Abstract
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Introduction: Though called upon to teach the next generation of medical students, residents and faculty at academic medical institutions are rarely given formal training in education. This lack of training, coupled with lack of time to devote to teaching, are leading obstacles for academic clinicians educating medical students.

Methods: Faculty and residents in the Department of Obstetrics and Gynecology at the University of Arkansas for Medical Sciences (UAMS) were asked to complete a 10-item anonymous survey rating items regarding knowledge about teaching, attitudes towards teaching, and the value placed on teaching medical students. Faculty and residents then attended a 2-hour interactive seminar aimed at improving teaching techniques. After the seminar, the attendees were asked to complete the same 10-item survey.

Results: Using roles to match pre-test and post-test responses, a paired samples t-test was analyzed. The faculty group showed significant improvement in two of the 10 items, both of which related to self-assessment of teaching skills. The resident group showed statistically significant improvement in eight out of the 10 items - pertaining to teaching knowledge, teaching skills, attitudes towards teaching, and value of teaching. Cohen's d values showed large to very large effects on 5 of the 8 statistically significant items.

Discussion: A brief teaching seminar given to residents and faculty in our department was successful in improving attitudes and knowledge
related to teaching medical students.

**Keywords**
medical teaching, residents as teachers, faculty development, medical students, teaching skills, medical education
Teaching Now-Teaching (TNT): self-assessment of OB/Gyn faculty and resident teaching skills pre- and post-intervention

Lindsey B. Sward[1], Stanley Ellis[1], Cynthia Mercado[1]

Corresponding author: Dr Lindsey B. Sward lbsward@uams.edu
Institution: 1. University of Arkansas for Medical Sciences
Categories: Educational Strategies, Students/Trainees, Teachers/Trainers (including Faculty Development), Teaching and Learning

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Introduction

The burden to teach the next generation of medical professionals often falls to resident physicians and clinical
faculty in academic medical institutions across the country. Though these physicians are responsible for teaching medical students, the majority have never had any formal training in education (Lake, 2004). Many faculty members at teaching institutions lack either educational resources, the time to pursue the development of teaching skills, or both (Lake, 2004); (Gibson and Campbell, 2000).

Lack of training in education is only one of the challenges that clinician-teachers face. They also are pressed for time with increasing demands for clinical productivity (Lake, 2004); (Gibson and Campbell, 2000). It is understandable how education of medical students, a task that might seem daunting to those who have never been trained to do it, might fall by the wayside when compared to pressing clinical tasks.

The Association of American Medical Colleges (AAMC) conducts a yearly graduate questionnaire (GQ) of senior medical students. The GQ includes questions related to both pre-clinical and clinical experiences and includes benchmarks allowing a school to compare their performance to that of other LCME-accredited schools. Among the questions they are asked, graduating seniors must rate the education received on their clinical clerkships with the items "Faculty provided effective teaching on this clerkship" and "Residents provided effective teaching on this clerkship" (AAMC, 2019). The graduates of the University of Arkansas for Medical Sciences (UAMS) College of Medicine have historically rated their obstetrics and gynecology (OB/Gyn) clerkship poorly on these items compared to seniors at other institutions.

In addition to the AAMC GQ data, internal clerkship evaluation data of the OB/Gyn clerkship at UAMS has highlighted poor teaching efforts on the part of faculty and residents. Some comments from these evaluations included: "It appears that the residents and attendings are too busy to teach," "I was not asked questions or included in the dialog about the treatment plan," and "The biggest problem I had with the {clerkship} was the lack of teaching."

The purpose of this study was to first assess the baseline knowledge of and comfort level with teaching and teaching skills among residents and faculty in the Department of OB/Gyn at UAMS and then to determine whether a seminar on teaching techniques for busy clinicians improved teaching knowledge and comfort levels.

