

# Cross-institutional Virtual Mock Oral Examination: A New Paradigm?

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**Background:** Mock oral examinations (MOEs) are shown to be valuable in preparation for national board oral examinations. Although traditionally conducted in-person, improved technological advances have supported exploring virtual alternatives. Furthermore, the coronavirus disease 2019 pandemic has necessitated virtual learning. We hypothesized that the virtual platform would improve and expand the MOE experience to include collaborative institutions while approximating a board examination environment.

**Methods:** Sixteen senior plastic surgery residents and 14 faculty from three separate programs participated in a cross-institutional virtual MOE. Over a single day, each trainee was evaluated by two faculty from a separate institution on six scenarios, including digitally interactive photographs. Immediate postexamination debriefing with feedback was performed. All participants were subsequently invited to complete an anonymous survey regarding MOE experience, accuracy, and stress level, with responses graded on a Likert scale (1–5).

**Results:** Twenty-three participants completed the survey, with 87% having prior MOE experience; however, only 26.1% of participants had virtual MOE experience. Most found the virtual platform more convenient (4.18 + 1.18; 5—far more convenient, 1—far less convenient) and less stressful (2.32 + 0.65; 5—far more stressful, 1—far less stressful) than in-person. All participants found the examination fair, and participants found the examination valuable (4.65 + 0.57) in preparing trainees for the American Board of Plastic Surgery oral examination.

**Conclusions:** The majority of participants found the virtual MOE experience valuable and comparable to in-person. These results reinforce that a virtual MOE provides an acceptable alternative with greater convenience and improved cross-institutional collaborative efforts. (*Plast Reconstr Surg Glob Open* 2023; 11:e4822; doi: 10.1097/GOX.0000000000004822; Published online 17 February 2023.)

## INTRODUCTION

Since the establishment of the American Board of Surgery in 1937, there has been a national focus on assessing and certifying trainees with a comprehensive, standardized examination.<sup>1</sup> Over the years, in several specialties, including plastic surgery, this has evolved into two parts: a written qualifying examination and an oral certifying examination. Although national in-service examinations have sought to prepare trainees for the written examination, the closest equivalent for the certifying

examination are mock oral examinations (MOEs) typically conducted by individual institutions.<sup>2,3</sup> Traditionally, MOEs have been administered in an in-person format at trainees' home institutions or occasionally at regional/national society meetings. These examinations allow residents to become better acquainted with the pacing, format, and style of questions asked on the board examination.<sup>4</sup> Additionally, MOEs improve trainees' comfort level with the examination and decrease testing anxiety.<sup>5</sup> Although MOEs are typically conducted in-person, improved technological advances have supported exploring virtual alternatives.<sup>6</sup> This exploration is made more pressing due to restrictions placed by the coronavirus disease 2019 pandemic.

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With the onset of the pandemic, traditional academic teaching and instruction has been disrupted worldwide, necessitating new, progressive platforms for virtual teaching. Restrictions on in-person gathering hinder traditional in-person administration of MOEs. Past studies have shown the value and effectiveness of virtual MOEs in other medical fields such as general surgery, radiation oncology, and otolaryngology; however, no such study exists yet in plastic surgery.<sup>7-9</sup> Without the logistical constraints of physical coordination, we hypothesized that the virtual platform would improve and expand the MOE experience to include collaborative institutions while still approximating a board examination environment.

## METHODS

Participants included senior residents and faculty from three separate plastic surgery training programs: University of Texas Health Science Center at Houston, Houston Methodist Institute, and Baylor College of Medicine. Senior plastic surgery residents constituted trainees in their final 2 years of training.

Six clinical cases used for the MOE were solicited from faculty examiners, who do not normally conduct examinations for the American Board of Plastic Surgery (ABPS). They were instructed on directing the scenario, as well as criteria that constituted appropriate management. The six cases (which covered core plastic surgery curricula topics such as hand surgery, pediatric craniofacial surgery, oncologic reconstruction, lower extremity trauma, and breast reconstruction) were compiled into a PowerPoint and administered virtually on WebEx (San Jose, Ca.). These PowerPoint presentations included digitally interactive portions with photographs. Examinees were allowed to place markings on clinical photos as needed, using real-time interaction on their personal computers.

