Assessment of Outcomes and EPAs in Medical Students’ Service Learning

Kathryn J. Dolan, Ph.D.
Assistant Professor of Family Medicine
Texas College of Osteopathic Medicine
And Yuhan Huang, Ms, School of Public Health
University of North Texas Health Science Center
What is service learning?

- Course-based, credit bearing educational experience
- Participate in an organized activity that meets specific learning objective criteria
- Reflect on the service activity
  - Greater understanding of course content
  - Enhanced sense of civic responsibility
- Two goals: meet educational objectives and benefit community stakeholders
Service learning is designed to provide opportunities to engage in experiential learning which

- Is task and problem specific
- Provides opportunities to apply classroom knowledge to patient care
- Improves clinical skills through practice
- Improves skills for medical home practice
- Demonstrates the benefits of altruistic behavior
Model of Learning

John Dewey (1938)

Dewey established the foundation to maximize potential for inquiry-based learning

- Generate interest in the learner
- Be intrinsically worthwhile to the learner
- Present problems that awaken new curiosity and create a demand for information
- Occur over time and be capable of fostering development over time
David Kolb

The Kolb Learning Cycle (1984, 2000)
Service Learning for EPAs

- AAMC’s Core Entrustable Professional Activities: EPA 1, 6, 7, 9, 13
- EPA 1-Gather H & P, perform physical exam
- EPA 6-Provide oral presentation of clinical encounter
- EPA 7-Form clinical questions and retrieve evidence to advance patient care
- EPA 9-Collaborate interprofessionally
- EPA 13-ID system failures
EPA Practice in Years 1 & 2

- Hands on opportunities to exercise clinical skills and professionalism
- Service Learning Activities for EPAs
  - 1-H&Ps, health screenings, vitals
  - 6-Oral presentations/debriefs
  - 7-Form clinical questions while promoting health and safety
  - 9-Collaborate with other members of the health care team
  - 13-Providing care under supervision for the most underserved and vulnerable

All vital for family practice and primary care
TCOM Student Service

Tradition originated at founding of school
- 65% graduates go into primary care

Today, majority coordinated through student organizations

10 hours required each of first four semesters

Meet specific criteria
- Medically related
- Low or no cost service to the community
- Have supervision appropriate for the service

Nearly 1/3 of all service records were at local indigent clinics
A large community health fair
Mentoring high school students interested in health professions
Hands-On CPR Education in the Community
Mission Trip to Haiti
Screenings at a Health Fair in the Asian Community
OMM at Indian Dance Festival Dallas 2018
Flour Babies: Health Education/Pregnancy Prevention Program for Teens
Electronic Reporting of Service

- New opportunity to examine data systematically
- Self report on service activity/event
  - Assessments using Likert-like scale
  - Free text descriptions and comments
  - Written reflections
Items rated using Likert-like scale

- Overall satisfaction with the experience
- Whether it met health promotion/education/prevention objective
- Whether it met using clinical skills objective
- Whether it met working in collaborative teams objective
New analysis focus on students ratings on EPAs

Now have approximately 7500 individual service records

- Previous analysis showed significant differences in ratings on learning outcomes for different services
  - Higher ratings for clinical skills objective for indigent clinics, school and sports physicals
  - Higher ratings for health education objective for health fairs, car seat and bike helmet safety programs

Opportunity to drill down for specific data on learning objectives and EPAs

- Compare learning objective ratings for groups of service activities that exercise different EPAs
Methods

Service organized into 11 categories

- Indigent clinics
- Homeless Services
- School and Sports Physicals
- Health Education and Safety
- Health Fairs
- Screenings for Research Studies
- Health Careers Promotion
- Mission trips
- Senior Services
- On-Campus Clinical Skills Training with Volunteer Patients
- Sports Events
Several of the 11 categories characterized as addressing specific EPAs

- EPA 1, gather H&P, perform exam
  - Indigent clinics, homeless services, school and sports physicals
- EPA 6, orally present clinical encounter
  - Homeless Services, health services
- EPA 7, form clinical questions, obtain evidence
  - Indigent Clinics, homeless services, sporting events
Categories of service using EPAs

- EPA 9, collaborate as member of Interprofessional team
  - Health education and safety, health fairs and screening, indigent clinics
- EPA 13, understand health care system and vulnerabilities, contribute to safety
  - Homeless services, health education and safety
A total of 7494 rating records from 1378 students in three classes are included.

Individuals students ratings of different EPAs are compared
  - Comparison dependent samples

One-sided paired t-test was used with t-scores to calculate the difference in means of EPAs.