**Methods**

This research study was considered by the Institutional Review Board for the University of Arkansas for Medical Sciences on February 7th, 2018 (IRB #217738), and deemed exempt as it fell within the normal scope of resident education and faculty development. In addition, all research surveys were conducted anonymously and determined to pose no risk to participants. The research was conducted from March 28, 2018, through April 11, 2018, and in accordance with the Declaration of Helsinki.

Residents (PGY1-PGY4), fellows, and faculty members in the Department of OB/Gyn at UAMS were asked to complete a modified version of a validated self-assessment survey regarding teaching skills and attitudes towards teaching (Table 1). This survey was first published by Grady-Weliky and colleagues in *Academic Psychiatry* (Grady-Weliky, Chaudron, and Digiovanni, 2010) and a modified version was used with permission from its creator (Dr. Robert Swantz, Department of Pediatrics, University of Rochester Medical Center). The web link to the 10-item, 5-point Likert scale questionnaire was emailed to all participants, and they were asked to answer anonymously. Residents and faculty members then attended a two-hour education seminar entitled "Teaching Now-Teaching" (TNT). One week after completion of the seminar, the same 10-item questionnaire was emailed again to all participants as a post-course survey.
Table 1: Self-assessment survey of teaching knowledge, skills, attitudes, and values

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>1 = Strongly Disagree</th>
<th>2 = Disagree</th>
<th>3 = Neutral</th>
<th>4 = Agree</th>
<th>5 = Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I understand my role teaching students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I understand the curriculum.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Skill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can apply at least two different teaching methods.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I can describe and evaluate the teaching techniques that I employ.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I have a plan for improving my teaching skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I can help others become better teachers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am comfortable teaching students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>My students would describe my teaching skills as good.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>My peers would describe my teaching skills as good.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing teaching skills is important to professional development.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Content for the TNT seminar was derived from the Association of Professors of Gynecology and Obstetrics (APGO) Effective Preceptor Series (Abbott, Espey, and Emmons, 2013); (Hampton and Forstein, 2014). The course utilized a mixture of PowerPoint slides, video demonstration, role-play, and team activities to teach two different teaching techniques.

The two different teaching techniques taught were the Five-Step Microskills Model of Clinical Teaching and the B.I.D. Model for teaching in the operating room (Abbott, Espey, and Emmons, 2013); (Hampton and Forstein, 2014). The Five-Step Microskills model, also called the one-minute preceptor, was originally described in 1992 by Neher and colleagues. It is useful in settings where learners begin by seeing patients and then seek out the guidance of a preceptor, such as in an ambulatory care setting. The preceptor prompts the learner to make a commitment and support that commitment with evidence. The remainder of the Microskills revolve around teaching a general rule, reinforcing positive portions of the encounter, and correcting learner mistakes (Neher and Stevens, 2003). The Briefing, Intraoperative Teaching, Debriefing (B.I.D.) model, originally described by Roberts et al. in 2009, is used for operating room teaching. This technique focuses on setting learning objectives, providing teaching during the surgical encounter, and then reflecting on what was learned – all in a manner than can be performed during the usual activities that a surgeon performs. For instance, the setting of learning objectives can be performed at the scrub sink, and the reflection can be performed during the closing portion of the procedure (Roberts et al., 2009).

At the completion of the seminar, attendees were given laminated reference cards as a visual reminder of the teaching techniques taught (Figures 1 and 2). Posters displaying the same content as the reference cards were also hung in strategic locations in clinics and on the wards where they could be seen by faculty, fellows, and residents.

Figure 1 - 5 Microskills teaching card
Figure 2 - BID teaching card
Results/Analysis

The data collected was analyzed using SPSS version 25. A paired samples t-test using roles to match the pre-test and post-test responses were each analyzed: faculty and fellows (n=17) and residents, PGY 1-4 (n=15) (Table 2). The faculty and fellows group showed significant increases in the post-test means for statements related to improving skills following the seminar: "I have a plan for improving my teaching skills" [3.35 ± 0.79 vs. 4.24 ± 1.03, t (17) = -2.985, p= 0.009] and "I can help others become better teachers." [3.29 ± 0.59 vs. 4.06 ± 1.03, t (17) = -2.748, p= 0.014]