Two faculty examiners were appointed to each examinee. To approximate the ABPS Oral Examination, it was ensured that neither of these faculty members were from the same institution as the examinee. The testing session was approximately 60 minutes long, with video and screen sharing on for the duration of the examination. Each clinical scenario was administered for 9 minutes, for a total of 54 minutes. Six minutes were then dedicated for feedback on the examinee's performance. Examinees were graded utilizing a standardized chart and question guide on management of diagnosis and planning, case and treatment, and handling of complications and outcomes. (See appendix 1, Supplemental Digital Content 1, which displays a sample performance rubric for the virtual MOE. <http://links.lww.com/PRSGO/C415>.) (See appendix 2, Supplemental Digital Content 2, which displays a sample question guide for the virtual MOE. <http://links.lww.com/PRSGO/C416>.)

Examinees could receive a pass, marginal, or fail grade for their performance in each scenario. Compiled performance evaluations were sent to plastic surgery program directors for review.

## Takeaways

**Question:** Does a virtual mock oral examination confer the same/improved benefits in comparison to an in-person examination?

**Findings:** We designed a virtual mock oral examination which incorporated three plastic surgery programs, and we collected postexamination surveys to assess trainee and faculty perceptions on the examination/testing environment. We found that the virtual platform was more convenient, less stressful, fair, and viewed as extremely valuable in preparation for the ABPS oral board examination.

**Meaning:** A virtual mock oral examination not only is a viable alternative to traditional in-person examinations for preparing for the ABPS examination, but also better allows for cross-institutional participation.

After the virtual MOE, all participants were asked to complete an anonymous voluntary SurveyMonkey survey assessing the accuracy, usability, and stress levels of the virtual MOE environment.

The survey included 18 questions, with six multiple choice demographic questions and 12 questions about the virtual environment. The demographic questions sought to determine level of training and past experience with oral examinations, including the MOE and ABPS oral examinations. The questions about the virtual environment sought to assess the convenience, stress values, and educational value of the virtual MOE as well as perceived similarity to the ABPS oral examination. Participants were also asked for any suggestions on improvement. Responses to questions about the virtual environment were graded on a Likert scale (1–5). The trainee who had not participated in a prior MOE was excluded from questions comparing virtual and in-person MOEs, and the two attendings who had not previously participated in an MOE compared their experience with the in-person certifying examination.

## RESULTS

A total of 30 participants (six senior plastic surgery residents and 14 attending faculty) took part in the virtual MOE. Twenty-three of 30 participants (76.7%) completed the post-MOE survey, with 87% having prior MOE experience and 69.6% having experience specific to the plastic surgery MOE. However, only 26.1% of participants had experience with a virtual MOE (Fig. 1).

In comparison with in-person, most found the virtual platform more convenient ( $4.18 \pm 1.18$ ; 5—far more convenient, 1—far less convenient) and less stressful ( $2.32 \pm 0.65$ ; 5—far more stressful, 1—far less stressful), with no statistical difference between residents and attendings. All participants found the examination fair and valuable ( $4.65 \pm 0.57$ ; 5—extremely valuable, 1—no significant value) (Fig. 2), with 91.3% of participants strongly recommending future participation (Fig. 3). If given the option between virtual and in-person formats, a majority of faculty (61.5%) still preferred an in-person MOE, whereas only 30% of residents preferred it.

