

Video Recording and Feedback in Clinical Education: Effectiveness, Best Practices, and Operational Concerns

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Abstract: The nature of clinical education, with its mixture of domain knowledge and practice, makes it a difficult environment in which to assess learning. Direct observation by an expert is a typical way to facilitate such assessment; however, in person observation can be disruptive and logistically problematic. Video recording combined with modern computing technology has helped to address these issues by providing environments in which experts can perform remote observation and provide both synchronous and asynchronous feedback to clinical learners. This article examines literature to determine the efficacy of such systems, and identifies best practices in their use.

Introduction

Determining what learners know is a problem as old as education itself – this, in a nutshell, is the problem of educational assessment. Traditionally, assessment has been largely conducted using instructor developed or standardized examinations based upon principles of item response theory. In both cases, students are prompted to provide answers to questions designed to test their understanding of knowledge domains of interest. The problem is that some skills are difficult to test using such tests of knowledge. Domain knowledge may be necessary for a given area, but sometimes this knowledge is not enough to ensure learners can utilize skills in practical settings.

The clinical environment is one such setting in which domain knowledge itself is insufficient to assess a learner's ability. Skills and competencies utilized in clinical environments go far beyond the recall of domain knowledge, and can rely on the demonstrated synthesis of multiple knowledge domains. For example, the medical student may need to combine medical science and anatomy domain knowledge with fine motor skills to master surgical techniques. The counseling student may need to combine domain knowledge of psychology and counseling techniques to address the particular needs of a client. The nature of these tasks lends themselves to being best assessed through direct, expert observation.

The Problem of Observation and Historical Context for Video Observation

Observation has traditionally been difficult, because technical limitations in the past made it necessary for observation to be performed in person. At the least, this created logistical challenges with respect to scheduling, as the observer and the observed would need to synchronize their schedules. This presence, in turn, could create additional issues. Fraenkel, Wallen, and Hyun (2015) point out the fact that the “presence of an observer can have a considerable impact on the behavior of those being observed” (p. 446). Thus, for validity's sake, in-person observation required elaborate building design with subject and observer rooms. Such setups, due to their design, utilized a considerable amount of building space and were thus expensive to construct. As a result, buildings might have only a few of these spaces available, which brings us back to the problem of logistics – this time, related to the

sharing of a limited resource. Though helpful at addressing validity issues, this approach to observation failed to solve the logistical challenges related to in-person observation.

The advent of video tape recording led to change in this area. Barbee and Keil (1973), leaning on the suggestions of Wilmer (1967), provide an early example of the use of video tape recording in observation, using recordings to provide a group of judges with the ability to observe and assess the skills of interviewees without physically being in the same room with them. As video recording technology advanced and became less expensive through the late 1970's and 1980's, this approach to observation became more common.

As technology progressed, the digital video recorder was introduced and, the use of video for observation has become even more sophisticated. Collins, Cook-Cotone, Robinson, and Sullivan (2004), provide an example where digital video, of what Collins, et al. refer to as “authentic situations” (p. 131) is uploaded to a learning management system where fellow students can provide notes of self-reflection and engage in peer review. Mahling, et al. (2015) additionally suggest that, depending on the requirements of the system, video observation need not always be an expensive investment.

Effectiveness of Video Observation and Feedback

The history of video observation, at the very least informally, suggests that there is some merit in using video at some point in the observation and feedback process. As we noted in our brief consideration of historical studies in video recording, both Barbee and Keil (1973) and Collins et al. (2004) used video for the purposes of both observing and providing subsequent feedback. There is considerable evidence from the past few years that generally suggest video as an effective modality for observation and feedback.

Managheb, Zamani, Shams, and Farajzadegan (2012) provide some statistical evidence that video feedback may be beneficial. In a study of 40 medical students, Managheb et al. divided the students into two groups of 20 to create an experimental and control group. All 40 students participated in the same communication skills classes and were given a formative evaluation. The experimental group then participated in video feedback-based training whereas the control group continued with classroom-based didactic training. At the end of training summative assessment was conducted. The results of the study found no statistically significant difference between the formative and summative assessments in the control group; however, discovered significant differences in the experimental group, suggesting video feedback was effective.

