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In this issue:

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E-Learning and Medical Residents, a Qualitative Perspective

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Abstract

Medical education helps ensure doctors acquire skills and knowledge needed to care for patients. However, resident duty hour restrictions have impacted the time residents have available for medical education, leaving resident educators searching for alternate options for effective medical education. Classroom situated e-learning, a blended learning delivery method, was created to find an effective option for medical education. Qualitative phenomenological research was used to understand residents' perceptions of the effectiveness of, and interactions in, classroom situated e-learning and traditional lectures. In-depth interviews were used for data collection. Analysis of the data revealed all participants found classroom situated e- learning effective, and had a preference for interaction that included discussion with the educator and other learners. Recommendations for future research include a replication of this exploratory study with residents in other residency programs, and quantitative research comparing the learning outcomes of classroom situated e-learning with traditional lecture based learning.

1. INTRODUCTION

Medical education is an integral component of the medical system for ensuring that doctors acquire and maintain skills and knowledge essential for patient care. Residency programs generally provide residents with increased hands-on experience with patients. In 2003, the

Accreditation Council for Graduate Medical Education (ACGME) instituted a mandatory reduction in resident duty hours with the intent to improve overall patient safety (Lin, Beck, & Garbutt, 2006). Resident education is considered a part of duty hours. Therefore, the reduction has resulted in a reduction of resident education (Tempelhof, Garman, Langman, &

Adams, 2009). Residents reported that restricted duty hours have led to less time for education (Mathis, Diers, Hornung, Ho, & Rouan, 2006) and missed medical education opportunities due to a focus on service delivery to patients (Vidyarthi, Katz, Wall, Wachter, & Auerbach, 2006).

To resolve this dilemma innovative options are needed to help residents find time for the education needed to become skilled doctors. While lecture is the most common mode of delivery (Robertson, Yun & Murray, 2009), time constraints require the use of other modes of learning. Blended learning, which combines face-to-face interaction with e-learning, is being explored as an alternative modality for medical education. Potential benefits of this approach have been shown to include flexibility (Crouch, 2009), improved test scores (Lewin, Singh, Bateman, and Glover, 2009), and significant cost savings (Sung, Kwon, & Ryu, 2008).

This study investigates an option for effective delivery of medical education that combines e-learning with face-to-face interaction, reflecting the limited amount of time necessitates all education for residents is effective. The use of e-learning takes advantage of technology and the ability to access learning anytime and anyplace. However, it lacks face-to-face discussion, which has been considered critical for student thinking and reflection. There is a need to find, and use, innovative educational options that will meet the learning needs of residents and the educational goals of residency program directors (Templhof et al., 2009). In addition, there is a need to understand residents' perceptions of effective medical education and innovative learning methods in order to build e-learning opportunities to provide quality educational opportunities.

2. LITERATURE REVIEW

Resident medical education is a mandatory component of an accredited residency program, yet mandated hours, full and demanding schedules, and responsibilities make it challenging for residents to find time to participate fully in formal medical education (Templhof et al., 2009). Moreover, continuous physician medical education is critical to maintain and improve healthcare for all patients (Mazmanian, 2010). However, limited time and a continual increase in, and changing of, content in the field of medicine make medical education more challenging than ever (Accreditation Council for Graduate Medical Education, 2007).

Residency program directors must ensure that their programs offer "effective educational experiences for residents that lead to measureable achievement of educational outcomes in the ACGME competencies" (Accreditation Council for Graduate Medical Education, 2007). The core competencies established by the ACGME are: "patient care, medical knowledge, interpersonal and communication skills, professionalism, practice-based learning and improvement, and systems based practice" (Accreditation Council for Graduate Medical Education, 2011, section 4).

A survey of residency program directors in 2011 revealed that more than half of the respondents believed that duty hour restrictions would negatively impact residents' achievement on at least five of the six ACGME core competencies (Antiel et al., 2011). In 2011 ACGME reduced the number of resident work hours which in one institution resulted in a decrease in the number of patients treated by residents and the number of conferences offered, however, no change in test scores was evident (Vucicevis et. al., 2014). Program directors must determine how to effectively deliver resident education within the context of their own programs (Holmboe et al., 2005). E-learning could be a solution to the learning dilemma.

E-Learning
E-learning is a form of distance education, and distance education is over 100 years old when one considers correspondence courses (Means, Yoyama, Murphy, Bakia, & Jones, 2009). Today, distance learning has broadened into a wider variety of options, including e-learning, which has become the quickest growing type of learning in education (Mahle, 2007). E-learning is one of many phrases used to describe a learning experience that employs some type of computer based technology to deliver education or profession development (Remtulla, 2007).