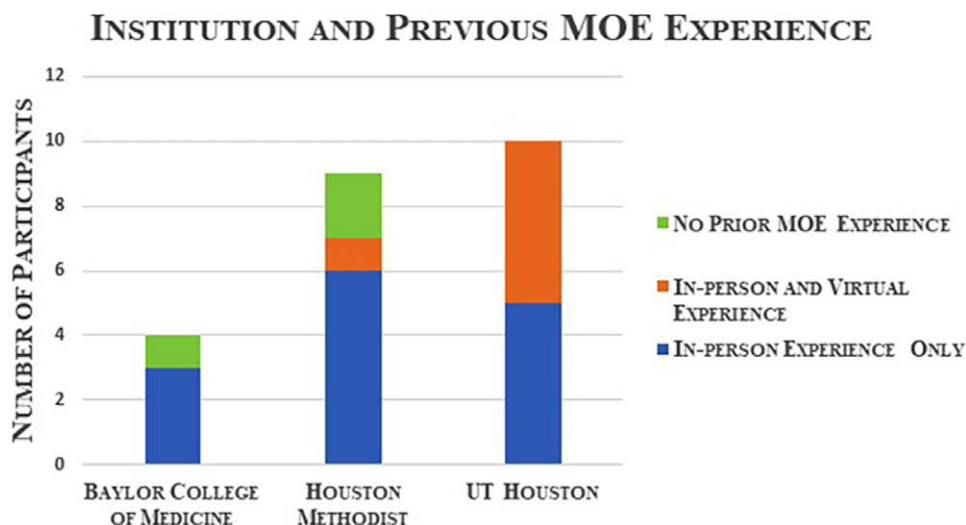


Fig. 1. Breakdown of participants by institution and prior MOE experience.

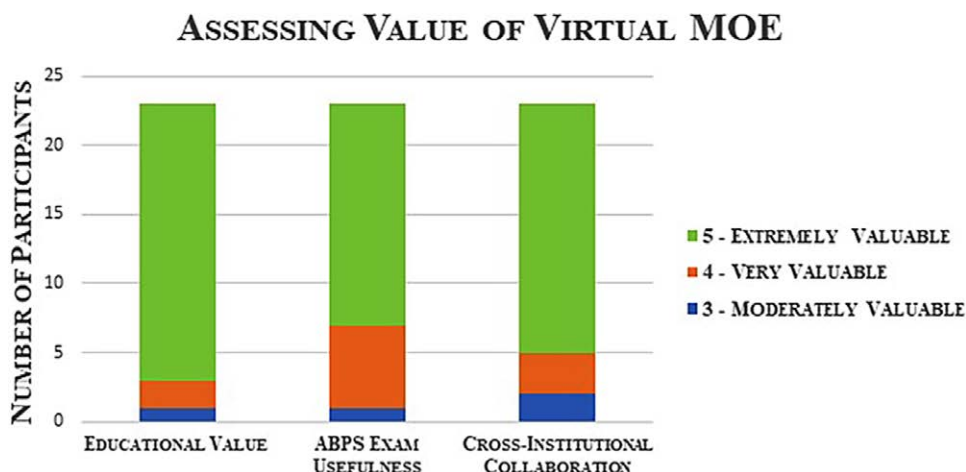


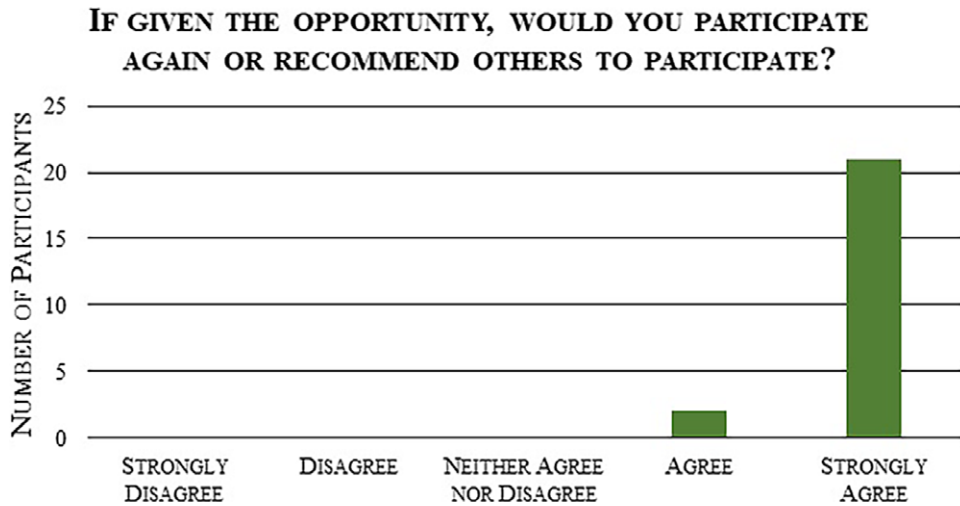
Fig. 2. Twenty participants responded that the virtual MOE was extremely educationally valuable. Sixteen stated it was extremely useful in preparing for the ABPS oral boards. Eighteen reported that working with different institutions’ faculty was extremely valuable.

