Utilization of the Flipped Classroom in Anesthesiology Graduate Medical Education: An Initial Survey of Faculty Beliefs and Practices About Active Learning

SUSAN M. MARTINELLI, MD
FEI CHEN, PhD

MATTHEW D MCEVOY, MD
DAVID A ZVARA, MD

RANDALL M. SCHELL, MD

INTRODUCTION

Physician training in graduate medical education (GME) has historically been provided through clinical experience in an apprenticeship model that is supplemented with didactics, typically presented in a traditional lecture-based format (TL). However, high clinical volume and duty hour constraints often make it challenging to transfer an ever-increasing amount of factual knowledge to residents. Furthermore, the current generation of learners desires technology-facilitated education supplemented with interactive, creative, motivating, and team-based classroom work.[1] Therefore, the use of face-to-face classroom time for delivering TL may not be the most efficient, effective, or preferred method of teaching.[2]

The goal of the flipped classroom (FC) is to depart from passive teacher-centered, lecture-based teaching to focus on learner-centered participatory learning.[2–4] Time spent learning factual information is removed from the classroom so that class time can be spent on problem-solving that activates prior knowledge and focuses on application and understanding.[4,5] Students receive foundational factual knowledge, often through short, focused, online videos as "homework" done before class; classroom time is used for problem-solving (traditionally termed "homework"). Potential benefits of FC include the ability to assess understanding of material, correct deficits, accommodate different learning styles and paces, encourage student engagement, and allow coverage of more material.[6] Leaners have more control over their educational environment and are expected to come to class prepared. Various active learning (AL) techniques are then utilized in the classroom to engage leaners and apply knowledge through problem-solving. It is thought that through this application of knowledge, students will better retain what they are learning.

While FC is gaining popularity in education, faculty's capability and willingness to utilize FC may hinder the prevalent use of this model in anesthesiology education. This study surveyed faculty beliefs and practices on the use of generalized AL with a focus on the FC targeting a national population of academic anesthesiologists. The purpose of this study was multi-fold. Specifically, we aimed to determine 1) the frequency in which FC is used in anesthesiology residency education, 2) the perceived barriers to this utilization, 3) how to increase utilization of the FC (ie, break down those barriers), and 4) AL techniques perceived to be most and least compatible with faculty teaching styles.

METHODS

The study was determined exempt by the Institutional Review Board (IRB) of the University of North Carolina at Chapel Hill. The Society of Academic Associations of Anesthesiology and Perioperative Medicine (SAAAPM) sent our survey to all core program directors (PD) via their LISTSERV with a request for the PDs to forward the survey invitation to all their clinical faculty members. Additionally, we requested that the PDs provide information on the name of their institution and the number of faculty who received the forwarded the email invitation so that we could determine the response rate. In our invitation for participation, we described the purpose of the survey and included an informed consent statement. Participants verified that they understood the purpose and nature of the study and agreed to participate before completing the anonymous survey. All participants had the opportunity to enter their email address into a lottery for a $250 VISA gift card. Ten participants were randomly selected to win $250 each. Participants understood that the survey was voluntary and confidential, and that they could withdraw at any point. REDCap (Research Electronic Data Capture),[7] a web-based application, was used for survey data collection and management. The initial invitation email was sent through SAAAPM on April 27, 2016, followed by a reminder from SAAAPM on May 10, 2016. The survey was closed on May 25, 2016.

A questionnaire was developed to survey faculty regarding their knowledge of AL and FC, learning and teaching experience with FC, and preference for and perceptions of using FC in anesthesiology residency education. A survey expert and the core research team members independently reviewed the survey to identify and correct ambiguous questions or wording, unclear instructions, or other problems with the instrument. The same procedure was repeated for the web-based survey prior to finalizing. The survey was piloted with 10 participants, and their feedback was collected. The 10 participants

were practicing physicians from various specialty backgrounds, with differing years in practice and from multiple institutions. The participants were asked to track the time needed for survey completion and provide feedback on the survey via phone call or in person. According to the participants, the initial survey was too lengthy, taking about 20 minutes to complete. Thus, the survey was revised—including removal of 16 questions—based on this feedback. (See Appendix A for the final survey.) The pilot data were not included in the final survey data analysis. Data from the 2016 anesthesiology faculty roster, published on the Association of American Medical Colleges (AAMC) Faulty Roster website (https://www.aamc.org/data/facultyroster/reports/) were used to assess the representativeness of the survey sample.

The final data were reviewed for outliers and unusual values prior to analysis. Impossible answers signifying entry errors from participants were excluded from analysis (eg, year of birth = 2016). Fisher exact test and chi-squared test were used to examine the extent of the sample representativeness of US anesthesiology faculty in terms of demographic data. Descriptive analyses included the calculation of frequency and percentage for categorical variables, as well as the calculation of means, medians, and standard deviations for continuous variables. The Kruskal-Wallis test was used to examine the association between categorical and ordinal variables. All statistical inferences were made at a significance level of 0.05. Data were cleaned and analyzed using the SAS 9.4 software (SAS Institute Inc, Cary, NC).