E-learning can be used in a variety of ways, by a variety of learners, and for a variety of reasons. It can be used for synchronous learning, requiring the e-learners and educators to participate in learning experiences at the same time, even though they are in different locations (Means et al., 2009). Khirwadkar (2009) indicated that technology could engage learners in meaningful dialogue around a topic, can provide problem-based learning, or can be used to solve, or work on real life problems. Learners can experience e-learning as it attempts to mimic the traditional classroom experience, like a lecture based class, or it can create an

experience that is completely different from traditional classroom encounters such as electronic games, simulations, problem-based learning, or multifaceted group projects (Means, 2009)

E-Learning and Medical Education

Medical education has been delivered in multiple ways, with a variety of results. While medicine continues to evolve, medical education still primarily relies on passive lecture-based experiences (Graffam, 2007). The use of web based learning for medical education can be traced back to 1992 (Westmoreland, Counnsell, Tu, Wu, & Litzelman, 2010). E-learning for medical education can be used in many ways, resulting in a variety of possible advantages including: easy access to case-based learning, self-paced learning, connecting learning in the clinic with learning outside of the clinic (Stern, 2008), flexibility, adaptability of content for different learners or groups, and easily updatable content (Webber, 2007).

Technology allows for easier creation of, and access to, patient-based learning, which is considered a hallmark of medical education (Smith, Cookson, McKendree, & Harden 2007). Patient-based learning refers to the use of patient cases as an educational tool, much like scenario based learning. Additionally, e-learning in medical education can remove barriers related to location and time. Residents assigned to rotations in off-site locations may not be able to attend lectures at their learning institutions, or hospital (Gray & Tobin, 2010). E-learning provides a broad variety of ways to present content and innovative options for delivering education (Bove, 2008). Researchers have found that residents are comfortable using e-learning methods of education (Westmoreland, Counsell, Tu, Wu & Litzelman, 2010).

Technology has been used in a variety of ways to deliver medical education. Text, images, and sound can be delivered electronically. This eliminates the need to access expensive machines to view certain test results like x-rays, echocardiograms, and other test results. Sounds from stethoscopes, and ventricular assist devices can be turned into audio files and made available to residents to analyze. Simulation offers a way for learners to try new skills in a safe environment (Takayesu, Nadel, Bhatia, & Walls 2010). Content available on smart phones, or through computers located in common areas near patient rooms, can provide valuable just-in-time tools when caring for patients (Bove, 2008).

Along with these benefits come some potential problems associated with e-learning Solitary e-learning can be an isolating experience for learners, and discussion supports students' critical thinking and reflection (Cook & McDonald, 2008). Cook (2006, p. 59) found potential disadvantages could include "social isolation, de-individualized instruction, high development costs, technical problems, and poor instructional design."

Blended Learning in Medical Education

The use of blended learning for medical education has similar variations in the definition and usage of the term. One example of blended learning included a combination of face-to-face lectures and e-learning modules to teach doctoral students in pharmacology (Crouch, 2009). Another blended learning project combined online modules, face-to-face discussions, and video presentations, to teach general practitioners (Bekkers et al., 2010). A third type of blended learning, for new nurses, was made up of face-to-face classroom sessions followed by a series of e-mailed questions, delivered over time, to the learners. The nurses e-mailed their responses to the questions they received. Then the nurses were sent instructional feedback on their responses (Sung et al., 2008).

Medical students in a blended learning program had better exam scores than their peers, who took the same course in a face-to-face lecture format. The blended learning course combined the use of e-learning modules, online communication, and weekly communication with a preceptor (Lewin et al., 2009). General practitioners who participated in a blended learning program on antibiotic resistance reported increased awareness and confidence when making decisions about prescribing antibiotics for patients. They also reported a decrease in the amount of antibiotics they prescribed after the blended learning program (Bekkers et al., 2010).

Organizational staffs have realized benefits from offering blended learning as a medical education option. The initial cost for creating the e-learning component of blended learning can be high, but can ultimately result in a cost savings over face-to-face classes. This is because blended learning allows for continued use of electronic learning components that once created, can be used repeatedly (Sung et al., 2008). Blended learning has been reported to be less demanding on faculty time, because educators are not required to be the sole

disseminator of the course content (Crouch, 2009).

