

# A Video-Based Coaching Intervention to Improve Surgical Skill in Fourth Year Medical Students

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## Background

- For senior medical students pursuing careers in surgery, specific technical feedback is critical for developing foundational skills in preparation for residency.
- Opportunities to receive directed, technical feedback on surgical skills are time-limited to optimize patient care.
- Video-based coaching is commonplace in other professional fields like athletics for its effectiveness in optimizing technique.
- Video-based interventions to improve skills in surgery have gathered increased attention for their use in faculty quality improvement, as well as outcomes research.

### HYPOTHESES:

- Students who receive a coaching session regarding their technical skills will demonstrate greater improvement compared to students who did not receive the coaching intervention.
- Students will find the coaching sessions informative and enjoyable.

## Methods



	Anchor Descriptors				
Bimanual dexterity	1 Use of one hand, ignoring non-dominant hand, poor coordination between hands	2	3 Use of both hands but does not optimize interactions between hands to facilitate conduct of operation	4	5 Expertly uses both hands in a complementary manner to provide optimal working exposure
Efficiency	1 Uncertain, much wasted effort, many tentative motions, constantly changing focus of operation, or persisting at a task without progress	2	3 Slow, but planned and reasonably organized	4	5 Confident, efficient and safe, maintaining focus on component of procedure until better done by another approach
Tissue Handling	1 Rough, tears tissue by excessive traction, injures adjacent structures, grasper frequently slips off	2	3 Handles tissues reasonably well, with some minor trauma to adjacent tissues	4	5 Handles tissues very well with appropriate traction on tissues and negligible injury of adjacent structures.
Level of Difficulty	1 Easy Difficulty	2	3 Moderate Difficulty	4	5 Extremely Difficult
Consistency	1 Haphazard placement of stitches	2	3 Moderately consistent stitch placement, with some variable spacing	4	5 Consistently spaced stitches throughout

- Students were coached on technique by a faculty member while reviewing a video of their suturing technique.
- Faculty evaluated each video blinded to student identity, baseline vs. follow up, and coached vs. control group
- Evaluation tool used by both students and faculty to grade suturing skills.
- Students self-evaluated after both baseline and follow up suture tasks

## Results

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| <p><b>Positive Comments</b></p> <ul style="list-style-type: none"> <li>“My view is more specific and concrete - much easier to reflect on strengths/areas of weakness.”</li> <li>“I felt more confident in the aspects that I have been doing well, and it showed me more clearly the impact of my inefficiencies.”</li> <li>“Saw and learned about minor changes to technique that can greatly improve efficiency and skills.”</li> <li>“It showed me areas I could improve in small motions that I considered "basic" and easy enough not to notice.”</li> </ul> | <p><b>Suggestions for Improvements</b></p> <ul style="list-style-type: none"> <li>“Doing a running subcuticular stitch, as these are harder and more commonly performed tasks for students.”</li> <li>“Just including more and different technical skills. The more the better!”</li> <li>“I think that offering a similar trainer for subcutaneous closures as well as running closures would be really useful.”</li> <li>“Consider having students watch a master video and then watch their video before meeting with the coach - could help continue to develop our self-reflective skills.”</li> </ul> |
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- Subjective, free response comments from students centered on the following themes:
  - Becoming more aware of non-productive hand movements
  - Benefits of viewing themselves from the camera placed across the table from them- simulating an attending's view
  - The usefulness of the coaching advice moving forward