Results

A total of 244 anesthesiology faculty completed the survey. See Table 1 for the distribution of the participants by region, gender, and generation.[8] Twenty-seven of the 136 anesthesiology residency PDs in the United States responded to the survey invitation (response rate = 20%). Among the 27 PDs, 23 forwarded the survey invitation to at least one other faculty member in their program. In total, the PDs forwarded the survey invitation to 1437 faculty members. With regards to PDs who forwarded the invitation on to their faculty, comparison of the responders to the nonresponders found no significant group difference in terms of geographical location (Fisher exact test $P = 0.42$). However, there was a significant difference in the distribution of geographical location (Fisher exact test $P = 0.02$) of responders versus nonresponders within the group of invited faculty members; a higher proportion of invited faculty members from the South and Midwest responded to the survey than did those practicing in the Northeast and West ($\chi^2 = 83.56$, $P < .0001$). We also divided the sample in half to compare the demographics of the late responders to those of the early responders and found no statistical differences in terms of gender ($\chi^2 = .03$, $P = 0.85$), generation ($\chi^2 = .58$, $P = 0.75$), or years on faculty ($t = -.43$, $P = .67$). However, there was a statistically significant difference in terms of geographical location between the two groups ($\chi^2 = 56.10$, $P < .0001$) in that most participants from the South were early responders (64 of 81), while most participants from the Midwest were late responders (52 of 63). The sample is representative of the national anesthesiology faculty in terms of gender as reported in the AAMC roster 2016 ($\chi^2 = 1.27$, $P = .26$).

Knowledge of Active Learning and Flipped Classroom

Twenty-nine participants (12%) had never heard the term "active learning." Seventy-eight (32%) had "heard of" AL but did not understand what it was. Ninety-nine (41%) believed that they had a "pretty good understanding" and thirty-eight (16%) believed they had a "solid understanding" of AL. Eighty-seven percent of those who had a "pretty good" or "solid" understanding of AL reported that they had utilized AL in their own teaching practice within the previous year (spring 2015–spring 2016). The faculty who had not "heard of" AL or expressed that they did not understand the concept were not asked this question, as they would be unlikely users of this methodology.

The participants were then asked about their knowledge of specific methods of AL. In general, they were aware of the techniques queried with the exception of the think-pair-share model. Forty-nine percent of participants reported no understanding of the think-pair-share model (see Figure 1).

The focus of knowledge was then brought to FC specifically. Among the respondents, fifty (20%) had never heard the term "FC"; 55 (22.5%) had heard of the term FC but did not know what it was. One hundred and thirty-nine (57%) indicated that they had a "pretty good" understanding (37%) or a "solid" understanding (20%) of FC.

Demographic data were analyzed with respect to knowledge levels. The Kruskal-Wallis test showed that faculty from programs in the southern region had a better understanding of FC than did those from other geographical areas (chi-square with 3 df = 26.60, $p < .0001$; see Figure 2). No regional difference was found in terms of knowledge of AL. There was no gender or generational difference found (ie, baby boomers, Generation X, and Generation Y) with regards to understanding of FC or AL. The size of the residency program did not correlate with knowledge of FC or AL.

Current Use of Flipped Classroom in Anesthesiology Resident Education

The faculty that demonstrated a "good" (n = 91) or "solid" (n = 48) understanding of FC were further queried on their usage of this teaching methodology within the past year (spring 2015–spring 2016). The faculty who had never heard the term FC and those with a poor understanding of the concept (n = 105) were not included in this question set, as they would be unlikely users of the method. Seventy-nine faculty (57%) indicated that they had used the FC model in their own teaching. See Table 2 for details of this usage.

Barriers to Using Flipped Classroom in Anesthesiology Resident Education

The faculty that demonstrated a "good" (n = 91) or "solid" (n = 48) understanding of FC were also queried about their perceptions of barriers in the utilization of the FC teaching method. Those who had not heard of FC or who had a poor understanding of the concept (n = 105) were not asked this question as it was unlikely they would have an understanding of the barriers to its usage. As depicted in Figure 3, some of the greatest faculty concerns involved the learners.

FORUMS OF FACULTY DEVELOPMENT ON FLIPPED CLASSROOM FOR ANESTHESIOLOGY RESIDENT EDUCATION

Participants who demonstrated a "good" (n = 91) or "solid" (n = 48) understanding of FC were asked about their training on FC. Those faculty who had not heard of FC or who had a poor understanding of the concept (n = 105) were not asked this question as it was unlikely they would have received education on this topic. Eighty (58%) faculty reported that they had received some form of FC education. Personal reading (33%) was the most common educational forum followed by institutional or departmental lectures (21%) and workshops at regional or national meetings (19%). Less common forums included podcasts, YouTube, or individual online training (9%), and institutional or departmental workshops (9%).

The entire group (N = 244) was queried about their interest in faculty development regarding FC methodology, and 218 (89%) of participants desired education on this topic. Although few faculty had been trained through workshops at their own institution, this was the most preferred form of instruction by participants (50%; see Figure 4). Other educational forums were also requested, such as grand rounds (38%), online training (33%), and personal reading options (31%).

ACTIVE LEARNING TECHNIQUES PERCEIVED COMPATIBLE WITH PARTICIPANT TEACHING STYLES

AL is an essential component of the in-classroom component of FC, so all participants (N = 244) were asked which AL techniques would be most compatible with their own teaching style. The techniques that were perceived to be most fitting were case studies, question-moderated discussion, simulation scenarios, and journal article reviews. The techniques that faculty did not see as usable were role play, games, and think-pair-share questions (see Figure 5).