Learners in medical education have also reported benefits from blended learning, beyond their gain in knowledge. Learners enjoyed the flexibility that blended learning could offer (Crouch, 2009). Doctors, in a blended learning program for continuing education in clinical care, appreciated the blended learning approach (Shaw, Long, Chopra, & Kerfoot, 2011). Medical students, in a blended learning program, enjoyed the learning experience, and reported that they were able to apply the information they learned directly to the clinical setting (Lewin et al., 2009).

Blended Learning For This Study
The form of blended learning for this study is classroom situated e-learning, a form created specifically for use with residents at a pediatric hospital in Ohio. This mode of synchronous learning puts a small group of residents and a facilitator in the same room. The content is contained in the e-learning module, which is displayed on a screen located at the front of the room. The facilitator leads the residents through the e-learning module, where residents are encouraged to solve problems, share ideas, and ask questions, as they move through the case and the tasks being presented. The module is also designed to simulate the decisions, test results, and order of decisions that residents must make when seeing patients.

New innovations in medical education are needed to produce excellent doctors, and residency programs are in search of innovative options for delivering effective medical education (Robertson, Yun, & Murray, 2009). Classroom situated e-learning has the potential to meet those needs. However, research must be conducted to determine if the learners believe it is an effective form of medical education.

3. RESEARCH METHOD

This study addressed the need to find an effective mode of medical education that would make the most efficient use of medical residents' limited time. Restrictions in residency hours have impacted the time residents have for medical education (Accreditation Council for Graduate Medical Education, 2011). Residents also experience a highly demanding workload. Both factors limit the time residents have for participating in medical education (Baker, Klein, Samaan & Lewis, 2010). In addition, there is a need to find and use innovative educational options that will meet the learning goals of residents and residency program educators (Tempelhof et al., 2009).

The purpose of this qualitative study was to examine residents' perceptions of the effectiveness of blended learning and the effectiveness of traditional face-to-face lectures. In-depth interviews were used for collecting data. The sample size was nine residents at a pediatric hospital. Given the value of education during residency (Charap, 2004), the high demand on residents' time, and their limited time for education (Baker et al., 2010), alternatives to traditional face-to-face education is needed. Blended learning has the ability to combine face-to-face interaction with e-learning and could be an effective alternative to traditional lecture education.

Research Methods and Design
This study was guided by the following research questions:

Question 1: How do residents perceive the effectiveness of classroom situated e-learning and traditional lecture based learning?

Question 2: How do residents perceive the interaction between the student and the content, the facilitator or instructor, and other students in classroom situated e-learning and traditional lectured based learning?

A qualitative research method was used for this study because it provided the ability to gain a deeper understanding of the phenomenon from the perspective of the participants (Moustakas, 1994), which was the intended goal of the research. This is an interpretive research approach, used to understand how something works, as opposed to trying to fix something that does not work (Schram, 2006). The interpretive approach fit with the intention of the research, to understand the effectiveness of classroom situated e-learning for medical education with residents from the learners' perspectives. A phenomenological perspective was used to understand how people make meaning of an experience or phenomenon (Patton, 2002). The aim of phenomenology is to understand what an experience means for those who have lived it (Moustakas, 1994). A small sample size is typical of qualitative research (Rudestam & Newton, 2007) and is based on the specific goals of qualitative research, in comparison to the larger sample sizes needed for quantitative research. Qualitative research

usually relies on gathering in-depth data from small samples (Patton, 2002).

Sixteen residents participated in at least one e-learning session and of the sixteen, nine pediatric residents agreed to participate in the study. A total of ten interviews were initially conducted with the first interview being a pilot. An interview protocol was created and reviewed by three individuals to establish face validity: a classroom facilitator and medical fellow; a classroom facilitator who was a physician, and a university professor who was a medical anthropologist specializing in qualitative research. As a result of these reviews the interview protocol was revised and piloted with one resident. A transcript of the interview was reviewed and further revisions of the protocol resulted in an instrument that would ensure that the research goals could be addressed.

Each of the nine residents was interviewed for a length of time that varied from 33 minutes to one hour. The average length of the interviews was 43 minutes. During the interviews residents were provided with the definitions of *effective medical education* and *interaction in medical education* being used in this research. For the purpose of the research effective medical education was defined as education that increases residents' knowledge in at least one of the ACGME's six core competencies; patient care, medical knowledge, interpersonal and communication skills, professionalism, practice based learning, and systems based practice Interaction in medical education was defined as interaction between the resident and the content, the resident and the facilitator or educator, and the resident and other residents or learners.