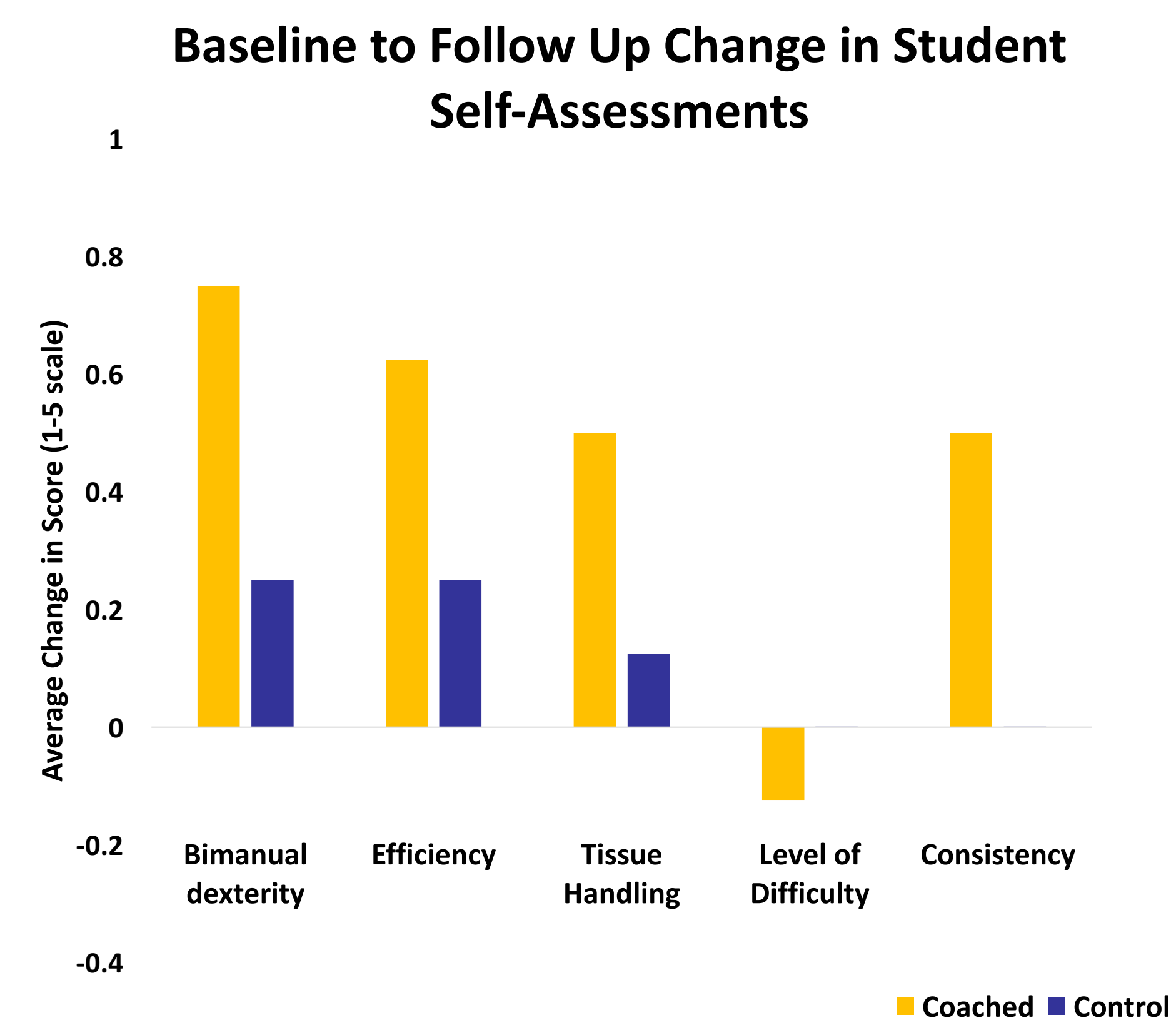
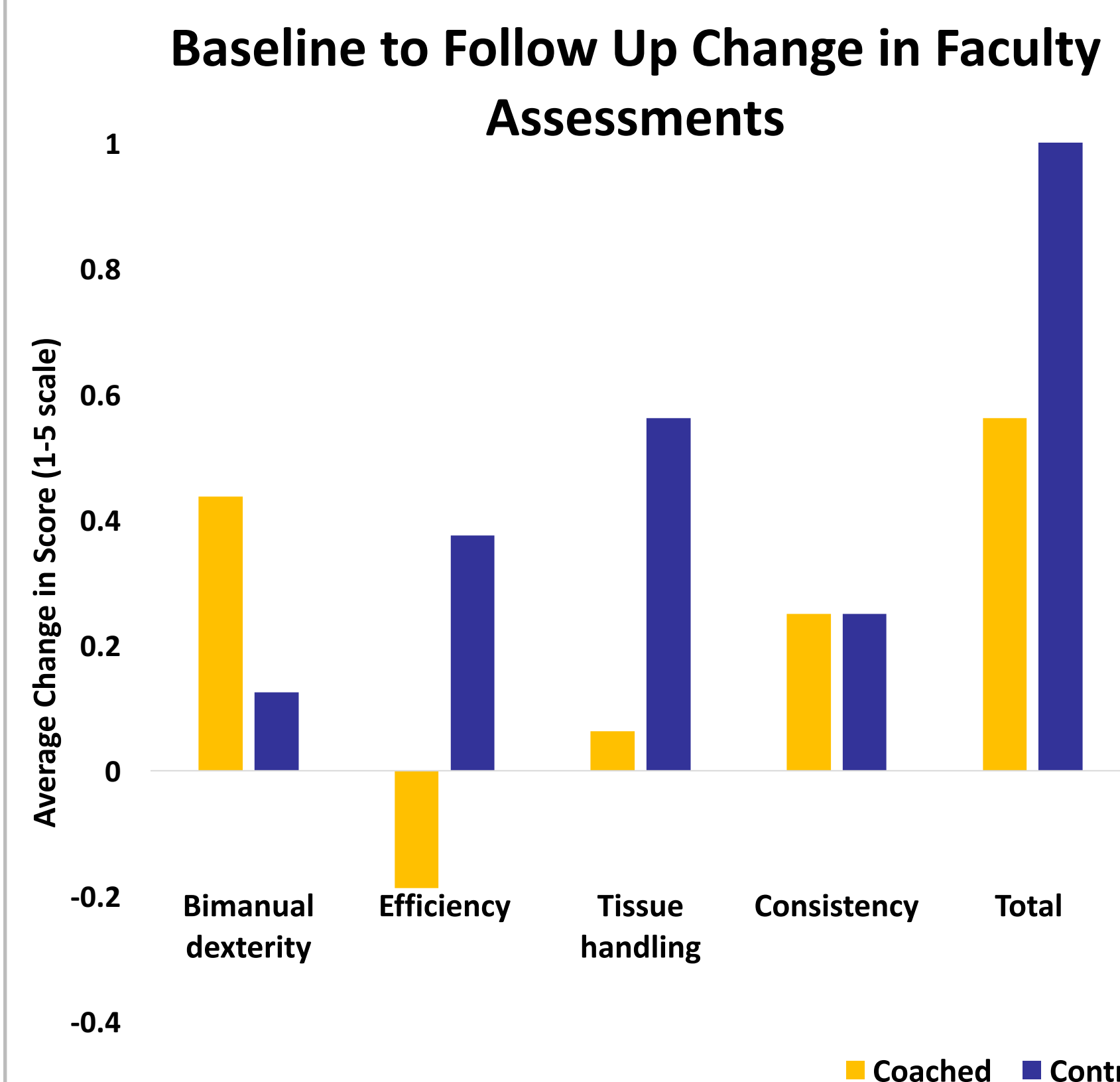
## Methods