DISCUSSION

To our knowledge, this is the first reported national survey of anesthesiology faculty's understanding of and preference for AL techniques, with a focus on FC. Over half of the participating faculty had some knowledge of AL techniques, and 87% of those had incorporated them into their teaching practice. A similar percentage of faculty expressed understanding of FC, but just over half who knew of the technique utilized it in their practice. Regardless of the baseline knowledge of FC, the majority of faculty were interested in further education regarding this teaching method.

There is a clear discrepancy between faculty knowledge, application, and desire to learn more about FC. Of the 244 respondents, 57% expressed understanding of the FC technique, 32% had utilized FC in the past year, but 89% desired further education on this topic. Although strong evidence of the benefits of FC in GME literature is lacking, there has been work done in undergraduate medical education and other health science fields demonstrating beneficial educational effects including knowledge gain when compared to traditional educational methods.[9–11] These promising results in other areas of health care have led some experts to suggest that FC may be of educational benefit to anesthesiology GME.[6] As the majority of anesthesiology faculty were interested in learning more about the utilization of FC, they too may see potential merit of this educational method in anesthesiology GME. Thus, it would be ideal to offer faculty development opportunities on FC to anesthesiology educators. As there was a wide distribution in participants' baseline knowledge of FC, this education should be offered at both the basic and more advanced levels. Multiple educational forums can be utilized, but this survey suggests that workshops occurring at home institutions are in the greatest demand. As this is not a topic unique to anesthesiology, perhaps workshops can be done at the institutional level for multiple areas of GME. Grand rounds at the departmental level was also highly requested. Local experts at the institution or external experts can be utilized to run such workshops and deliver grand rounds. There was also appeal for online training, which may reach a broader audience. Institutional support for faculty may promote FC education as well as increase its utilization, as many faculty expressed discomfort with the technological components of FC. This support could come in the form of mentorship from experts within the institution and technological support.

An important aspect of the FC model is the AL component that occurs in the classroom after learners acquire knowledge through self-paced learning prior to class. When faculty were surveyed about their knowledge of specific AL techniques, a major knowledge gap pertaining to the think-pair-share technique was revealed: This technique, along with games and role play, was reported to be poorly compatible with respondents' teaching styles. As these practices are all applicable to FC and AL, more fundamental education in these specific areas as well as demonstration on their application may also increase faculty's comfort with FC.

In addition to training on FC technique, there also needs to be education on how to break down barriers in the utilization of FC, as roughly half of the participants that understood the FC technique have actually utilized it in their own teaching practices. Some reported barriers were related to the educators, as most respondents were more comfortable delivering traditional slide-based lectures and were uncomfortable applying the necessary technology to implement FC. These barriers could presumably be decreased with faculty education on FC and through technological support. Another concern was the educators' perceived time commitment for preparation of the first delivery of a FC session. This barrier might seem less onerous once faculty receive training on and support for this teaching method. The other major barriers pertained to the learners. Although faculty thought their learners would like this technique (suggested to be true based on other health professions literature[9,10,12]), they still feared that learners wouldn't come prepared and wouldn't participate. This is likely a realistic concern as compliance in FC learning environments has been shown to be an issue.[13]

The most significant limitation of this survey study is the low response rate. In an attempt to reduce sampling bias, all academic anesthesiologists were invited to participate. As there is no database containing contact information for this specific subgroup of anesthesiologists, the invitation was sent out through the SAAAPM PD's database. In doing so, we relied on the PDs to forward the invitation to their faculty, which poses an additional selection bias to our sample. This reliance on the PDs also allows for the

potential of overestimating the response rate if a PD forwarded the email on without reporting having done so. In addition to repeating the survey through the SAAAPM LISTSERV, it would be worthwhile to utilize additional educator databases, such as the Society of Education in Anesthesia membership, which likely has a complementary list of anesthesiology faculty educators. We did not find any difference between the early and late responders in terms of gender, generation, or years of faculty experience. However, our response bias analysis did determine unequal geographic distribution, for which the authors can posit no explanation.

CONCLUSIONS

Our survey found a discrepancy between faculty knowledge of FC and usage of this method in anesthesiology resident teaching. Perceived barriers with implementation of this educational technique included faculty's lack of comfort with the FC teaching method and the technology needed to implement it, along with concern of residents' compliance with the FC learning protocol. Educational leaders should review these findings to determine the next steps with respect to FC education in anesthesiology GME.

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Susan M. Martinelli is an Associate Professor of Anesthesiology and the Associate Residency Program Director, Fei Chen is an Educational Specialist, and David A. Zvara is a Professor of Anesthesiology and the Chairman of the Department of Anesthesiology at the University of North Carolina School of Medicine in Chapel Hill, NC.

Matthew D. McEvoy is an Associate Professor of Anesthesiology and the Vice Chair of Educational Affairs at Vanderbilt University Medical Center in Nashville, TN. Randall M. Schell is a Professor of Anesthesiology and the Vice Chair of Education at the University of Kentucky in Lexington, KY. Corresponding author: Susan M Martinelli, MD, University of North Carolina, 101 Manning Dr, Campus Box 7010, Chapel Hill, NC, 27599-7010, Telephone: (919) 966-5136, Fax (919) 966-4873. Email address: smartinelli@aims.unc.edu

Key Words: flipped classroom, anesthesiology, graduate medical education, survey

Abstract

Background: Flipped classroom (FC) is an active learning (AL) technique thought to have potential benefits in anesthesiology resident education. This survey aimed to determine the frequency of FC utilization, barriers of utilization, and means to overcome these barriers.

