knowledge and skills related to choosing the right learning modality for the right learning objective in SBL, and identifying and closing performance gaps using feedback effectively.

Step 2: Needs assessment: The need for curricula content in SBL FD has been suggested through the published experiences of many clinicians using SBL. Faculty require knowledge and skills related to choosing the right learning modality for the right learning objective in SBL, and identifying and closing performance gaps using feedback effectively.

Step 3: Goals and learning objectives: The course goals were to (a) provide knowledge and skills to help faculty develop confidence and competence with SBL and effective use of feedback, and (b) immerse all educators in experiential learning so they could experience firsthand the challenges and benefits of using SBL.

Step 4: Educational strategies: We used a blended learning approach; combining didactic and active learning strategies to support participant achievement of the learning objectives. The curriculum was delivered in the temporary simulation centre at SMRC. Didactic lectures over the two days were limited to 20 min, and each session was supported with active learning to provide learners with deliberate practice to apply the concepts. Live and video-based scenarios were developed by faculty to reduce the cognitive load for participants. This included the objectives, which were standardized to control acuity, relevance and ultimately learner tension. The primary scenario objectives were: (a) Identify the condition, (b) Call for help, (c) Manage the condition, (d) Establish role clarity and (e) Demonstrate effective communication. Expert modelling was deliberate; faculty experts modelled application of all theory and concepts prior to engaging participants in deliberate practice.

Step 5: Implementation: Participants were given access to eLearning on interprofessional education, effective team performance, experiential and adult learning theory, and the basics of SBL. Many opportunities were built into the course to allow participants to engage in deliberate practice. Laerdal SimNewB® (USA) and CAE Healthcare PediaSIM HPS (USA) were used to deliver the paediatric seizure and anaphylaxis scenarios, and Laerdal SimMOM® (USA) was used to deliver the eclampsia seizure and anaphylaxis scenarios. Participants were orientated to the functions of each manikin in the pre-brief. Facilitators verbally expressed clinical findings when manikin limitations impeded realism (e.g., colour, movement). Each group delivered the curriculum (a seizure or anaphylaxis scenario) to the partner group. One group member directed the scenario, working closely with the simulation specialists and technologists to ensure manikin responses reflected learner actions. Two group members were asked to record observations related to concentration in guidance and feedback. Participation in the study was voluntary and participants provided written consent prior to engaging in the initiative.

A slight modification and simplified version of Kern and colleagues’ six step approach to curricula design was used. Assessment was added to Step 6 to make explicit the need for both assessment and evaluation; assessment is defined as the gathering of data and evaluation is defined as the judgement of effectiveness.

Step 1: Problem or health need identification: Incoming clinicians need knowledge and skills to optimize SBL in the delivery of Sidra curriculum to incoming staff during the orientation and on-boarding process to secure patient safety on opening.

Lastly, a review of literature addressing the value of pre-course eLearning for FD initiatives exposes another gap in understanding. The theory of metacognition lends support for building the participant’s cognitive entry abilities prior to the educational session and is often the impetus behind pre-learning and schedules of learning (how often learning sessions are provided or reinforced). In children, early access to knowledge improved ability. In animal studies, optimal learning schedules are conditional on the length of the retention interval. However, there is still a great deal of unknown about the impact of scheduling and time lapses in exposure to learning on sustainable learning outcomes.

Materials and Methods

We used a one group pre- and post-test design with a convenience sample to examine the relationship between pre-course eLearning and participant achievement, and participant knowledge of SBL and a two day FD course. Participants were a diverse group of internationally trained clinicians recently recruited to Sidra to support the orientation needs of incoming staff. Participants were assigned to work in interprofessional teams with colleagues from their area of practice to emulate the reality of clinical practice. Pre-briefs highlighted the learning objectives, which focused on delivering effective feedback with faculty coaching. Faculty reinforced that learning objectives were not focused on the clinical performance of individuals within the teams to enhance the safety of the learning environment. An effort was made to keep team members in their natural role. A typical team would consist of a physician leader, two to three nurses assuming the role of documenter, procedure and medication administration when a pharmacist was not in the course, and an allied HCP assuming supportive roles such as social worker, child life therapist or at times a family member if their actual roles were not incorporated into the simulation. Senior faculty met the criteria of having over five years of experience in SBL, strong curricula design skill sets, and experience in a formal education role. Two experienced faculty were assigned to work with each group to maintain consistency in guidance and feedback. Participation in the study was voluntary and participants provided written consent prior to engaging in the initiative.