- All fourth year medical students pursuing careers in surgical specialties were contacted via email for voluntary participation.
- All students performed a video-recorded suture task for baseline technical skill evaluation.
- Students were randomized to one of two groups:
  - Coached- Students viewed footage of their suture task with a faculty member as part of a technical skills coaching session.
  - Controls- Students were given a break with no coaching intervention.
- Videos were evaluated by independent faculty members to compare baseline vs. follow up technical skills.
- Students evaluated their own suture technique following both baseline and follow up suture tasks.
- University of Michigan IRB approved (HUM00129685).



## Results

Student Perception of Coaching Session (n=16)	Strongly Agree	Somewhat agree	Neither agree or disagree	Somewhat Disagree	Disagree
This was a beneficial experience for me	94%	6%	0%	0%	0%
This experience improved my technical skills	75%	19%	6%	0%	0%
Do you feel that watching the recording of yourself changed your perception of your skill level?	56%	13%	6%	19%	6%
Would you recommend this opportunity for other students?	100%	0%	0%	0%	0%



## Conclusions

- This study demonstrated the feasibility of a video based coaching intervention in undergraduate medical education.
- Coaches and students are able to visualize an extensive field of view while simultaneously appreciating granular details such as appropriate needle loading or the exact placement of stitches in tissue.
- Student self evaluations demonstrate greater subjective self improvements in all graded domains for students who received the coaching intervention compared to controls.
- Based on faculty evaluations, mixed results were observed comparing improvements in coached students versus controls.
- The coaching experience was well received by students, with 100% of students recommending this training to their peers and repeated feedback desiring the expansion to include other technical skills.