4. RESULTS

Research Question 1
How do residents perceive the effectiveness of classroom situated e-learning and traditional lecture based learning? This question had two elements: participants' perceptions of the effectiveness of classroom situated e-learning; and participants' perceptions of the effectiveness of traditional lectures.

Analysis of the questions resulted in a total of six themes, which were delineated based on the two elements. A combination of direct quotes and paraphrased statements were used to support each theme. These themes are summarized in Table 1.

Question Elements	Theme
Perceptions of classroom-situated e-learning effectiveness	1. Problem-based or case based learning
	2. Access to an expert
	3. Interactive or active learning
	4. Small-group learning
Perceptions of the effectiveness of Traditional Lectures	5. Practical or applicable content
	6. An engaging educator

Table 1: Thematic Results of Research Question 1

Comfort and familiarity was one of the reasons given for residents' preference for lecture based learning. However, only three of the participants in this research made mention of lectures as a form of education with which they have comfort and experience. According to Participant 7, "I think they're fine …it's what I'm used to so … I learn well with them obviously or else I probably would not have gotten this far." None of those participants, however, said it was their preferred way of learning, and two of the participants mentioned their belief that there were better ways for them to learn. Participant 5 described a level of comfort with traditional lectures: "Definitely I think in medical school it was more lecture format, and I think that's just the way my brain worked at that time, so I was used to it." However, Participant 5 went on to describe a change in how he currently prefers to learn:

"Now it's more on the fly, I think it's more time, and plus I won't be listening … if it's not applying directly to my care and my scope of practice."

Research Question 2
How do residents perceive the interaction (between the student and the content, the facilitator or instructor, and other students) in classroom situated e-learning and traditional lectured based learning?

This question has two elements: participants' perceptions of the interactions in classroom-situated e-learning; and participants' perceptions of the interactions in traditional lectures. In addition, each element was divided into the three types of interaction, between the learner and the content, the learner and the educator, and the learner and other learners.

Analysis of the residents' responses to this question resulted in a total of seven themes, which are delineated based on the two elements of the question, and the three types of

interaction. A combination of direct quotes and paraphrased statements were used to support each theme. The themes are summarized in Table 2.

Type of Interaction	Method of Learning	
	Classroom E-Learning	Traditional Lectures
Content	1. Discussion 2. Through the computer	
Educator	3. Providing practical or real world content 4. Asking questions of the educator 5. Feedback from the educator	7. Asking questions of the educator
Learner	6. Discussion	

Table 2: Thematic Results of Research Question 2

Discussion

This research explored participants' perceptions of their lived experiences in classroom situated e-learning and traditional lectures. The research specifically looked at their perceptions of the effectiveness of the two forms of education, and the interactions they experienced in both forms of education. All of the participants had experienced both traditional lectures and classroom situated e-learning prior to participating in the research. The research was conducted using a qualitative, phenomenological approach.

Effectiveness was defined as an increase in knowledge in at least one of the ACGME six core competencies. The competencies are: "patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice" (Antiel et al., 2011, p. 185).

Resident achievement of all six competencies is a requirement for resident education programs (Accreditation Council for Graduate Medical Education, 2007). The first research question was used to understand participants' perceptions of the effectiveness of classroom situated e-learning and traditional lectures. All nine participants reported increased knowledge in at

least two core competencies as a result of participating in classroom situated e-learning. Six participants reported an increase in knowledge in at least one core competency, as a result of participating in an effective traditional lecture.

The first research question was divided into (a) effectiveness of classroom-situated e-learning and (b) effectiveness of traditional lectures. Analysis of the data revealed four themes regarding effective aspects of classroom situated

e-learning: (1) problem-based or case-based learning, (2) access to an expert, (3) interactive or active learning, and (4) small-group learning. Data analysis revealed two themes concerning participants perceived effective aspects of traditional lectures: (5) practical or applicable content, (6) and an engaging lecturer. Participants self-reported positive outcomes, and preference for classroom situated e-learning, adds a new dimension to the possible effective educational options available for use and for research in resident education.

These findings support the need for research that explores new ways to provide resident education (Tempelhof et al., 2009), and the use of blended learning for resident education (Lewin et al., 2009).