Method: A web-based questionnaire was developed to survey anesthesiology faculty on their knowledge of and experience with FC. The Society of Academic Associations of Anesthesiology and Perioperative Medicine sent the survey to all United States core program directors (PD) via their list serve with a request for the PDs to forward the survey invitation to their clinical faculty. Descriptive statistics were summarized.
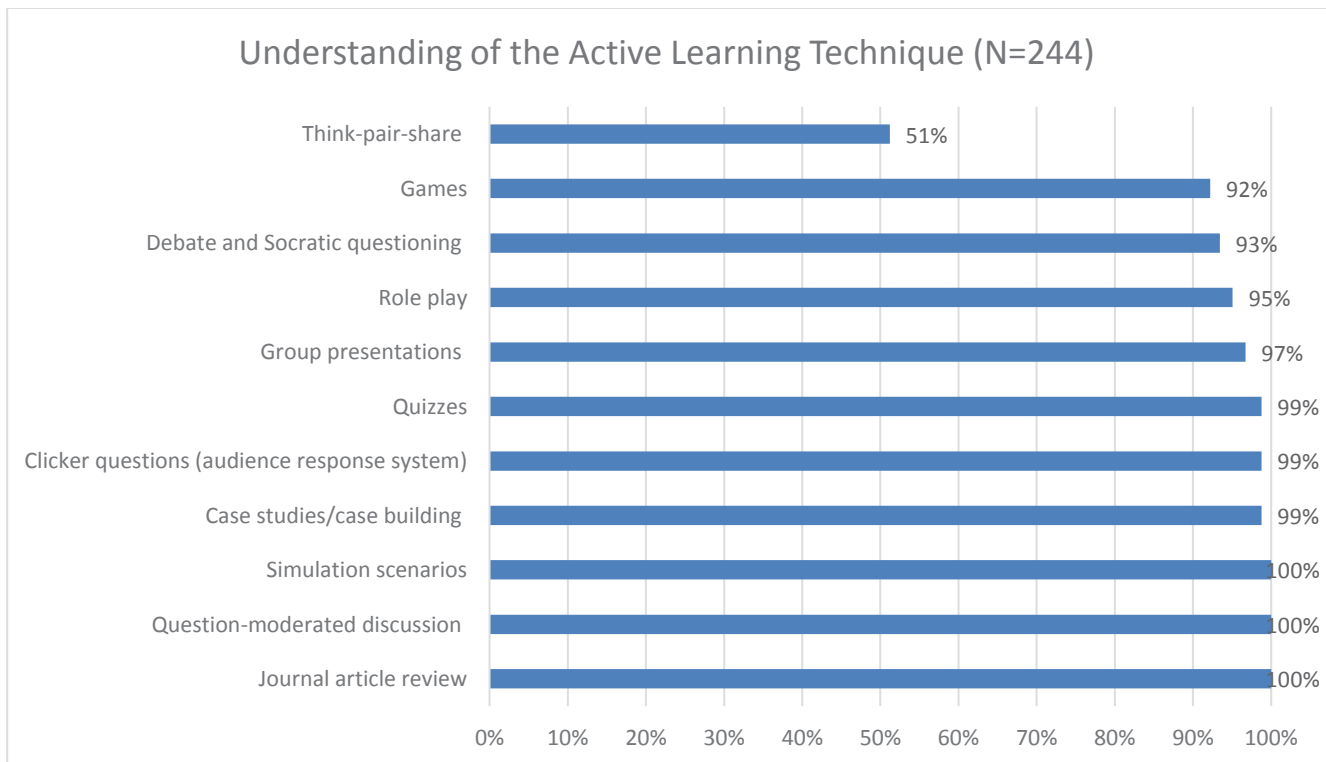
Results: A total of 244 anesthesiology faculty completed the survey. Reported faculty understanding of AL and FC were 57%. Of these faculty, 87% utilized AL and 57% utilized FC in their personal teaching practice during the past year (spring 2015–spring 2016). The most prevalent barriers to utilization of FC were faculty concern that learners would not come to class prepared or participate in class, faculty comfort with delivering traditional lectures, lack of faculty knowledge of necessary technological tools, and faculty concern about perceived increase in time needed to create a FC session. Eighty-nine percent of all faculty desired education on FC with preference for institutional workshops or grand rounds.