There are many examples where learning is impacted by performance anxiety both within and external to health care. In a study using ambulatory simulated patients, clinical reasoning was shown to be affected in medical students experiencing high levels of stress. The results suggest they were experiencing premature closure of cognitive processing, leading to fewer items on differential diagnosis. In nursing there are also examples of the effects of performance related stress; Gantt reported that nursing students (control and intervention groups) who had a larger increase in anxiety had lower performance scores on clinical simulations. In another study the presence of nursing faculty during a summative evaluation of students using simulation increased anxiety levels between pre and post tests for the intervention group, although self-confidence, clinical performance and satisfactions were not influenced. There is a paucity of data on FD around anxiety and stress.
learning objectives to facilitate the feedback session. Participants were provided with the Script Assisted Feedback to Educate (SAFE) cognitive aid developed by senior faculty to support their ability in using debriefing as one feedback approach. The SAFE tool reflects a debriefing process developed at the Center for Medical Simulation. At the end of the feedback and debriefing session faculty provided coaching based on learning objectives.

Step 6: Assessment, Evaluation and Feedback: A 12 item multiple choice questionnaire (MCQ) was designed by senior faculty experienced in curricula design and SBL. This was designed to examine the Kirkpatrick Level Two Outcomes; or change in participant knowledge through the development of items examining participants’ ability to comprehend and/or apply knowledge from pre-course eLearning and course curricula. Six items were developed to focus on the pre-course eLearning and six items were developed to focus on application of theory.

Statistical analysis using SPSS 22.0 (Chicago, IL) was completed. Descriptive statistics were completed to provide information (percentage correct, Mean/SD) of each item on the MCQ. Paired t-tests were used to examine differences between pre- and post-test questionnaire responses, and aggregate pre-test and post-test mean scores. The chi-squared test for independence was computed to examine any significant relationships between two nominal or categorical variables. Cohen’s d was used to examine mean effect size differences; the strengths of relationship were based on the conventions: ‘small’ ($d = 0.20–0.49$), ‘medium’ ($d = 0.50–0.79$) and ‘large’ ($d > 0.79$).

Results

Forty one clinicians (Table 1) participated in the course; physicians ($n = 12$), nurses ($n = 14$), nurse practitioners ($n = 2$), and allied health professionals ($n = 8$). There was incomplete data for five participants related to participant characteristics. One participant did not participate in the pre- and post-test; data analyses were based on 40 participants. Data for both days was combined prior to analysis. Thirty-nine percent of participants reported no previous experience with SBL, approximately 15% reported less than one year, 15% reported between 1 and 5 years of experience, and 20% reported over 5 years, with 12% of participants not reporting. All participants reported no previous formal training on the provision of feedback, or SBL. Lastly, all participants had been on-board at Sidra for 3–12 months and so were at various stages of familiarization with SMRC and Sidra Culture.

Aggregate MCQ scores (Table 2) showed a significant improvement from pre- to post-test ($t = 4.08$, $p < 0.000$). There were no significant correlations between years of simulation experience and pre-test scores [$X^2 (21, 1) = 28.55$, $p = 0.125$] or post-test scores [$X^2 (1, 18) = 22.92$, $p = 0.194$].

Mean (M) item scores with standard deviations (SD), percentage of participants achieving the correct response for each item correctly, and level of significance are displayed in Table 3. High mean item scores reflected correct answers, while lower mean item scores reflected incorrect answers. The number 1 was used to code correct answers and a 2 was used to code incorrect answers. On the pre-test mean item scores were lowest for Item 9, which was focused on identifying effective feedback [$M = 1.12$ ($SD = 0.33$)] and highest for Item 1, which focused on identifying interprofessional education experiences [$M = 1.85$ ($SD = 0.36$)]. On the post-test mean item scores were lowest for Item 12, which focused on a participant’s ability to identify integration of experiential theory in scenario design and delivery [$M = 1.07$ ($SD = 0.26$)], and highest for Item 3 [$M = 1.82$ ($SD = 0.38$)], identifying a statement that demonstrated complete and effective closed loop communication. Significant increases in participant ability from pre- to post-test were also found for Item 3, the ability to identify effective closed loop communication ($p < 0.033$), Item 4 and Item 5, the ability to choose the right simulation modality for the learning objective ($p < 0.000$ and $p < 0.006$, respectively), and Item 7, the ability to identify a scenario grounded by all four phases of experiential learning theory ($p < 0.033$).

The results of this study support our first hypothesis that pre-course eLearning is valuable for building participant cognitive entry ability on day one of the course. Our second hypothesis that two days of theory and deliberate practice would significantly improve participant knowledge of optimizing SBL was not supported.