For the resident group, with the exception of value, almost all areas assessed (8/10) showed statistically significant improvements in their post-test means. The biggest gains noted would be in skills "I can describe and evaluate the teaching techniques that I employ" [3.67 ± 0.72 vs. 4.53 ± 0.52, t (15) = -4.026, p= 0.001] and attitude "My peers would describe my teaching skills as good" [3.73 ± 0.59 vs. 4.27 ± 0.70, t (15) = -4.000, p= 0.001]. Cohen's d values ranged from large (0.8) to very large (1.3) indicating significant support for the improvements realized in the areas of skill, knowledge and attitude related to teaching.
Table 2 - Faculty and resident pre- and post-test scores on a self-assessment survey of teaching knowledge, skills, attitudes, and values

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>Faculty and Fellows (n=17)</th>
<th>Pretest (Mean ± sd)</th>
<th>Post-test (Mean ± sd)</th>
<th>p</th>
<th>Cohen's d</th>
<th>Residents, PGY 1-4 (n=15)</th>
<th>Pretest (Mean ± sd)</th>
<th>Post-test (Mean ± sd)</th>
<th>p</th>
<th>Cohen's d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I understand my role teaching students</td>
<td></td>
<td>4.35 ± 0.79</td>
<td>4.41 ± 1.06</td>
<td>0.854</td>
<td>0.064</td>
<td></td>
<td>4.20 ± 0.41</td>
<td>4.53 ± 0.52</td>
<td>0.055</td>
<td>0.705</td>
</tr>
<tr>
<td>I understand the curriculum</td>
<td></td>
<td>3.76 ± 0.90</td>
<td>4.06 ± 0.97</td>
<td>0.351</td>
<td>0.321</td>
<td></td>
<td>3.67 ± 0.82</td>
<td>4.40 ± 0.51</td>
<td>0.006</td>
<td>1.075</td>
</tr>
<tr>
<td>Skill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can apply at least two different teaching methods inpatient and outpatient settings</td>
<td></td>
<td>4.24 ± 0.75</td>
<td>4.12 ± 1.11</td>
<td>0.735</td>
<td>0.126</td>
<td></td>
<td>4.20 ± 0.68</td>
<td>4.60 ± 0.51</td>
<td>0.054</td>
<td>0.669</td>
</tr>
<tr>
<td>I can describe and evaluate the teaching techniques that I employ</td>
<td></td>
<td>3.65 ± 0.86</td>
<td>4.06 ± 0.90</td>
<td>0.168</td>
<td>0.466</td>
<td></td>
<td>3.67 ± 0.72</td>
<td>4.53 ± 0.52</td>
<td>0.001</td>
<td>1.368</td>
</tr>
<tr>
<td>I have a plan for improving my teaching skills</td>
<td></td>
<td>3.35 ± 0.79</td>
<td>4.24 ± 1.03</td>
<td>0.009**</td>
<td>0.968</td>
<td></td>
<td>3.53 ± 0.99</td>
<td>4.53 ± 0.52</td>
<td>0.006**</td>
<td>1.267</td>
</tr>
<tr>
<td>I can help others become better teachers</td>
<td></td>
<td>3.29 ± 0.59</td>
<td>4.06 ± 1.03</td>
<td>0.014*</td>
<td>0.919</td>
<td></td>
<td>3.40 ± 1.06</td>
<td>4.40 ± 0.63</td>
<td>0.004**</td>
<td>1.149</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am comfortable teaching students</td>
<td></td>
<td>4.24 ± 0.56</td>
<td>4.53 ± 1.01</td>
<td>0.369</td>
<td>0.356</td>
<td></td>
<td>4.20 ± 0.56</td>
<td>4.60 ± 0.51</td>
<td>0.054*</td>
<td>0.748</td>
</tr>
<tr>
<td>Third year medical students would describe my teaching skills as good</td>
<td></td>
<td>3.94 ± 0.56</td>
<td>4.18 ± 1.07</td>
<td>0.410</td>
<td>0.281</td>
<td></td>
<td>3.73 ± 0.70</td>
<td>4.40 ± 0.74</td>
<td>0.012*</td>
<td>0.721</td>
</tr>
<tr>
<td>My peers would describe my teaching skills as good</td>
<td></td>
<td>3.76 ± 0.56</td>
<td>4.00 ± 1.06</td>
<td>0.431</td>
<td>0.283</td>
<td></td>
<td>3.73 ± 0.59</td>
<td>4.27 ± 0.70</td>
<td>0.001***</td>
<td>0.829</td>
</tr>
<tr>
<td>Value</td>
<td></td>
<td>4.41 ± 0.51</td>
<td>4.41 ± 1.00</td>
<td>1.000</td>
<td>0.795</td>
<td></td>
<td>4.53 ± 0.52</td>
<td>4.60 ± 0.51</td>
<td>0.670</td>
<td>0.137</td>
</tr>
</tbody>
</table>