Conclusions: Our survey found a discrepancy between faculty knowledge of FC and usage of this method in anesthesiology resident teaching. More educational resources are warranted to address barriers and familiarize faculty with FC applications in anesthesiology resident education.
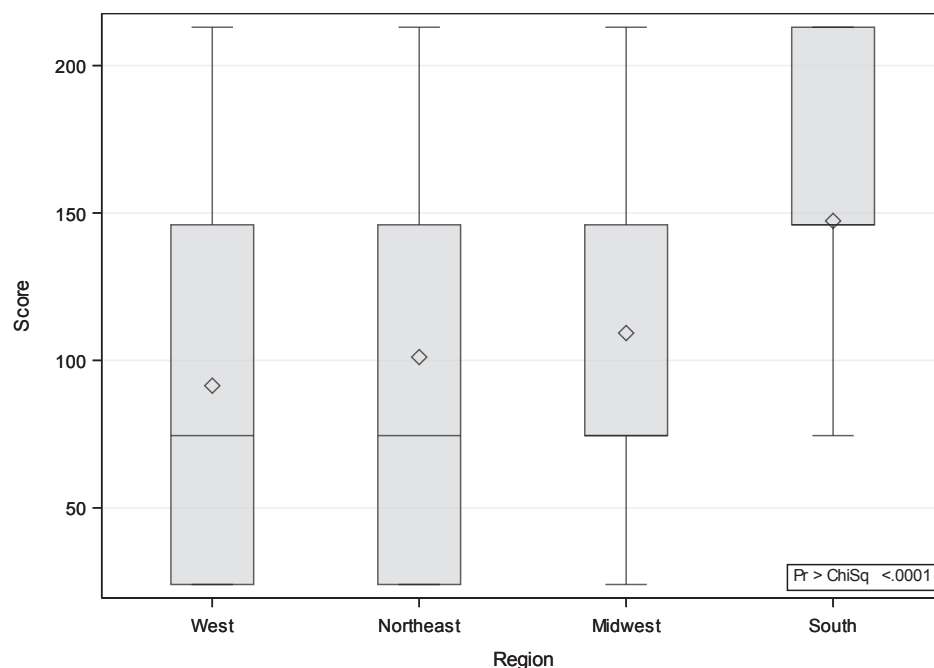
Figures

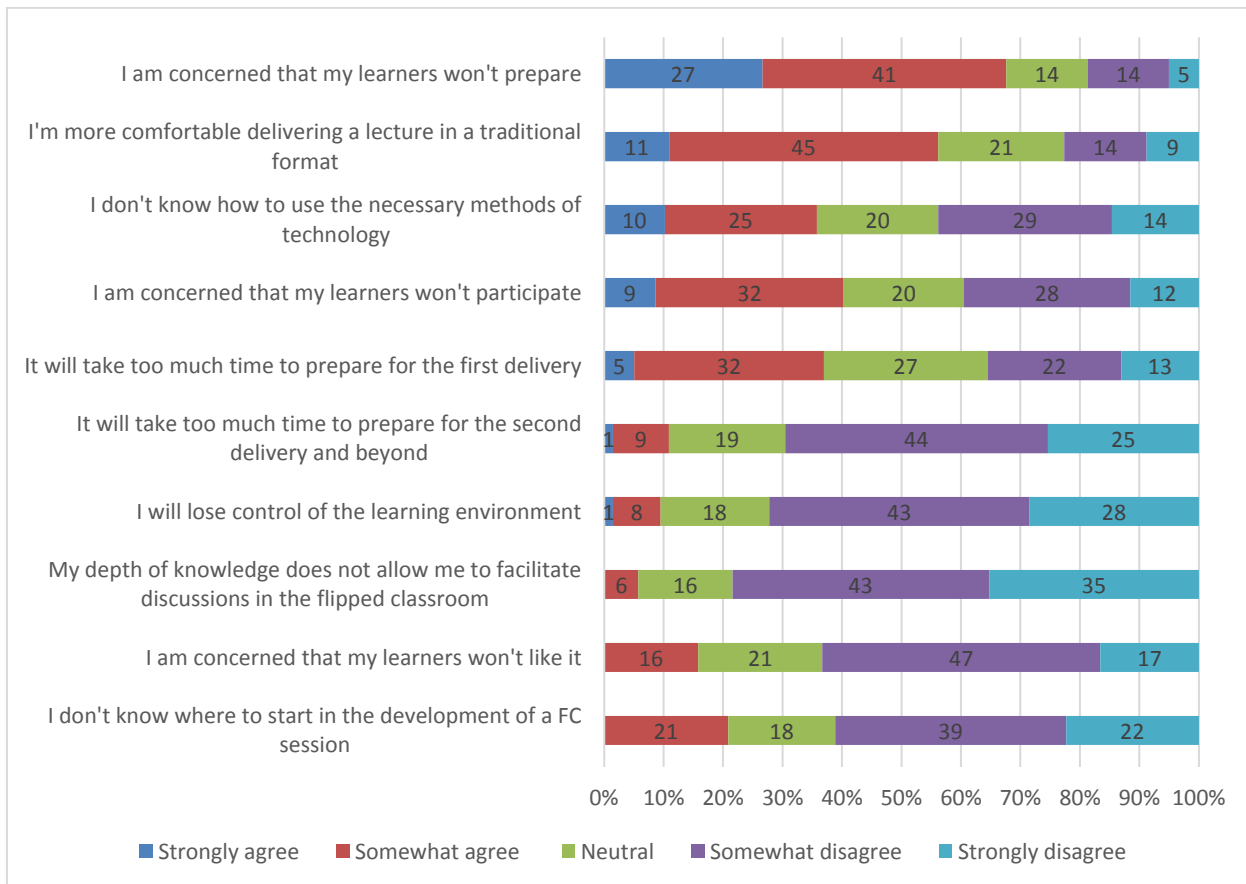**Figure 1.** *Percentage of participants who had knowledge of the specific active learning method (N = 244).*

Understanding of the Active Learning Technique (N=244)

Think-pair-share — 51%
Games — 92%
Debate and Socratic questioning — 93%
Role play — 95%
Group presentations — 97%
Quizzes — 99%
Clicker questions (audience response system) — 99%
Case studies/case building — 99%
Simulation scenarios — 100%
Question-moderated discussion — 100%
Journal article review — 100%

Figure 2. *Box plot of Wilcoxon scores for knowledge of flipped classroom classified by region.*

Y-axis (Score) indicates the Wilcoxon rank score for knowledge of flipped classroom. The symbol marker indicates mean, with a mean rank score of 91.43 for West, 101.13 for Northeast, 109.29 for Midwest, and 147.32 for South. The line inside box indicates median. The upper and lower edges of box indicate third quartile and first quartile, respectively. The endpoints of upper and lower whiskers indicate maximum and minimum.

