Video-assisted reflection: improving OSCE feedback

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Abstract

Background: Objective Structured Clinical Examinations (OSCEs) are commonly used to provide feedback to students on their performance in formative examinations. However, students are often unable to act independently on the feedback they receive. This study explored how the use of video-assisted reflection in OSCEs can enhance students’ ability to reflect and engage in sustainable feedback.

Methods: Twenty-one students undertaking a mock-final OSCE consented to have one of their examination stations filmed. Participants completed a series of reflective forms immediately after the OSCE, after verbal feedback from an examiner and finally, after watching the video of their own performance. Students were asked to predict their overall grade as well as list areas for improvement. Pearson r correlations examined the relationship between the examiners’ grades and the candidates’ self-predicted grades. Wilcoxon signed-rank tests were used to compare the length of reflections at each stage. Semi-structured interviews were conducted to explore students’ beliefs on self-efficacy and how the video-assisted reflection altered their ability to act on feedback.

Results: The students’ ability to self-assess and gauge their own performance improved significantly after undertaking the video-assisted reflection ($p < 0.01$). Furthermore, video-assisted reflection significantly increased the length of the student’s reflections. In interviews, participants described multiple ways in which the video-assisted reflection improved their confidence and ability to act on feedback, highlighting a clear enhancement in self-efficacy.

Discussion: Video-assisted reflection of recorded OSCE stations represents an effective approach to increase student self-efficacy and subsequently improve engagement in sustainable feedback practice.

1 | INTRODUCTION

Objective Structured Clinical Examinations (OSCEs) are widely used to assess medical students’ skills in history taking and clinical examination. Formative OSCEs represent an excellent opportunity to provide feedback to students as they constitute authentic learning experiences but occur within a controlled environment. Clinical skill development occurs more quickly when students are provided with appropriate feedback.1

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Formative OSCEs represent an excellent opportunity to provide feedback to students as they constitute authentic learning experiences.

However, evidence suggests that students struggle to act upon the feedback they receive. Ideally, students should be able to make use of feedback independently in order to support their future learning—which is part of a practice known as ‘sustainable feedback.’ Numerous processes enable students to use feedback effectively. Self-assessment is a mechanism for one to identify one’s strengths and weaknesses. Following self-assessment, students need to make appropriate goals for their learning, a process entitled ‘self-regulation.’

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However, setting goals is no guarantee of achieving them. Self-efficacy—defined as the ‘confidence to carry out the courses of action necessary to accomplish desired goals’—is increasingly being recognised as a crucial determinant of success.

Video recordings of OSCE stations can help students engage with these feedback processes by providing students with a further opportunity to self-reflect on their performance. This video-assisted reflection (VAR) has been shown to help students improve their performance in subsequent OSCEs. However, little research exists as to how this process occurs. Our study aimed to establish how VAR can help students develop more sustainable feedback practices by exploring their ability to self-assess and self-regulate, and by exploring their self-efficacy beliefs.

## METHODS

We conducted a mixed methods evaluation to gauge the impact of VAR on student feedback processes. The impact of VAR on self-assessment and self-regulation was evaluated using quantitative measures, whereas self-efficacy was evaluated using qualitative approaches.

We invited 168 medical students from six different hospitals who were undertaking a mock-final OSCE to participate in the study. Students were reminded that there was no obligation to take part and that non-participation would not impact upon their involvement in the mock examination. Twenty-one students consented to participate in the study. Figure 1 outlines the number of participants involved in each stage of the study.

During their mock OSCE, participating students had one of their OSCE stations filmed. The mock OSCE consisted of a six station OSCE, with five stations lasting 11 minutes, and one extended station of 22 minutes. Examiners gave each participant an overall score of 1-5 for their performance, as well as written feedback on areas that went well and areas to improve.

The examiners’ score was recorded but not revealed to participating students until after the final reflection (Stage 3).

During their mock OSCE, participating students had one of their OSCE stations filmed.

After the OSCE station, participants completed a series of reflective forms; immediately after the OSCE (Stage 1), after verbal feedback from the station examiner (Stage 2) and 1 month later, after watching the video of their recorded station (Stage 3). The reflective forms required participants to predict their overall score for the station (on the same 5-point scale) and to identify areas for improvement.