Discussion

We found that knowledge about teaching, teaching skills, and attitudes towards teaching improved among OB/Gyn residents and faculty with a 2-hour seminar on teaching techniques. These improvements were especially evident among the resident group of survey responders. Though both groups surveyed showed improvement in knowledge of teaching skills, the resident group showed improvements in knowledge regarding teaching roles, teaching skills, and attitudes towards teaching. The teaching seminar we conducted was brief and simple, teaching well-described models and concepts, and would be easily replicable for different groups of residents and faculty across departments and campuses.

There are limitations to our study. One limitation is that we examined personal perceptions of knowledge, skills, and attitudes related to teaching, as opposed to unbiased measurements. Second, there was no control group surveyed, as all residents and faculty who responded to the post-intervention questionnaire had participated in the TNT seminar.
Finally, ours was a study of the knowledge and comfort levels of the teachers and was not designed to show how these perceived improvements in their teaching affected student opinions of the clerkship. While this would make for an interesting follow-up study, there would be too many confounding variables to establish a true causative relationship between our intervention and better student evaluations of their OB/Gyn clerkship. Though cause and effect would be impossible to measure, we believe that, as a result of our intervention, more knowledgeable and confident teachers will lead to improvements in student attitudes towards our clerkship. This is data that we desire to collect in the near future, using the AAMC GQ as well as internal clerkship evaluations.

Another interesting question would be whether or not the perceived improvement in teaching skills in our department leads to improvements in student education. This could be assessed by evaluating scores on National Board of Medical Examiners (NBME) shelf exams and OB/Gyn related items on the United States Medical Licensing Examination (USMLE) Step 2 Clinical Knowledge exam. Though again, due to confounding variables, an overall causative relationship would be impossible to establish between the TNT seminar and improved student education. We do feel, however, that creating better educators with simple useful teaching tools can only lead to better student education.

**Conclusion**

TNT was an easy-to-conduct educational seminar that led to improvements in perceived teaching knowledge, skills, and attitudes among OB/Gyn faculty and residents. It is our hope that these improvements will translate to better medical student perceptions of and education during their OB/Gyn clerkship.

**Take Home Messages**

- Busy schedules and lack of formal training in education are challenges to clinicians as they teach the next generation of physicians.
- Teaching Now-Teaching (TNT) was a brief, interactive educational seminar on teaching techniques.
- The five-step microskills model and the BID model were taught to faculty and residents in the department of OB/Gyn at UAMS.
- Faculty and resident self-assessment of teaching skills improved after the TNT seminar.

**Notes On Contributors**

Dr. Lindsey B. Sward, MD, is an assistant professor in the Department of Obstetrics and Gynecology (OB/Gyn) at the University of Arkansas for Medical Sciences. Dr. Sward is also the clerkship director for the junior medical student OB/Gyn clerkship. Dr. Sward's ORCID number is [https://orcid.org/0000-0002-6395-8123](https://orcid.org/0000-0002-6395-8123).