Inclusion of pre course eLearning was effective for enhancing participant cognitive entry behaviours. This was demonstrated by 73–85% of participants answering pre-learning related items (1–3 & 7–8) correctly on the pre-test despite 39% of participants reporting no previous simulation experience and 100% of participants declaring no previous formal training in SBL. In contrast, only 14–55% of participants were able to answer items developed to examine course curriculum objectives such as the effective choice of simulation learning modality for the correct objective (Item 4–6), the provision of effective feedback (Item 9–10), and the application of experiential learning in curricula design (Item 12). Our study is the first to have

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**Table 1: Participant characteristics.**

<table>
<thead>
<tr>
<th>Profession (N)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>12</td>
<td>29.3</td>
</tr>
<tr>
<td>Nurses</td>
<td>14</td>
<td>34.1</td>
</tr>
<tr>
<td>Nurse practitioners</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td>Allied health professionals</td>
<td>8</td>
<td>19.5</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>9.8</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Year of simulation experience (n)</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>&lt;1</td>
<td>6</td>
<td>14.6</td>
</tr>
<tr>
<td>1–5</td>
<td>6</td>
<td>14.6</td>
</tr>
<tr>
<td>&gt;5</td>
<td>8</td>
<td>19.5</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>12.2</td>
</tr>
</tbody>
</table>

**Table 2: Paired sample t-tests for multiple choice exam.**

<table>
<thead>
<tr>
<th>Number of</th>
<th>Pre test</th>
<th>Post test</th>
<th>t (df)</th>
<th>Sig (2-tailed)</th>
<th>Cohen d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scores</td>
<td>mean</td>
<td>mean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N)</td>
<td>total</td>
<td>total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Mean/SD)</td>
<td>(Mean/SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>6.00 (1.63)</td>
<td>7.20 (1.55)</td>
<td>-4.08</td>
<td>0.000</td>
<td>0.76</td>
</tr>
</tbody>
</table>
looked at this in HCP FD courses. We were excited to see a result that provides support for content and construct validity. It was encouraging to see that participants were able to significantly increase their ability with closed loop communication (Item 3) and identification of curriculum grounded by experiential learning theory (Item 7). This is theoretically grounded by deliberate practice; increased opportunities for deliberate practice should translate to improved performance, which occurred in this study ($p < 0.33$). A significant improvement was noted in participants’ ability to choose the right simulation learning modality for the right objective. This was encouraging as one learning activity on day one focused specifically on this, and faculty emphasized the theory with every learning activity that used SBL. We were initially perplexed by results of Item 12, which focused on participants’ ability to identify integration of experiential theory in scenario design, when results from Item 7 supported significant improvement in application of the same concepts. On closer examination, it was noted that the correct answer to Item 7 was D and Item 12 was A, but participants answered Item 12 with D too. We suggest that participant fatigue led participants to automatically answer the same way as they did in Item 7.

Table 3: Results of pre and post multiple choice test.