Bonferroni correction sets the significance cut-off at $0.05/30=0.0017$ in our case.
Results - Clinical Skills Objective

Significant differences for meeting the clinical skills objective

- EPA6 over EPA1, 7, 9, 13
- EPA1 over EPA7, 9, 13
- EPA7 over EPA9, 13
### Results - Clinical Skills & EPAs

<table>
<thead>
<tr>
<th>Clinical skills objective (t-statistic)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA1 vs. EPA6</td>
<td>-6.19</td>
</tr>
<tr>
<td>EPA1 vs. EPA7</td>
<td>9.1</td>
</tr>
<tr>
<td>EPA1 vs. EPA9</td>
<td>9.62</td>
</tr>
<tr>
<td>EPA1 vs. EPA13</td>
<td>11.12</td>
</tr>
<tr>
<td>EPA6 vs. EPA7</td>
<td>11.67</td>
</tr>
<tr>
<td>EPA6 vs. EPA9</td>
<td>12.98</td>
</tr>
<tr>
<td>EPA6 vs. EPA13</td>
<td>12.81</td>
</tr>
<tr>
<td>EPA7 vs. EPA9</td>
<td>2.14</td>
</tr>
<tr>
<td>EPA7 vs. EPA13</td>
<td>3.81</td>
</tr>
<tr>
<td>EPA9 vs. EPA13</td>
<td>2.65</td>
</tr>
</tbody>
</table>
Results for clinical skills objective & EPAs

- EPA 1, H&P, physical exam
  - Indigent clinics: 48.55% Strongly agree, 30.35 agree
  - Homeless services, 88.04% SA, 8.25 A
  - School, sports physicals, 72.0 SA, 18.9 A

- EPA 6, orally present clinical encounter
  - Homeless services, 88.04% SA, 8.25 A
  - Health services, 65.69% SA, 27.34 A
Results for clinical skills objective & EPAs

- EPA 7, form clinical questions, obtain evidence
  - Indigent clinics, 48.55 SA%, 30.35 A
  - Sporting Events, 43.38 SA%, 34.52 A
Results

Significant differences for meeting the health promotion objective were found in t-tests

- EPA6 over EPA1,7,9,13
- EPA1 over EPA7
- EPA9 over EPA7, 13
<table>
<thead>
<tr>
<th>Health objective</th>
<th>p-value (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA1 vs. <strong>EPA6</strong></td>
<td>-3.6 0.00015* **</td>
</tr>
<tr>
<td>EPA1 vs. EPA7</td>
<td>4.69 &lt;0.0001* **</td>
</tr>
<tr>
<td>EPA1 vs. EPA9</td>
<td>-1.75 0.0406*</td>
</tr>
<tr>
<td>EPA1 vs. EPA13</td>
<td>3.1 0.0018*</td>
</tr>
<tr>
<td><strong>EPA6</strong> vs. EPA7</td>
<td>6.73 &lt;0.0001* **</td>
</tr>
<tr>
<td><strong>EPA6</strong> vs. EPA9</td>
<td>3.53 0.00025* **</td>
</tr>
<tr>
<td><strong>EPA6</strong> vs. EPA13</td>
<td>5.41 &lt;0.0001* **</td>
</tr>
<tr>
<td>EPA7 vs. EPA9</td>
<td>-6.17 &lt;0.0001* **</td>
</tr>
<tr>
<td>EPA7 vs. EPA13</td>
<td>-2.33 0.01*</td>
</tr>
<tr>
<td><strong>EPA9</strong> vs. EPA13</td>
<td>6.71 &lt;0.0001* **</td>
</tr>
</tbody>
</table>
Results, Health Objective & EPAs

EPA 6, orally present evidence
- Homeless services, 88.87 SA, 9.9 A
- Health services, 57.06 SA, 33.94 A

Analysis did not include EPA 12, general procedures of a physician, CPR, universal precautions, counsel and educate patients
- Health education and safety, 71.78 SA, 22.7 A
- Health fairs and screenings, 71.14 SA, 25.61 A
Significant differences for meeting the collaboration skills objective

- EPA6 over EPA7, 9, 13
- EPA1 over EPA7, 9, 13
## Results - Collaboration & EPAs

<table>
<thead>
<tr>
<th></th>
<th>Collaboration objective (t-statistic)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA1 vs. EPA6</td>
<td>-1.88</td>
<td>0.038*</td>
</tr>
<tr>
<td>EPA1 vs. EPA7</td>
<td>3.94</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>EPA1 vs. EPA9</td>
<td>5.36</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>EPA1 vs. EPA13</td>
<td>5.42</td>
<td>0.001*</td>
</tr>
<tr>
<td>EPA6 vs. EPA7</td>
<td>4.56</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>EPA6 vs. EPA9</td>
<td>5.33</td>
<td>0.00025*</td>
</tr>
<tr>
<td>EPA6 vs. EPA13</td>
<td>5.09</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>EPA7 vs. EPA9</td>
<td>1.74</td>
<td>0.0415*</td>
</tr>
<tr>
<td>EPA7 vs. EPA13</td>
<td>1.51</td>
<td>0.066*</td>
</tr>
<tr>
<td><strong>EPA9 vs. EPA13</strong></td>
<td>6.71</td>
<td>0.1214</td>
</tr>
</tbody>
</table>
Results—Collaboration objective