Dr. Stanley Ellis, Ed.D, is an assistant professor at the University of Arkansas for Medical Sciences and currently works in the College of Medicine's Institute for Digital Health and Innovation. Dr. Ellis was instrumental in helping to create a faculty and resident development series on education for the Department of OB/Gyn.

Ms. Cynthia Mercado, EMBA, MA, works in the Office of Educational Development at the University of Arkansas for Medical Sciences. Her areas of expertise include designing research surveys and evaluations, managing research data, and providing statistical reports of survey data.
Acknowledgements

Figure 1. Source: Author Lindsey B. Sward, creator and copyright holder of photograph and laminated card.

Figure 2. Source: Author Lindsey B. Sward, creator and copyright holder of photograph and laminated card.

Bibliography/References


Appendices

None.

Declarations

The author has declared the conflicts of interest below.

Dr. Stanley Ellis, Ed.D, serves as a reviewer for MedEdPublish.

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Ethics Statement

This research study was considered by the Institutional Review Board for the University of Arkansas for Medical Sciences on February 7th, 2018 (IRB #217738), and deemed exempt as it fell within the normal scope of resident education and faculty development. In addition, all research surveys were conducted anonymously and determined to pose no risk to participants. The research was conducted from March 28, 2018, through April 11, 2018, and in accordance with the Declaration of Helsinki.

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Reviewer Report 28 December 2020

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**Trevor Gibbs**

AMEE

This review has been migrated. The reviewer awarded 3 stars out of 5

An interesting paper about micro-skills teaching, but I believe spoiled by the low level of evaluation. I thought that we had moved on from Kirkpatrick level 1 evaluation and using it to give solid recommendations. I hope that the authors can look at a more longitudinal approach to evaluation and look at the effects upon faculty's teaching skills

**Competing Interests:** No conflicts of interest were disclosed.

Reviewer Report 15 May 2020

https://doi.org/10.21956/mep.19974.r30370

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**Ken Masters**

Sultan Qaboos University

This review has been migrated. The reviewer awarded 2 stars out of 5

A paper on a concept of “Teaching Now-Teaching” (TNT), with the emphasis on improving teaching skills among faculty and residents with a 2-hour seminar. While the concept is interesting, it really is difficult to determine the benefit of the seminar beyond the perception of the attendees. This is mentioned as a “limitation,” but I think it really is quite a bit more than that, as it does not really tell us much about the
success or the failure of the intervention. Imagine, for instance, if I took a group of lay-people (and, for all intents and purposes, when it comes to education, these were lay-people), and gave them a 2-hour seminar on neurosurgery, and then evaluated the success of that intervention seminar with a self-evaluation. While it would be nice to know how they felt about neurosurgery, when trying to judge how good they would be as neurosurgeons, I think the process of evaluation would be described as a little more than a “limitation”. And so, with this group of people as educators. I also disagree with the authors that cause and effect is impossible to measure. Around the world, education students are taught to be teachers and then evaluated in their teaching (just as doctors or any other professionals are evaluated). While this does not tell us the long-term impact of the teacher (just as medical examinations of any sort cannot tell us about the long-term impact of the doctor), it does give a measurement of their skills as new educators. So, I think what the authors have is a very useful small pilot-study, in which they have evaluated the perceived impact on the attendees; for it to be a research article that would have value, to their institution and elsewhere, however, would require quite a bit more evaluation. Failing that, the authors would have to make a strong argument for a connection between self-perception and activity in the classroom.

**Competing Interests:** No conflicts of interest were disclosed.

Review Report 28 January 2020

https://doi.org/10.21956/mep.19974.r30371

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**Felix Silwimba**
University of Lusaka

This review has been migrated. The reviewer awarded 5 stars out of 5

TNT is a good innovation. truly those handling physicians for the next generation need medical education skills. this is an encouraging study. needs replication in other settings.

**Competing Interests:** No conflicts of interest were disclosed.