User experience with virtual technology was significantly positive ( $P = 0.035$ ), with the majority of participants finding the technology, examination quality, and organization to be good or excellent (Fig. 4). All faculty found the results of the virtual MOE valuable for annual resident appraisals. Additionally, nine of 10 residents and 12 of 13 attendings said that working with faculty from different institutions through the virtual MOE was extremely valuable (Fig. 2). All 10 residents and 12 of 13 faculty said that the virtual MOE was very or extremely valuable in helping trainees prepare for the ABPS Board Examinations (Fig. 2).

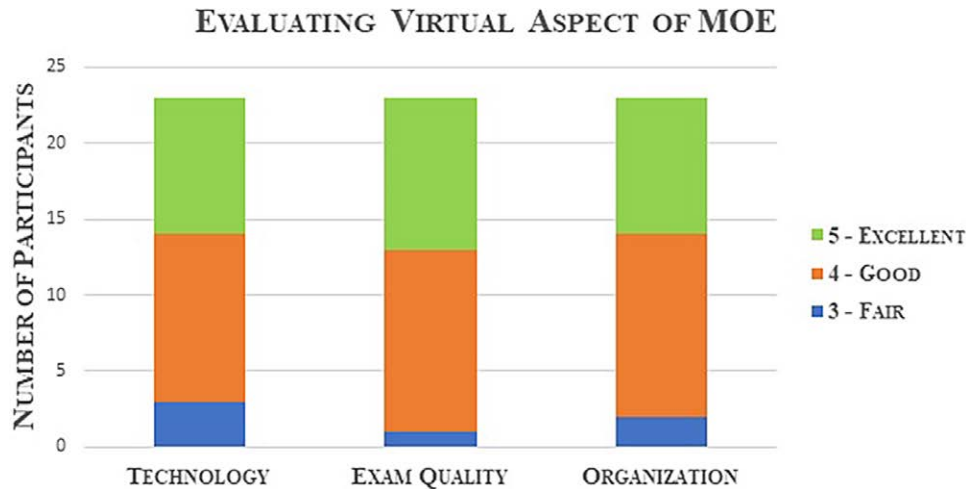
### DISCUSSION

Mock oral examinations have been demonstrated to provide an adequate practice environment for training in a variety of specialties. The literature has demonstrated

that these examinations raise trainees’ comfort levels, boost their confidence, and reduce stress levels for the actual oral board examination.<sup>4,5</sup> With 87% of our participants having previous experience with mock oral examinations, this demonstrates how widely utilized MOEs are. Additionally, residents from the two independent plastic surgery programs tended to have more experience with MOEs than their integrated counterparts. This is expected given these trainees’ prior experience as senior residents in other specialties. Because the majority of participants in general had prior experience with MOEs, this allowed for a more direct comparison between virtual MOEs and in-person. Overall, the virtual platform was well received, with a majority of participants finding the technology, usability, and representation similar to in-person examinations. With essentially all participants eager to use the virtual MOEs again, this does give insight into what the future of the certifying examination may become.



**Fig. 3.** Twenty-one participants strongly agreed that they would participate in the virtual MOE again or recommend others to participate.



**Fig. 4.** In evaluating the virtual aspect of the MOE, the majority of participants found the technology, examination quality, and organization to be good or excellent.

The virtual format also better allows cross-institutional participation. By including participants from other programs, trainees are better able to simulate the certifying examination by being cross examined by faculty who are not at their own institution. This allows multiple benefits, such as reproducing the “unknown” aspect by working through scenarios with faculty trainees they have never worked with before. Additionally, from an educational standpoint, this allows faculty to assess other programs’ trainees and, therefore, gain some insight into where their own trainees are with regard to certifying examination preparedness. This unknown quotient may also limit the implicit bias of familiarity. Furthermore, the virtual format allows smaller programs the opportunity to participate with other programs that they may otherwise lack access to due to locoregional constraints.

Additional advantages of the virtual format also include built-in technological advances. Because video conference applications such as WebEx and Zoom have built in recording capabilities, each mock oral session is easily captured using the virtual platform without the need for additional equipment. This allows for more specific feedback to be delivered to participants and enables both the trainee and home institution to review the videos at a later date. Factors such as body language and speech patterns can be examined and subsequently adjusted to allow for better performance on future MOEs. Furthermore, this allows for better quality control of the sessions; faculty can also be given feedback on how they are conducting the examination. This would enable a more standardized approach among faculty, leveling the playing field, and allowing each participant to receive a similar experience.



