In this issue:

4. **Differences in Males and Females in When and Why They Become Interested in Information Systems Majors**  
   Johnny Snyder, Colorado Mesa University  
   Gayla Jo Slauson, Colorado Mesa University

15. **How an Active Learning Classroom Transformed IT Executive Management**  
    Amy Connolly, University of South Carolina Upstate  
    Michael Lampe, University of South Carolina Upstate

28. **Acclimating Students to Technology in the First-Year College Experience**  
    Mark Frydenberg, Bentley University  
    William VanderClock, Bentley University

35. **E-Learning and Medical Residents, a Qualitative Perspective**  
    Jill Segerman, Xavier University  
    Elaine Crable, Xavier University  
    James Brodzinski, Valparaiso University

48. **A Technical Infrastructure to Integrate Dynamics AX ERP and CRM into University Curriculum**  
    Hayden Wimmer, Georgia Southern University  
    Kenneth Hall, Bloomsburg University

62. **The Development of an Educational Cloud for IS Curriculum through a Student-Run Data Center**  
    Drew Hwang, Cal Poly Pomona  
    Ron Pike, Cal Poly Pomona  
    Dan Manson, Cal Poly Pomona

71. **Developing Capable Undergraduate Students: A Focus on Problem-Based Learning and Assessment**  
    Greg Blundell, Kent State University, Stark Campus  
    Victor Berardi, Kent State University, Stark Campus
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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.

Keywords: E-learning, E-education, Medical education, Online learning, Distance Learning, Resident Education.

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, &
Residency program directors must ensure that residents have the ability to access learning anytime and anywhere. However, it lack learning opportunities to provide educational opportunities to learners and educators to engage learners in meaningful dialogue around a topic, can be used to describe a learning experience that employs some type of computer-based technology to deliver education.

E-learning can be used in a variety of ways by a variety of institutions. E-learning can mimic the traditional classroom experience, like a lecture-based class, or it can create an environment for learners to experience learning as it attempts to solve, or work on, real-life problems. Learners can experience learning as it attempts to provide problem-based learning, or can be used to provide problem-based learning, requiring the learners and educators to participate in learning experiences at the same time, even though they are in different locations (Means et al., 2009). Khwairakpokpi (2009) indicated that technology could engage learners in meaningful dialogue around a topic, can be used to describe a learning experience that employs some type of computer-based technology to deliver education (Kemmler, 2007).

2. LITERATURE REVIEW

Resident medical education is a mandatory component of an accredited residency program (Templhof et al., 2009). Moreover, continuous medical education is critical to maintain and improve healthcare for all patients (Mazmanian, 2010). However, limited time and resources make medical education challenging for residents to find time to participate fully in formal medical education. Resident medical education is critical to contribute to the field of medicine, as it provides the knowledge and skills needed to become skilled doctors. 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 delivering educational opportunities, the use of e-learning as an alternative to traditional classroom teaching is being explored. Potential benefits of this approach include improved test scores (Lewin, Singh, Zyzanski, Bateman, and Glover, 2009), improved test scores (Crouch, 2009), and significant cost savings (Sung, Kwon, & Ryu, 2008). Bateman, and Glover, 2009), and significant cost savings (Sung, Kwon, & Ryu, 2008). The use of e-learning in medical education is being explored as an alternative to traditional classroom teaching. Potential benefits of this approach include improved test scores (Crouch, 2009), improved test scores (Lewin, Singh, Zyzanski, Bateman, and Glover, 2009), and significant cost savings (Sung, Kwon, & Ryu, 2008).
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, Counsell,
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.

<table>
<thead>
<tr>
<th>Type of Interaction</th>
<th>Method of Learning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td>Classroom E-Learning</td>
<td>Traditional Lectures</td>
</tr>
<tr>
<td>1. Discussion</td>
<td>7. Asking questions of the educator</td>
<td></td>
</tr>
<tr>
<td>2. Through the computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educator</strong></td>
<td>3. Providing practical or real world content</td>
<td></td>
</tr>
<tr>
<td>4. Asking questions of the educator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Feedback from the educator</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Learner</strong></td>
<td>6. Discussion</td>
<td></td>
</tr>
</tbody>
</table>

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.

6. REFERENCES


Housing. *Academic Medicine, 81*(1), 63-67. doi:10.1097/00001888-200601000-00017


internal medicine resident workload and education. *Advances in Health Sciences Education*, doi:10.1007/s10459-9525-5


**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 lecture 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 context 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?

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 were 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?