EPA 9, collaborate with IPE team
- Indigent clinics, 51.89% SA, 39.77 A
- Health and safety education, 58.75% SA, 33.9 A
- Health fairs and screening, 55.85% SA, 37.75 A
Discussion

Despite skewedness, discernable differences exist between types of activities meeting various learning objectives

Ratings ran in expected directions

- Activities promoting health and health education rated highest for that learning objective
- Activities exercising clinical skills rated highest for that learning objective

Ratings not expected

- EPA6 likely due to confounding effect
Future analyses

- As the database expands, we will be able to look at specific service activities within each of the categories.
- Better able to control for confounding variables
Learning from what students tell us....

- EPA 1
  I was able to implement OLDCARTS while interacting with actual patients as opposed to the actor patients in Clinical Communications. I had the chance to use the otoscope and learned how to do a blood glucose test. Since a lot of the patients were Spanish speaking I also learned how to communicate with the patient via an interpreter.
  I learned how to guide a first year through a physical exam with my own prior knowledge and experience.
  I was able to master how to effectively and efficiently screen multiple patients at a time. I was also able to refine my physical examination skills learned in year 1 so that I can now do so automatically without having to tediously try and remember each step.
EPA 1, cont.

How to take a history and complete a physical on patients that have trouble understanding English in a manner that would provide them the best care possible.

We learned how to take a focused H&P perform a focused PE and make referrals.

I learned how to triage patients take vital signs and how to use an otoscope. I also got some practice interviewing patients.

I was able to hear atrial fibrillation and atrial flutter for the first time. It was a great experience to be able to hear these abnormalities in practice.

I learned how to guide a first year through a physical exam with my own prior knowledge and experience.
I learned the real life presentation of seizures since one of the clients had a seizure during her exam. Also I learned a lot about how to present a patient after taking a history and do a physical exam. This experience taught me about the issues and specific health challenges the homeless community face on a daily basis.

I learned how to interact with a variety of patients and got acquainted with how to include a medical interpreter while taking a patient history. I became more comfortable with obtaining vitals asking appropriate questions for the visit and reporting back to the physician.
I learned new OMM techniques and somatic dysfunctions and was able to apply these techniques to an actual patient.

I learned more in depth and had real experiences in the lives of Type 1 Diabetic Children. I was able to learn more about their disease and how to live a normal life in camp.

I learned so much! I saw so many patients with neurologic complaints and disease processes (headaches meningitis brain cyst strokes altered mental status etc.) that reinforced what I was studying at the time.

I was able to improve my physical exam skills and learn from upperclassmen how to best approach patient's chief complaint in an efficient manner.

I learned how to better watch for emergency conditions.
EPA 7, cont.

I learned that it's sometimes hard to "tease" out a patient's chief complaint in a setting of OMM especially with vague comments like "upper back pain."

I saw the way OMM could help patients that had pain they had suffered from for extended periods of time. How important it was for some of the people to get BP and glucose checks because they had it running in their families and were afraid they themselves may have some problems but did not have access to healthcare.
This experience showed me the importance of interprofessional teamwork. It was amazing to see physicians, pharmacists, RNs, nurse practitioners, office staff, and medical students work side by side to provide patients with the best possible care.

I really enjoyed the direct collaboration with so many other healthcare professionals. Given that I have an interest in medical missions in the future, I will very likely try to incorporate this interprofessional approach when organizing mission trips.

I learned how to work with a team to create a beneficial teaching experience. We taught the high school children about the brain, its anatomy, nutrition, some physiology, etc. They were able to dissect the brain, engage in outdoor activities, and attend lectures and team-building exercises.
EPA 9, cont.

Proper communication within team to properly serve patients given limited resources

I learned a lot from working with PA students who are currently on their pediatric rotations and have a lot of experience performing physical exams. I learned a few new techniques for evaluating physical status and was able to practice them.

Importance of working as a team to see patients in a way that meets their needs and is also efficient.
I have been working at this clinic for awhile. I continue to learn from the knowledge of the physicians and their constant patience and kindness with each patient they see. I learned that there is a community that needs medical care and is very appreciative of the care they received. 

Importance of making medical care affordable and accessible to all members of a community. 

This experience was truly great! It was a fantastic way to learn about various individuals who use the homeless shelter. There should never be any prejudice regarding individuals whom utilize these services. 

My passion is to continue to work with underserved populations to help reduce the health risk factors by educating members of those communities and by providing them with the proper resources. 

I learned the importance of access to healthcare for everyone. This experience showed me how many immigrants and low income families don't have access to healthcare and how that can greatly affect their health in a negative way. 

I learned the importance of serving the populations who can't afford healthcare visits. By helping those in need we can make a difference in our community.
Contact

Dr. Kathy Dolan
Kathy.Dolan@unthsc.edu
817-735-0432