The second question was used to learn participants' perceptions about their interactions in classroom situated e-learning and traditional lectures. Interaction in education was based on Moore's (1989) description of three types of interaction; with the content, with the educator, and with other learners. The second research question was divided into (a) classroom situated e-learning, and (b) traditional lectures, which were each further divided by the three types of interaction. When describing classroom situated e-learning, the two themes revealed by data analysis, for interaction type 1 (interaction with the content) were (1) discussion and (2) through the computer. The three themes named for interaction type 2 (interaction with the educator) were: (3) providing practical or real world information, (4) asking questions of the educator, and (5) feedback from the educator. The one theme named for interaction type 3 (interaction with other learners) was (6) discussion. There was no theme for interaction type 1 (interaction with the content) during traditional lectures. The one theme for interaction type 2 (interaction with the educator) was (7) asking questions of the educator, and

there was no theme named for interaction type 3 (interaction with other learners).

Evaluation of the findings revealed the participants preference for education that is based on adult learning theory. All nine participants found classroom situated e-learning, based on adult learning theory, to be effective. Six of the nine participants were able to name an effective traditional lecture, which are based on pedagogy (Stratman et al., 2008). Four of the six themes addressing residents' perception of the effectiveness of classroom situated e-learning and traditional lectures can be correlated with at least one assumption of the andragogical model, Knowles' model of adult learning theory (Knowles et al., 2005).

When asked the most important form of interaction, for their own learning, six participants chose interaction with the content, two chose interaction with the educator, and one chose interaction with other learners. This matches Moore's (1989) description of the importance of the three types of interaction. The data analysis revealed seven themes for interaction in classroom situated e-learning and traditional lectures. However, when looking across the three types of interaction and the two types of learning formats, discussion stood out as a preferred form of interaction. In addition, no themes emerged for interaction with the content for traditional lectures, although learners indicated they believed that type of interaction to be most important for their learning. In addition, not theme was indicated for discussion in traditional lectures, which was the resident's preferred method for interaction.

5. IMPLICATIONS AND CONCLUSIONS

This research used qualitative, phenomenological design, to answer two research questions. The questions addressed residents' perceptions of the effectiveness and interaction in classroom situated e-learning and traditional lectures. Analysis of the data collected from this research revealed 11 themes regarding participants' perceptions of the educational experiences.

Participants found blended learning, in the form of classroom situated e-learning, to be effective and a positive learning experience. Participants reported that traditional lectures have the possibility to be effective, but four participants reported they are not the best way for them to learn, and three participants were unable to provide an example of an effective lecture. They reported that interaction with the content was the most important form of interaction for their learning. However, they had the most agreement regarding interaction with other learners, and said discussion with other learners had a positive effect on their medical education. They also valued conversation and question asking in all three types of interaction.

There were limitations to this research. The first being the use of qualitative research design, which resulted in a small sample size. In addition, participation in the research was voluntary, and those who chose not to participate could have differing perceptions than the residents who chose to participate. Also, the timing of the interviews, at the end and beginning of the academic year, could have affected the participants' perceptions of the educational experiences.

Resident program directors and educators could use the data from this research to further inform their decisions regarding the educational opportunities they provide their residents, and the creation of new educational experiences. There are practical applications that could be considered for residency programs based on the results of this research. The applications for consideration are the value of incorporating blended learning into resident education; the value of incorporating opportunities for resident discussion and conversation, and asking of questions; and the desire to lessen the use of traditional lectures as a form of medical education in residency.

This research added new information to the existing body of knowledge regarding options for effective resident education. However, it also supports continued research in this area. Quantitative and qualitative research in the use of blended learning, in the form of classroom situated e-learning, and other blended learning options, is needed to increase the understanding of the potential benefit of blended learning for medical education. Additional research could also address the potential benefits of interaction between learners, in the form of discussion, and conversation and question asking in medical education.

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Editor's Note:

This paper was selected for inclusion in the journal as a EDSIGCon 2015 Meritorious Paper. The acceptance rate is typically 15% for this category of paper based on blind reviews from six or more peers including three or more former best papers authors who did not submit a paper in 2015.

APPENDIX

Interview Guide
Research Questions

Q1. How do residents perceive the effectiveness of classroom situated e-learning and traditional lecture based learning?

Q2. How do residents perceive the interaction (between the student and the content, the facilitator or instructor, and other students) in classroom situated e-learning and traditional lectured based learning?

Definitions

We are defining effective medical education as education that increases residents' knowledge in at least one of the ACGME's six core competencies. (Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Professionalism, Practice Based Learning, Systems Based Practice)
We are defining interaction in medical education as interaction between the resident and the content, the resident and the facilitator or educator, and between the resident and other residents or learners

Questions

1. Describe a learning experience you have had as a resident that has been effective for you, and increased your knowledge in at least one of the ACGME's six core competencies.
   a. What made the experience effective?
   b. Was there a feeling or "aha moment" that you had during the learning experience and if so describe it?
   c. When did you know it was effective (during or after the experience)?
   d. In which ACGME core competencies was your knowledge increased through the experience?