It is worth noting that not everyone shares this view. Bolger (2008) also addresses the topic of communication skills development, similar to Managheb et al. (2012). Unlike Managheb et al., however, Bolger concludes that results “do not suggest the relationship between the use of video feedback and the development of communication skills is significant” (p. 117). Conflicting results between studies are not indicative of an overall pattern. Of course, the result of any particular study is a function of the research design, sample, and other properties of the study itself, and so no study can be said, apart from clear criticisms in methodology, to be more authoritative than any other. Thus, we need to examine the trends regarding video feedback in a larger number of studies.

Fukkink, Trienekens, and Kramer (2011) provide such analysis and in so doing provide considerable evidence of the effectiveness of video observation in feedback in a meta-analysis of 33 experimental studies. While Fukkink, et al. (2011) found that effectiveness varied according to the strategies employed, their study provides significant evidence in favor of the effectiveness of video-based observation and feedback. Overall, the effect size of video feedback was 0.40, placing it in the upper-end of the small effect range per Cohen's (1988) guidelines and in the lower-end of the zone of desired effects according to Hattie (2007). Thus, it can be concluded that there is a statistical basis for the belief that video feedback has positive utility.

Ethical and Operational Concerns of Video Feedback and Technology

Before proceeding much further with this discussion, ultimately focused on identifying best instructional practices with respect to video-feedback, there is reason to stop to consider some of the ethical and operational concerns that surround the use of video technology in clinical settings. Much of the concern regarding the use of such technology stems from the fact that recordings made in clinical environments often involve real clients or patients. For example, the American Psychological Association's (APA; 2014) *Guidelines on Supervision* make it

clear that supervision is expected to occur in the context of “clinical services provided by individuals in health service psychology education and training programs” (p. 9).

Observing individuals in such an environment necessarily raises ethical concerns. Most generally, the United States Government (1979) has established expectations for the treatment of human subjects in research in *The Belmont Report*. The notion of informed consent is an important one in all modern scholarly activity that requires the collection of personalized information. Though video observation of students may not be considered an experimental research activity, the spirit of *The Belmont Report* arguably suggests that informed consent is no less applicable to the video recording of individuals in delicate, personal situations. This would seem to comport with APA (2014; 2017) guidelines in both their *Guidelines on Supervision* and *Ethical Principles*, as well as with the American Medical Association’s (2016) *Code of Medical Ethics*.

These same ethical codes also place significant emphasis on protecting patient confidentiality. This is not terribly surprising given the present legal environment which demands protection for patient and client information. The Health Insurance Portability and Accountability Act (HIPAA) includes a rule protecting privacy (U.S. Government, 2015) as well as additional rules that set standards for information security practices as well as require notification to individuals affected by a security breach of protected health information (PHI).

Thus, use of electronic or digital recording for feedback should take into consideration whether or not the context of the recording involves protected health information or could otherwise be considered an electronic health record. If the recording constitutes such a record, then the workflow managing such recordings may need to meet stringent security policies. For example, with mock counseling sessions it may be sufficient to upload video to a learning management system that utilizes shared storage; however, with actual clinical sessions, it may be necessary to record video in a self-contained system. Further discussion of security is outside the scope of this paper, so it is recommended that those wishing to use video to record confidential sessions consult with appropriate information technology professionals for more information on organizational policy and guidance on how to build a secure video recording platform.

Finally, it is worth mentioning that video recording need not *only* serve a purpose for observation and assessment in clinical settings. Thiel-Bonney (2016) reminds us that, as much as video may be useful for observation, video has equal merit as a tool to aid in the diagnostic process. Thus, clinicians should be trained not only to think of video as a means for assessing and providing feedback on their performance, but they should also (and perhaps even more so) be trained to think of video recording as a tool to assist them in patient or client diagnosis. Those working with actual clients or patients have an ethical obligation to use every resource available to them, including video recordings, to assist in reaching a proper diagnosis.