<table>
<thead>
<tr>
<th>Multiple choice question</th>
<th>Pre test correct (%)</th>
<th>Post test correct (%)</th>
<th>Pre test (Mean/SD)</th>
<th>Post test (Mean)</th>
<th>Significance</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Which of the following scenarios BEST exemplifies Interprofessional education?</td>
<td>85.3</td>
<td>87.8</td>
<td>1.09 (0.30)</td>
<td>1.12 (0.33)</td>
<td>0.570</td>
<td>0.095</td>
</tr>
<tr>
<td>2. Which one of the following represents the BEST definition of effective team performance?</td>
<td>80.5</td>
<td>85.4</td>
<td>1.14 (0.36)</td>
<td>1.19 (0.40)</td>
<td>0.534</td>
<td>0.13</td>
</tr>
<tr>
<td>3. Which of the following statements demonstrates all the steps in using closed loop communication?</td>
<td>75.6</td>
<td>92.7</td>
<td>1.07 (0.26)</td>
<td>1.24 (0.43)</td>
<td>0.033</td>
<td>0.49</td>
</tr>
<tr>
<td>4. The simulation modality that is the BEST choice to demonstrate the correct procedure for arterial blood gas sampling is?</td>
<td>43.9</td>
<td>82.9</td>
<td>1.17 (0.38)</td>
<td>1.53 (0.50)</td>
<td>0.000</td>
<td>0.77</td>
</tr>
<tr>
<td>5. The simulation modalities that are the BEST choices to demonstrate role clarity are:</td>
<td>51.2</td>
<td>73.2</td>
<td>1.25 (0.43)</td>
<td>1.50 (0.50)</td>
<td>0.006</td>
<td>0.54</td>
</tr>
<tr>
<td>6. The simulation modality that is the BEST choice to demonstrate effective resource utilization in the management of a 2-year-old child with anaphylaxis is?</td>
<td>53.7</td>
<td>70.7</td>
<td>1.29 (0.46)</td>
<td>1.46 (0.50)</td>
<td>0.109</td>
<td>0.36</td>
</tr>
<tr>
<td>7. Which of the following examples BEST describes the use of all elements important in the application of experiential learning theory:</td>
<td>73.2</td>
<td>90.2</td>
<td>1.10 (0.30)</td>
<td>1.27 (0.45)</td>
<td>0.033</td>
<td>0.45</td>
</tr>
<tr>
<td>8. Which of the following scenarios BEST describes a comprehensive pre-brief?</td>
<td>73.2</td>
<td>73.2</td>
<td>1.92 (0.26)</td>
<td>1.87 (0.33)</td>
<td>0.421</td>
<td>–0.17</td>
</tr>
<tr>
<td>9. Which of the following examples demonstrates the delivery of effective feedback?</td>
<td>14.6</td>
<td>24.4</td>
<td>1.75 (0.43)</td>
<td>1.85 (0.36)</td>
<td>0.291</td>
<td>0.25</td>
</tr>
<tr>
<td>10. Which of the following examples of feedback demonstrate effective closure of performance gaps?</td>
<td>29.3</td>
<td>58.5</td>
<td>1.63 (0.49)</td>
<td>1.70 (0.46)</td>
<td>0.474</td>
<td>0.15</td>
</tr>
<tr>
<td>11. Which of the following is most important in the development, delivery and assessment of a successful simulation based educational session?</td>
<td>51.2</td>
<td>48.8</td>
<td>1.51 (0.51)</td>
<td>1.48 (0.51)</td>
<td>0.743</td>
<td>–0.06</td>
</tr>
<tr>
<td>12. Which of the following scenarios best exemplify all four phases of the experiential learning cycle?</td>
<td>24.4</td>
<td>17.1</td>
<td>1.82 (0.38)</td>
<td>1.75 (0.44)</td>
<td>0.323</td>
<td>–0.17</td>
</tr>
</tbody>
</table>
The significant improvement in aggregate MCQ scores from pre- to post-test suggests the course supported significant participant learning. Simulation creates a venue for deliberate practice without creating risk to real patients and as such is becoming necessary in training health professionals. Our results suggest more than two days are required to effectively apply theory in knowledge test items related to a debriefing approach to feedback and effective closure of performance gaps. Unfortunately, the research design was not conducive to identifying sources of relationships with this unexpected finding, and further research is needed. We were unable to find any comparable studies to draw from, and again this highlights the importance and need for further and more rigorous research of this nature. The correlation between simulation experience and total pre-test scores \( r = 0.27 \) and post-test scores \( r = 0.25 \) suggests that clinicians in the course who had previous simulation experience probably achieved higher scores, however a more rigorous research design is needed to confirm this assumption.

This study has many limitations. “The small sample size and limited number of MCQ items limited our ability to engage in more rigorous analysis of construct validity. Future research designs should aim for a larger sample and more MCQ items so a factor analysis could be completed to achieve a more rigorous measure of construct validity.”

A sample of at least 180 participants would be needed to complete a factor analysis. Secondly, the transferability of our findings to other groups may be limited with the unusually diverse international group of faculty and the use of a convenience sample. We did not control for nationality and nuances related to social dimensions and culture. In the future, it may be helpful to identify relationships between changes in knowledge and culture.

Apart from showing a small correlation between previous simulation experience and aggregate test scores, further research is needed to understand the source of each of these relationships. Senior faculty plan to replicate the study with a larger sample once Sidra recruits the majority of their operational staff and faculty.

Conclusion

The results of this study reinforce the importance of developing the knowledge and skill of incoming clinicians through pre-learning and faculty development courses. Leaders and educators interested in engaging SBL require the theoretical knowledge and repetitive opportunities to practice delivering effective feedback to optimize learning. At SMRC, two days or 16 h of theory and practice in engaging SBL was not sufficient for developing competence in the provision of feedback. This was surprising and humbling, but reinforced the need for follow-up practice sessions.

Future research is needed to understand more about the relationship between becoming an expert with the provision of feedback and number of hours of experience, and the schedule of experience. On another level, the findings suggest a value added for pre-course eLearning as a mode for boosting participant cognitive entry abilities. Faculty will continue to use this strategy in the future. Our results reinforce the need for more rigorous research designs to provide leaders and educators with evidence-based guidelines in designing effective SBL FD courses. There is much to learn about metacognition and learning. Future research should focus on identifying some of these fundamental relationships so we can secure effective use of SBL for the right learning objectives in the right setting to optimize patient safety.

Ethical approval was obtained from the Sidra Research and Ethics board prior to commencing this pilot study in 2014.

Author contributions

ELS, the corresponding author, conceived of and designed the study, conducted research, collected and organized data, analysed and interpreted data, and wrote the initial and final draft of the manuscript. All authors (JLD, JBS, GFB, EAS & BBJ) worked with ELS on conception and design of the study and collection of data. All authors reviewed and edited first and final drafts of the manuscript.

Conflict of interest

The authors have no conflict of interest to declare.

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