Pr > ChiSq   <.0001

Figures *continued*

Figure 3. *Perception of barriers to using flipped classroom in anesthesiology resident education (n = 139).*

|	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
I am concerned that my learners won't prepare	27	41	14	14	5
I'm more comfortable delivering a lecture in a traditional format	11	45	21	14	9
I don't know how to use the necessary methods of technology	10	25	20	29	14
I am concerned that my learners won't participate	9	32	20	28	12
It will take too much time to prepare for the first delivery	5	32	27	22	13
It will take too much time to prepare for the second delivery and beyond	1	9	19	44	25
I will lose control of the learning environment	1	8	18	43	28
My depth of knowledge does not allow me to facilitate discussions in the flipped classroom		6	16	43	35
I am concerned that my learners won't like it		16	21	47	17
I don't know where to start in the development of a FC session		21	18	39	22

Figure 4. *Preferred forums of flipped classroom faculty education (N = 244).*

Workshop at my institution	50%
Grand rounds	38%
Podcasts, YouTube, or individual online training	33%
Personal reading	31%
Workshop at a meeting	26%
Lectures other than grand rounds	23%
Other	2%
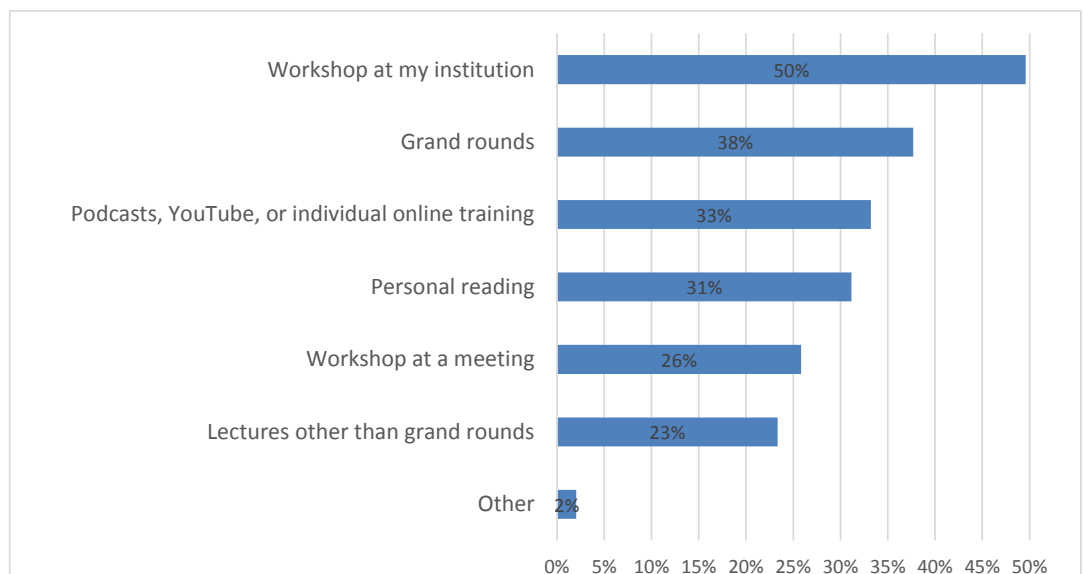
Figures *continued*

Figure 5. *The active learning techniques perceived compatible with participant teaching styles (N = 244).*
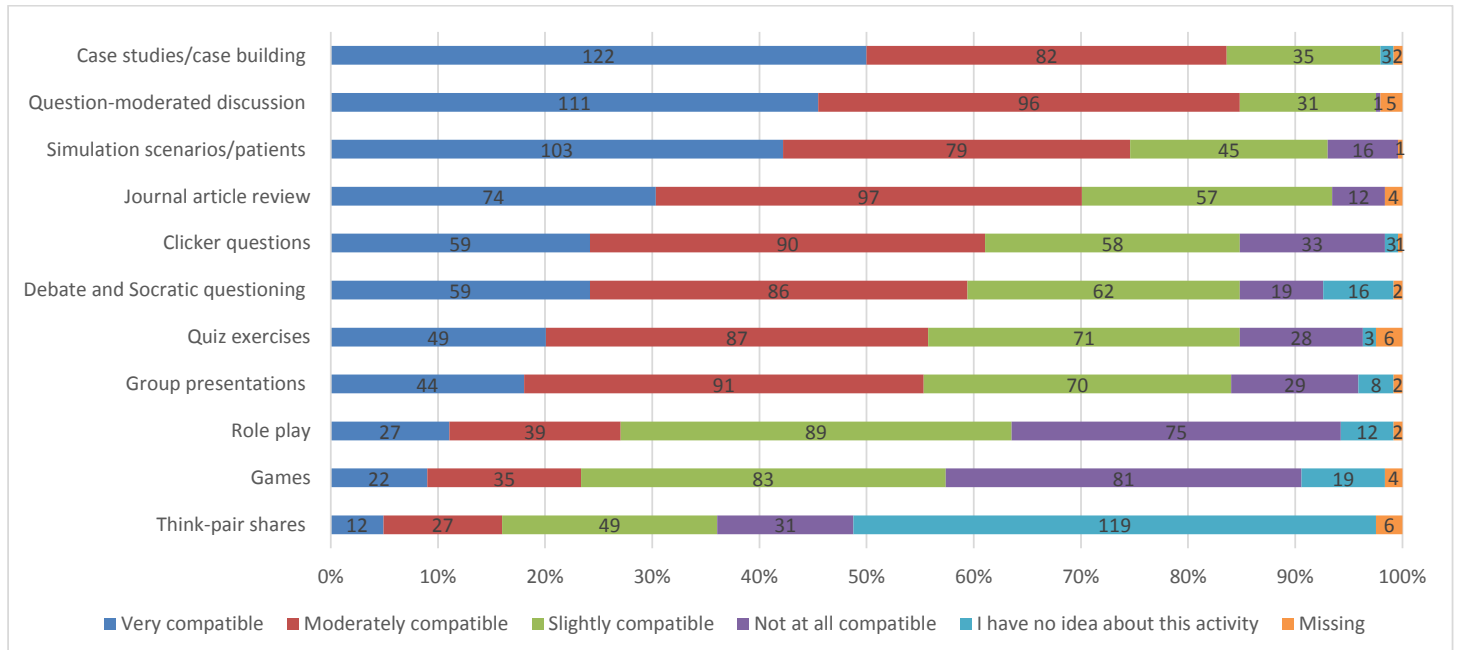
Tables

