There is a movement in medical education to promote active learning techniques over traditional lectures. Active learning describes a variety of approaches, including workshops, online modules, team-based learning, and flipped classrooms. Active learning is designed to maximize student engagement, requires self-directed learning, and teaches lifelong learning skills. These student-centered methods may require evaluating learners prior to a session, and adjusting the content to best meet learners’ needs. It is resource intensive to design and facilitate an active learning curriculum.

A meta-analysis of 225 studies reported that active learning in universities improved student performance and reduced odds of failing. However, evaluation of active learning methods in medical education has yielded equivocal results. Studies with medical students have shown active learning modules result in similar knowledge gain as traditional methods, or similar knowledge gains but improved application skills. Student satisfaction with active learning is variable. Reasons cited for low student satisfaction include the perception that lectures are more efficient, and frustration caused by inconsistent faculty quality or inadequate preparation by peers.

Despite these mixed results, the incorporation of active learning is mandated by curriculum oversight authorities. This study evaluated how clerkship directors are implementing active learning, what challenges they face, and what resources, including faculty time, may facilitate this transition.

**Methods**

**Survey**

Data were gathered as part of the 2020 Council of Academic Family Medicine’s (CAFM) Educational Research Alliance (CERA) survey of...

**From Saint Louis University School of Medicine, St Louis, MO.**
family medicine clerkship directors distributed annually to clerkship directors at accredited North American medical schools.8 The survey was emailed to 147 US and 16 Canadian family medicine clerkship directors in June 2020, using SurveyMonkey. Nonrespondents received multiple reminders. The American Academy of Family Physicians Institutional Review Board approved this study in May 2020.

**Survey Questions**

Participants answered questions regarding percent time as clerkship director, whether their department had a nonphysician educator or physician who completed education training, number of teaching faculty, hours of didactics, hours of active learning methods, types of active learning methods, and challenges to adoption of active learning.

**Analyses**

We summarized study variables using descriptive statistics. Bivariate correlations determined associations between number of teaching faculty, percent time as clerkship director, and time spent using active learning methods. We defined active learning as any method other than large group lecture. We calculated the percent of time teaching active learning by dividing the number of hours spent using active methods in both large group and small group settings by the total number of didactic hours. We used a t test to determine whether there were differences in time teaching using active learning methods if the department had a faculty member with training in education.

**Results**

A total of 105 of 163 clerkship directors responded, for a response rate of 64.4%. Descriptive statistics are presented in Table 1. Sixteen respondents did not complete the survey and were removed. Correlations showed that the number of teaching faculty was positively associated with the percent of didactic time spent using active learning, but not with percent time using online modules. No significant correlations were found between clerkship director full-time equivalent (FTE) and percent time using active learning methods or online active learning (Table 2). t test showed departments with an educator did not spend a greater percentage of their time (46.9%) on active learning than departments without an educator (51.5%, P=.478). t tests also showed no associations between number of teaching faculty and type of active learning methods used (Table 3).

When asked about challenges clerkship directors faced, 33.7% reported lack of resources and 28.1% said their students were too geographically dispersed to adopt active learning methods, but 43.8% reported they adopted active learning methods without major challenges. Only 7.9% said they didn’t have the expertise to adopt active learning methods.

**Discussion**

The more teaching faculty a department had, the more didactic time they spent using live active learning methods. However, the number of teaching faculty was not associated with time spent using online active learning methods. Perhaps larger departments can spend more faculty time in either large- or small-group active learning rather than using online modules, which require little faculty time. Although most respondents had adopted some learning methods, approximately one-third felt challenged by a lack of resources. Major challenges of some active learning methods are the amount of time to prepare for them and the faculty required to teach them.9

| Table 1: Descriptive Statistics of Study Variables |
|--------------------------------------------------|
| **Percent of Clerkships Using Method** |
| Online modules | 71.9 |
| Problem-based learning/case-based learning | 70.8 |
| Hands-on workshops/demonstrations | 57.3 |
| Flipped classroom | 49.4 |
| Team-based learning | 38.2 |
| Games | 32.6 |
| Audience response system | 30.3 |
| Did not adopt active learning methods | 3.4 |
| Have educator in department | 59.6 |
| **Mean (SD)** |
| Number of teaching faculty | 7.8 (6.6) |
| Percent time as clerkship director | 31.5 (14.2) |
| Percent of didactic time spent in large or small group active learning | 48.8 (30.1) |
| Percent of didactic time spent on online active learning | 39.3 (38.8) |
less faculty burden than small-group teaching. Neither the presence of an educator nor the FTE dedicated to the clerkship director role were associated with time spent using active learning. Changing those variables is not likely to influence the adoption of active learning.

This study did not inquire about specific technology needs for adopting active learning. These may include the presence of a technology specialist, adequate hardware such as cameras or laptops, or the availability of high-speed internet in remote locations. As online resources become more ubiquitous and user friendly, the technology burden to the medical school may decrease. However, many of these resources require subscription fees that must be borne by the institution or students. One area for future research is the added cost of subscription fees and the perceived utility to medical students.

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Table 2: Pearson Correlations Comparing Percent Time as Clerkship Director and Number of Teaching Faculty to Percent Time Teaching Using Active Learning Methods

| Percent Time as Clerkship Director | Number of Teaching Faculty |
|-----------------------------------|---------------------------|
| Percent time active learning (not online) | .074 | .271* |
| Percent time online active learning | .114 | -.158 |

*P value significant at .05 level.

Table 3: Associations Between Number of Teaching Faculty and Active Learning Methods Used

| Method Used | Method Not Used | P Value |
|-------------|----------------|---------|
| TBL         | 8.5 (4.9)      | 7.4 (7.5) | .459 |
| Flipped classroom | 9.0 (7.3)      | 6.6 (5.7) | .085 |
| PBL/CBL     | 8.3 (6.0)      | 6.5 (8.0) | .254 |
| Workshops   | 8.7 (6.6)      | 6.7 (6.6) | .164 |
| Audience response system | 9.7 (6.0)     | 7.0 (6.8) | .08 |
| Games       | 8.9 (6.2)      | 7.3 (6.8) | .267 |
| Online modules | 7.0 (3.9)     | 9.8 (10.9) | .232 |

Abbreviations: TBL, team-based learning; PBL, problem-based learning; CBL, case-based learning.