The correlation between the examiners’ score and the students’ self-rated scores at each stage of reflection was completed with Pearson r coefficient and Fisher r-to-Z confidence intervals. Wilcoxon signed-rank test was used to undertake one way, paired testing which allowed for separate comparisons of the word count of student reflections at each stage.

All study participants were invited to take part in a semi-structured interview aimed at exploring the student’s perception of the VAR, and how watching the video helped them to prepare for their actual OSCE. Two students participated in the semi-structured interviews. The interviews were transcribed by the researchers and member checking was performed. Researchers were present as both interviewers and moderators during the interview. Content codes were arranged into categories and themes informed by self-efficacy theory.

## RESULTS

### 3.1 Self-assessment

There was no significant correlation between the participants’ initial self-scores (Stage 1) and examiner scores \( r(21) = .23 \text{ CI } -.23 \sim -.60 \) (Figure 2). However, there was a significant, strong, positive correlation between the students’ post-feedback scores (Stage 2) and examiner scores \( r(21) = .77 \text{ CI} .52 \sim .90 \), as well as between
There was no significant difference between the student and examiner score correlation at Stage 1 compared to Stage 2, as well as between Stage 2 and Stage 3. However, there was a significant difference between the student and examiner score correlation at Stage 3 compared to Stage 1.

3.2 | Self-regulation

The mean word count of student reflections immediately after the OSCE (Stage 1) was 4.05 words per reflection. This increased to 7.38 words per reflection after the examiner feedback (Stage 2) and to 21.1 words per reflection after the VAR (Stage 3). There was a statistically significant difference in word count between each stage of reflection \( (p < 0.01 \text{ for each difference}) \) (Figure 3).

Broadly, students reflected on similar topics across each stage of reflection; however, there was some evidence of increased content, and a trend towards more specific, measurable improvement points. Table 1 also demonstrates a clear linguistic shift with increased use of the first person after the VAR (Stage 3).

3.3 | Self-efficacy

Participants described how they found VAR-assisted feedback more objective, specific and honest, and that it helped them to identify more areas for improvement compared to traditional feedback. They described how VAR helped them set their own learning agendas,
enabled them to track their own progress and enhanced their ability to accept feedback.

Participants described how they found VAR-assisted feedback more objective, specific and honest.

One participant explained how they had used the VAR to benchmark their improvement after the OSCE and subsequently, how this had given them the confidence they needed to implement any learning goals. This link between a specific domain of action (OSCE performance) and increased confidence in their capability to accomplish a goal demonstrates improved self-efficacy as defined by Bandura.

4 | DISCUSSION

4.1 | Self-assessment

The strongest correlation between student self-score and examiner score came after the VAR. However, it is difficult to fully interpret the impact of VAR on a student’s ability to self-assess given the cumulative nature of the interventions.
Nevertheless, we found that students were significantly better at self-assessing their performance after watching the video of their OSCE station (Stage 3) compared to immediately after the OSCE station (Stage 1). This suggests that it is only after both examiner feedback and VAR that students become significantly better at self-assessing. This is concordant with previous studies which have found that students’ ability to self-rate their performance significantly improved after receiving video with performance benchmarks. This improvement is likely due to a combination of factors. Firstly, using VAR gives students a further opportunity to reflect on their performance away from the time-pressured environment of the OSCE, enabling deeper reflection to occur. Secondly, in the semi-structured interviews, students described how watching themselves in the third person gave them a more objective view of their performance which allowed for a more accurate self-assessment.

### 4.2 Self-regulation

The significant increase in the word count of the reflections after watching the videos (Stage 3) demonstrates that VAR allowed students to generate more specific, personalised learning goals. Goals with greater specificity have been shown to be more effective in improving outcomes compared to more general ones which may explain why VAR has been shown to improve performance in subsequent OSCEs. A potential limitation of this analysis might rest on the assumption that a longer reflection is more specific. However, in interviews, the students described how they felt watching the videos allowed them to generate more specific and numerous learning points compared to the ‘generic’ feedback they received from examiners. In addition, the post-VAR mean word count was significantly higher than the post-feedback word count.