Table 1. Participant demographics

	Frequency	Percent
Region		
Midwest	63	25.82
Northeast	61	25.00
South	81	33.20
West	30	12.30
NA	9	3.69
Gender		
Male	142	58.20
Female	93	38.11
NA	9	3.69
Generation		
Baby boomers (<=1960)	57	23.36
X (1961-1981)	153	62.70
Y (1982-2005)	32	13.11
NA	2	0.82

Note: NA: Nine participants did not provide their region and gender information. One participant did not provide information of year of birth. One participant provided impossible value of year of birth (i.e., 2016)

Table 2: Faculty usage forum of the flipped classroom.

FC Usage Forum (n=139)	Frequency	Percentage
Did not use	60	43%
Grand Rounds	3	2%
Didactic lectures other than Grand Rounds	70	50%
Own institutions	11	8%
Workshop at a Meeting	5	4%
Other forums	5	4%

Note: Participants were allowed to select more than one usage forum, thus the total frequency is larger than n=139.

Appendix

Educational Methods in Graduate Medical Education Survey

Please complete the survey below.

Thank you!

Approximately how many interns/PGY-1s do you currently have in your department's residency program?	⚪ None ⚪ Less than 5 ⚪ 5 - 10 ⚪ 11 -15 ⚪ More than 15
Excluding interns/PGY1s, approximately how many residents do you currently have in your department's residency program?	⚪ Less than 20 ⚪ 20 - 50 ⚪ More than 50
Within the past year, did you personally do any presentations or lead any educational sessions with residents?	⚪ Yes ⚪ No
How much do you know about the flipped classroom model of learning?	⚪ I have never heard the term "flipped classroom" ⚪ I have heard of it but don't really know what it is ⚪ I have a pretty good idea of it ⚪ I have a solid understanding of it
Have you received any training or education or done any self directed learning on the flipped classroom model?	⚪ Yes ⚪ No
In what forum(s) have you received training or education in the flipped classroom model? (Please select all that apply)	☐ Grand rounds ☐ Other lectures ☐ Workshop at my institution ☐ Workshop at a meeting ☐ Personal reading ☐ Podcast, Youtube, or individual online training ☐ Other
You chose other, please explain.	_____
Within the past year, have you used the flipped classroom model in your own teaching practice?	⚪ Yes ⚪ No
In what forum(s) have you used the flipped classroom model? (Please select all that apply)	☐ Grand rounds ☐ Other resident session(s) ☐ Workshop at my institution ☐ Workshop at a meeting ☐ Other
You chose other, please explain.	_____

Appendix *continued*

Some people believe there are challenges in using the flipped classroom model. Please tell us how you feel about each of the statements below.

	1. Strongly disagree	2. Somewhat disagree	3. Neutral	4. Somewhat agree	5. Strongly agree
I don't know where to start in the development of a flipped classroom session	○	○	○	○	○
It will take too much time to prepare for the first delivery	○	○	○	○	○
It will take too much time to prepare for the second delivery and beyond	○	○	○	○	○
I'm more comfortable delivering a lecture in a traditional format	○	○	○	○	○
I don't know how to use the necessary methods of technology (i.e. creating video)	○	○	○	○	○
I am concerned that my learners won't like it	○	○	○	○	○
I am concerned that my learners won't participate	○	○	○	○	○
I am concerned that my learners won't prepare	○	○	○	○	○
I will lose control of the learning environment	○	○	○	○	○
My depth of knowledge does not allow me to facilitate discussions in the flipped classroom	○	○	○	○	○
The flipped classroom model is easy for me to use	○	○	○	○	○

Please list other challenges that may not have been mentioned above.

_____

(Please specify)

How interested are you in learning more about using the flipped classroom model of teaching?