2. Describe the interactions you had with the content during that experience and any role those interactions played in the effectiveness of the learning experience.
   a. Thinking about the content
   b. Processing the content
   c. Applying the content

3. Describe the interactions you had with the educator during that experience and any role those interactions played in the effectiveness of the learning experience.
   a. How the content was organized and presented
   b. Discussion you had with the educator
   c. Evaluation or feedback provided by the educator
   d. Motivation and interest in the topic you gained from the educator

4. Describe interactions you had with the other learners during the experience and any role those interactions played in the effectiveness of the learning experience.
   a. Discussion with other learners
   b. Presentation or sharing of information by other learners
   c. Motivation or support provided by other learners

5. Thinking about all of your experiences as a learner, what kinds of learning activities work best for you and why?
   a. Describe specific examples of those learning activities and why/how they worked
   b. What made those experiences effective?
   c. How did you know they worked for you?
   d. What was the setting for the experience and did that have an impact?
   e. What was the content of the experience and did that have an impact?
   f. What types of interactions were in those experiences and how did they impact your learning (between you and the content, educator, other learners)?

6. Describe a lecture you have attended as a resident that was effective, and increased your knowledge in at least one of the ACGME's six core competencies.
   a. What was the core competency/s and how was your knowledge increased?
   b. What made the lecture effective (lecturer, content, presentation method…)?
   c. Was there a feeling or "aha moment" you had during the lecture and if so describe it

7. What interactions did you experience with the content during the lecture?
   a. Describe the interactions
   b. How did the interactions impact your learning?
   c. How did they impact your satisfaction with the lecture?

8. What interactions did you experience with the instructor during the lecture?
   a. Describe the interactions
   b. How did the interactions impact your learning?
   c. How did they impact your satisfaction with the lecture?

9. What interactions did you experience with other learners during the lecture?
   a. Describe the interactions
   b. How did the interactions impact your learning?
   c. How did they impact your satisfaction with the lecture? Describe a lecture that was ineffective and did not increase your knowledge in at least one of the ACGME's six core competencies.
   d. What made it ineffective (lecturer, content, presentation method, distractions)?
   e. What did you do to deal with the situation (walk out, do something else, muscle through it)?
   f. What could have made it better?

10. What interactions did you experience with the content during the lecture?
    a. Describe the interactions
    b. How did the interactions impact your learning?
    c. How did they impact your satisfaction with the lecture?

11. What interactions did you experience with the instructor during the lecture?
    a. Describe the interactions
    b. How did the interactions impact your learning?
    c. How did they impact your satisfaction with the lecture?

12. What interactions did you experience with other learners during the lecture?
    a. Describe the interactions
    b. How did the interactions impact your learning?
    c. How did they impact your satisfaction with the lecture?

Now we are going to talk about the rheumatology noon conferences on JIA and JDM, which we are calling classroom-situated e-learning.

13. Did the rheumatology noon conferences have any components that where effective or increased your knowledge in at least one of the ACGME's six core competencies? (If yes)
    a. What was the core competency/s and how was your knowledge increased?
    b. What made it effective (facilitator, content, format, interactivity)?
    c. Was there a feeling or "aha moment" and if so describe it

14. Were there moments during the rheumatology classroom situated e-learning sessions that were ineffective and if so what could be done to increase the effectiveness for you?
    a. What made it ineffective?
    b. How did you deal with the situation (what did you do during those times)?
    c. What would make it more effective?

15. What interactions did you experience with the content during the rheumatology noon conferences?
    a. Describe the interactions
    b. How did the interactions impact your learning?
    c. How did they impact your satisfaction with the conference?

16. What interactions did you experience with the instructor during the rheumatology noon conferences?
    a. Describe the interactions
    b. How did the interactions impact your learning?

    c. How did they impact your satisfaction with the conference?

17. What interactions did you experience with other learners during the rheumatology noon conferences?
    a. Describe the interactions
    b. How did the interactions impact your learning?
    c. How did they impact your satisfaction with the conference?

18. How do you feel overall about lectures as an effective form of education? How do you feel overall about classroom situated e-learning (the rheumatology noon conferences) as an effective form of education?

19. How do you feel overall about the importance of the three types of interaction for your learning?