### Table 1: Transcripts of each student’s reflections at the three stages of the study

| Student | Stage 1: Immediate reflection transcript | Stage 2: Post-feedback reflection transcript | Stage 3: Post-VAR transcript |
|---------|------------------------------------------|---------------------------------------------|------------------------------|
| 1       | Revise CN pathology                      | Need to review thyroid exam and CN pathologies | Better understanding and structure of thyroid exam and CN pathology signs |
| 2       | More structure. Thyroid exam             | More describing of what I can see            | Need a better understanding of key rheum signs. Learn to do a thyroid exam and in shorts to just describe what I can see |
| 3       | Better knowledge                         | Slow down and take a breather before answering any questions | If I’m not sure if I should do something, I should ask the examiner. Take a breath before answering my shorts questions |
| 4       | more confidence                          | Need more structure in answers. Go quicker through answers | Be more confident in answering shorts questions that I know the answer to but don’t rush |
| 5       | Try to be more confident                 | Faster. Show off knowledge.                  | Don’t cut my answers short and show off what I know and I need to list the x-ray changes in arthritis |
| 6       | Slow down and relax. Dealing with diagnostic uncertainty | Be more confident when presenting examination findings | I will try and be more confident with my clinical findings to sound more confident in my exam. I need to stick to a structure when unsure of the answers in the station. |
| 7       | Think simple before jumping to complex diagnosis | Make sure I give common causes first. Do not get confused between hyper and hypothyroid | I need to review the differences between over and undertactive thyroid and ensure that I cover the basic differentials before the rarer ones |
| 8       | More structure                           | Better structure to my answers such as extraarticular feature of RA | In the shorts questions I need to have a clearer structure in answers |
| 9       | Just more reading up about conditions    | Better structure to answers                  | I need to revise the causes of x-ray changes. In the real exam I need to be more scientific when describing rheumatoid hands |
| 10      | Breathe a bit                            | Take a second to breathe before answering questions | Take time to go back to basics of the exam |
| 11      | Wash hands. Speak to patient before      | Be sure to stick to WIPPE at the start of the exam | Wash hands. Prepare an introduction. Be systematic in my approach. Confidence - answer the questions without breaks and pauses. Let it flow off the tongue. |
| 12      | Revise rheumatoid x-rays                 | Examine form the back and need to remember to wash hands | I need to take consent after my intro at the start of examine. Next time I also need to remember to wash my hands |

| Mean word count | 4.05 | 7.38 | 21.17 |
count, suggesting that VAR may be independently enhancing self-regulation and reflection.

The VARs contain a clear linguistic shift towards use of the first person. This shift may suggest students are taking ownership of their learning goals, thus providing evidence of greater self-regulatory capacity since self-regulation is ‘an active, constructive process’.11

4.3 | Self-efficacy

In the interviews, students described the impact of VAR on student self-efficacy (Table 2). Research has demonstrated that self-observation of good performance can enhance student self-efficacy, but observation of relative ‘failure’ can diminish it.6 If the students who took part in this study were generally higher scoring candidates, this may explain why the VAR appeared to improve self-efficacy in these students.

Feedback from examiners provides students with an external perspective on their performance. We hypothesise that VAR allows students the opportunity and confidence to integrate these external perspectives with their own view of their performance. This idea was reinforced in the semi-structured interviews where students described being more confident and more likely to achieve any learning goals set out by examiners if they were also able to observe it

TABLE 2 Summary of the thematic analysis of the participants’ semi-structured interviews