Naturally, although there are some clear advantages, there are also some drawbacks to utilizing the virtual format. Participants are subject to fluctuations in connectivity as well as variable computer memory and speeds, all of which may result in a suboptimal video conference session. Furthermore, although most platforms have strived to make their applications simple and user friendly, concepts such as screen sharing and digitally interactive portions may be difficult for the less technologically savvy users. Unsurprisingly, resident participants showed a statistically significant ( $P = 0.035$ ) increase in comfort level with the virtual technology ( $4.60 \pm 0.52$ ; 5—excellent, 1—very poor) than their attending counterparts ( $4.0 \pm 0.71$ ).

Although there are clear benefits to the virtual format, the in-person examination has been the gold standard for decades. In part, the conception of the certifying examination was to establish a national standard that graduates should meet. Because nearly all past graduates have been judged by this in-person standard, it would stand to reason that utilizing the older test method would best be able to determine if graduates meet the board's expectations. Interestingly, in this study, most faculty (62%) still preferred an in-person format, compared with only 30% of residents. However, the most recent certifying examination results would suggest that the virtual format reasonably compares to the in-person counterpart. Since the beginning of the coronavirus disease 2019 pandemic, certifying examinations across specialties have converted to a virtual examination, and plastic surgery has been no exception. The pass rate for the plastic surgery certifying examinations these past two years has been  $88.45\% \pm 1.2\%$  for all-takers and  $88.95\% \pm 1.1\%$  for first-time takers. In comparison, the previous 10 years of in-person examinations resulted in an  $85.86\% \pm 6.4\%$  pass rate for all-takers and  $88.81\% \pm 5.6\%$  for first-time takers. Although this is a relatively small sample size of virtual examination participants, there was no statistically significant difference in pass rates in either category.<sup>10</sup>

One of the major drawbacks to the in-person examination remains the relatively high burden of cost to the trainee. The process for the application and registration for the written and certifying examinations alone cost \$3810.<sup>11</sup> Adding in the cost of travel and basic daily expenses, which can range from \$200 to \$800, as well as hotel costs, which can bring the total to over \$1000, incurs quite the financial burden for trainees of whom 73% have an average of \$200,000 in education debt upon graduating medical school.<sup>12</sup> On the other hand, attending faculty who are participating as examiners not only pay for travel and lodging, but also have the lost revenue from the time off necessary for spending several days out of town at the testing location. Continuing the certifying examination in a virtual format would eliminate the costs associated with travel and lodging; additionally, there could theoretically be less administrative fees, which already comprise a significant portion of the financial burden to trainees.<sup>10</sup>

Overall, there are some clear limitations to this study. Our small sample size, particularly when comparing

attendings and residents, limits the ability to draw statistically significant comparisons between the two groups. Completion of the survey also only included 76.7% of all participants, further limiting the sample size; this was likely due to a time delay between completion of MOE and survey being sent, during which time several residents graduated. Additionally, the nonrandom enrollment process can introduce further bias. Future directions for the study include continued longitudinal collection of data among trainees. This would also include their perceptions on and perceived preparedness for the actual certifying examination. Additionally, future virtual MOEs should encompass additional programs outside the local Houston area, thus capitalizing on the clear advantage in cross-institutional collaboration inherent to the virtual format.

Interestingly, attending physicians were more likely to desire returning to an in-person format, whereas the majority of residents preferred the virtual format. This may represent a paradigm shift in content delivery and assessment, as the desire for convenience continues to be weighed against quality. This paradigm shift may represent a critical change in learner attitudes toward examinations that may last beyond the pandemic.

## CONCLUSIONS

Virtual MOEs can be conducted successfully and can incorporate cross-institutional collaboration. This format confers the benefit of offering examinees a more realistic testing scenario with unfamiliar examiners and open institutional participation without geographic limitations. Furthermore, as official examinations have pivoted to virtual formats, at least in the near term, these virtual MOEs may more accurately prepare the examinee for the certifying examination.

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