○ Not interested at all
○ Slightly interested
○ Moderately interested
○ Very interested

Please choose the forum(s) in which you would like to learn about the flipped classroom model. (Choose all that apply)

☐ Grand rounds
☐ Other lectures
☐ Workshop at my institution
☐ Workshop at a meeting
☐ Personal reading
☐ Podcast, Youtube, or individual online training
☐ Other

Appendix *continued*

You chose other, please explain.

_____

How much do you know about active learning?

○ I have never heard the term "active learning".
○ I have heard of it but don't really know what it is
○ I have a pretty good understanding of it
○ I have a solid understanding of it

Within the past year, have you used active learning in your own teaching practice?

○ Yes
○ No

Please list the reason(s) why you have not used active learning.

_____

Please describe the active learning strategies you use have used in your resident education sessions.

_____

How compatible is each of the following activities with your own teaching style?

	I have no idea about this activity	Not at all compatible	Slightly compatible	Moderately compatible	Very compatible
Case studies/case building	○	○	○	○	○
Simulation scenarios/patients	○	○	○	○	○
Question-moderated discussion	○	○	○	○	○
Role play	○	○	○	○	○
Games	○	○	○	○	○
Think-pair shares	○	○	○	○	○
Group presentations by the learners	○	○	○	○	○
Journal article review	○	○	○	○	○
Debate and Socratic questioning	○	○	○	○	○
Quiz exercises	○	○	○	○	○
Clicker questions (audience response system)	○	○	○	○	○

Appendix *continued*

Please answer all of the questions. If you are uncertain of or neutral about your response, select "Neither Agree nor Disagree."

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I can learn technology easily	○	○	○	○	○
I keep up with important new technologies	○	○	○	○	○
I know about a lot of different technologies	○	○	○	○	○
I have the technical skills I need to use technology	○	○	○	○	○
I know how to assess student performance in a classroom setting	○	○	○	○	○
I can adapt my teaching based upon what students currently understand or do not understand	○	○	○	○	○
I can adapt my teaching style to different learners	○	○	○	○	○
I can use a wide range of teaching approaches in a classroom setting	○	○	○	○	○
I have sufficient knowledge about the content I teach	○	○	○	○	○
I have various ways and strategies of developing my understanding of my medical specialty	○	○	○	○	○
I can choose technologies that enhance the teaching approaches for a lesson	○	○	○	○	○

Appendix *continued*

Please answer all of the questions. If you are uncertain of or neutral about your response, select "Neither Agree nor Disagree."

I can choose technologies that enhance students' learning for a lesson	○	○	○	○	○
I am thinking critically about how to use technology in my classroom	○	○	○	○	○
I can adapt the use of the technologies that I am learning about to different teaching activities	○	○	○	○	○
If required to prepare a video as a component of resident didactics, I feel my ability to do so is excellent	○	○	○	○	○
I know how to select effective teaching approaches to guide student thinking and learning in my specialty	○	○	○	○	○
I know about technologies that I can use for understanding my medical specialty	○	○	○	○	○
I can teach lessons that appropriately combine content, technologies, and teaching approaches	○	○	○	○	○
I can choose technologies that enhance the content for a lesson	○	○	○	○	○
I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn	○	○	○	○	○
I can provide leadership in helping others to coordinate the use of content, technologies, and teaching approaches in my program.	○	○	○	○	○

Please answer all of the questions.

What is your gender?   ○ Female
                           ○ Male

Please indicate the year of your birth: _____

Appendix *continued*

Primary state in which you practice:

- ◯ Alabama
- ◯ Alaska
- ◯ Arizona
- ◯ Arkansas
- ◯ California
- ◯ Colorado
- ◯ Connecticut
- ◯ Delaware
- ◯ District of Columbia
- ◯ Florida
- ◯ Georgia
- ◯ Hawaii
- ◯ Idaho
- ◯ Illinois
- ◯ Indiana
- ◯ Iowa
- ◯ Kansas
- ◯ Kentucky
- ◯ Louisiana
- ◯ Maine
- ◯ Maryland
- ◯ Massachusetts
- ◯ Michigan
- ◯ Minnesota
- ◯ Mississippi
- ◯ Missouri
- ◯ Montana
- ◯ Nebraska
- ◯ Nevada
- ◯ New Hampshire
- ◯ New Jersey
- ◯ New Mexico
- ◯ New York
- ◯ North Carolina
- ◯ North Dakota
- ◯ Ohio
- ◯ Oklahoma
- ◯ Oregon
- ◯ Pennsylvania
- ◯ Rhode Island
- ◯ South Carolina
- ◯ South Dakota
- ◯ Tennessee
- ◯ Texas
- ◯ Utah
- ◯ Vermont
- ◯ Virginia
- ◯ Washington
- ◯ West Virginia
- ◯ Wisconsin
- ◯ Wyoming

Please indicate your medical specialty

- ◯ Anesthesiology
- ◯ Internal Medicine
- ◯ Pediatrics
- ◯ Surgery
- ◯ Internal Medicine and Pediatrics (Med-Peds)
- ◯ Other

Please list "other" specialty.

_____

Appendix *continued*

How many years have you been on faculty at an academic institution?

○ 1 or less
○ 2
○ 3
○ 4
○ 5
○ 6
○ 7
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○ 50

Thank you for completing this survey. If you want to be entered into the drawing for one of ten $250 VISA gift cards, please enter your email address.

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