| Feedback Components | Specific Areas | Summary | Quotes |
|---------------------|----------------|---------|--------|
| Self-Assessment     | Third-person perspective | Students believed that watching the videos gave them a third-person perspective which allowed them to more objectively assess their performance | “I think when you’re looking at the video, you’re more like third person observing what happens and I think when you take yourself out of [the] first person you become a bit more objective and can critique yourself better” Student 1 “I remember when I was watching the video, I was thinking in the first person ‘oh this was bad’ but then in the third person I seemed to hold it quite well” Student 2 |
| Self-Regulation     | Number of improvement points | Students felt that watching the videos allowed them to identify more areas of improvement compared to traditional examiner feedback | “If you have a video you can back through and catch all the details of how you can improve yourself rather than have like the one or two sentences of feedback like normal” Student 1 “There are lots of subtle points like the tone of your voice that the examiner wouldn’t point out, but you notice yourself” Student 2 |
|                      | Honesty of feedback | Students felt that watching the videos allowed them to give more honest feedback to themselves compared to their peers | “When you actually look at it yourself, I think you are more honest about your performance because when I’m practicing with friends, they give me feedback, but I think they tend to be quite nice about it” Student 1 |
|                      | Specificity of feedback | Student believed that the improvement points they identified in the video were more specific than those provided by an examiner | “I think that examiner feedback on paper can be a bunch of very generic points on how to improve and they don’t really remember you which doesn’t compare to a video of you actually doing it which is great” Student 1 |
| Self-Efficacy        | Focus of future examination practice | Students felt that watching the videos and identifying their own improvement points allowed them to better direct their future examination practice towards the areas of improvement | “Now I had my own things to improve, when I do a mock session with my friend, I can be confident and say ‘focus more on those aspects rather than something else’” Student 1 |
|                      | Comparison to previous practice | Students described how comparing their practice ‘now’ to when they were recorded improved their confidence | “I think if we had done the actual OSCE then I would have been more confident going in that I could have improved the changes. Student 2 |
|                      | Acceptance of negative feedback | Students felt that watching the videos made it more likely they would change any negative aspects of their practice | “I could always go back to the video and see how far you’ve come alone and it’s a good boost to your confidence to see the progress you’ve made”. Student 1 |
|                      |                           |                     | “If you have the physical evidence of you having to improve, you’re more likely to accept it where as if you disagree with the examiners feedback you’re not going to change anything” Student 1 |
|                      |                           |                     | “When you pick up on faults yourself I think you tend to be more receptive to them compared to when someone points them out”. Student 2 |
Integration of external and internal feedback allows students to take ownership of the learning goals they create—as indicated by the increased use of the first person when writing these goals.

Feedback from examiners provides students with an external perspective on their performance.

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Integration of external and internal feedback allows students to take ownership of the learning goals they create.

4.4 Limitations

There were several limitations of this case study: it involved a relatively small sample size and those that agreed to be interviewed may not be representative. Between Stages 2 and 3 of the reflective process, the study had an attrition rate of 43% (n = 21 at Stage 2 and n = 12 at Stage 3). Many final-year students entered clinical training early due to the COVID-19 pandemic, which impacted upon their ability to take part in the semi-structured interviews. Both of the students who participated scored 4/5 on the station, meaning their insights may differ from participants who achieved lower scores. Due to suspension of clinical examinations in the United Kingdom during the COVID-19 pandemic, we were unable to assess whether VAR led to better performance in subsequent, summative OSCEs. Nonetheless, a low-cost intervention that builds self-efficacy in even a small subset of students has value.

Previous papers have highlighted that videotaping OSCE stations can also involve unanticipated costs to the institution. However, many institutions already have data storage platforms with protected access that can be used for this purpose, which we feel adjusts the cost–benefit ratio favourably. VAR involving patients will need to follow GMC guidelines on filming for secondary purposes, as well as data protection legislation. There may also be additional difficulties finding volunteer patients or actors who consent to OSCE stations being filmed. If a patient or actor is unwilling to be filmed, or if consent and data protection are prohibitively burdensome, there may still be considerable educational benefit in filming the student alone—such as in communication stations or the students’ interaction with the examiner. We hope to examine the utility of VAR in other teaching settings such as communication skills teaching, during which we intend to utilise evidence-based feedback forms to standardise the feedback process.

5 CONCLUSION

In conclusion, we have demonstrated that VAR can help increase the sustainability, accuracy and actionability of the feedback process by improving student self-efficacy. This process is feasible to implement, requiring minimal equipment, and could be used in both formal educational settings such as clinical skills sessions and formative assessments.

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CONFLICT OF INTEREST
None.

ETHICAL APPROVAL
This study was given ethical approval by the Medical Education Ethics Committee (MEEC) at Imperial College London on the 19 December 2019 (ref MEEC1920-178).

When advertising the study, we emphasised that participation was entirely voluntary, and that non-participation would not
harm them. Students interested in participating were asked to e-mail the investigators who then sent further written information. All participating students completed written consent forms and consented for any data gathered during the study, including from semi-structured interviews, to be anonymised and used for publication.

All participants were free to opt out of the study, or of their data being used, at any point. The study was conducted and data collected from January to April 2020.

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