Best Practices in Video-Based Feedback

With other concerns addressed, we turn our attention then to the main focus of this paper: best practices in using video recording for observation in feedback. It is worth taking a moment here to discuss how these practices were identified and how they are presented here.

The identified best practices were extrapolated from a review of literature. The literature identified emerged through multiple searches for articles related to “video feedback,” “clinical video assessment”, and other variations on those themes. Articles were subjected to a cursory review to determine if they were suitable for inclusion. Articles deemed suitable were then subjected to additional scrutiny and coded based on themes related to the practice of video feedback. Those themes that stretch across the literature are those that are given most credence here as major themes. Minor themes are those that, by contrast, only manifest themselves in a smaller portion of the literature; however, seem to have promise for additional examination.

Major Themes in Video-Based Feedback Best Practices

Collaborative Culture

Culture, for our purposes here, can be defined as the beliefs, attitudes, and practices that shape the way members of an organization behave. Educational assessment, generally takes place in the context of such culture, and can be influenced by it. Collaborative culture, means to create an environment or a culture in which faculty and

students collaborate. The APA's (2014) guidelines on supervision speak directly to the need for collaborative culture saying that supervisors should: "value and seek to maintain a collaborative relationship that promotes the supervisees' competence..., seek to specify the responsibility and expectations of both parties in the supervisory relationship..., and regularly review progress of the supervisee" (p. 17). The APA's expectations of a supervisor paint a picture of someone who works to ensure that the learning environment for supervisees is a safe one in which the supervisor is working towards the supervisees' best interests.

This is a theme that is captured elsewhere in literature. Lindon-Morris and Laidlaw (2014), in examining learner anxiety in the face of video recording, suggest that clinical trainers should be aware of the potential for anxiety, seemingly suggesting that they work with or collaborate with learners to manage anxiety that might negatively impact learning experiences. VanDerWege (2011) also calls attention to such a potential for supervisee anxiety, which further work with supervisors helped to alleviate. Kennedy and Lees (2015) further suggest the benefit of a collaborative culture, or at least collaborative relationship, in the design of their experiment by building in instructor feedback and support.

Systematic Assessment

Systematic assessment, is simply a fancy way of saying that assessments are conducted in a uniform manner. Lack of uniformity in assessment is a significant problem that can undermine not only comparisons made between students but that undermine comparisons between the same student at various stages of progress as well. Kogan et al. (2012) suggest such lack of uniformity, pointing to a problem of faculty frame-of-reference. They note that "faculty [and] staff often lack frameworks and objective milestones when they engage in feedback" (p. 211). They go on to suggest that faculty feedback would be improved if it were "framed in the context of agreed milestones... relocating it from a context of feedback about a person to one of feedback about a task and process" (p. 211–212). Form-based assessments seem to be a common method for structuring such feedback (Kennedy & Lees, 2015; Kogan et al., 2012; Managheb et al., 2012).

Fukkink et al. (2011), provides some of the strongest empirical evidence of the utility of systematic assessment. In their meta-analysis of video feedback discussed earlier, Fukkink et al. (2011) found that studies utilizing observation forms to standardize assessments had an effect size of 0.55. This is a substantial effect by both Cohen's (1988) and Hattie's (2007) guidance, and suggests that standardized observation is a major factor in the effectiveness of video feedback.

Positive Reinforcement and Constructive Feedback

It seems a bit of a truism in instruction to suggest that learning outcomes are linked to the frequency and appropriateness of feedback from instructors to learners. Merrill (2002) extols the virtue of feedback, writing that "feedback has long been recognized as the most important form of learner guidance" (p. 50), and noting that "Gagné included feedback as one of the events for instruction" (p. 50; Gagné, 1985). In so far as many of the "giants" of instructional design and learning sciences may remind us of the importance of feedback, they do less to address whether or not all forms of feedback are equally efficacious.

It is the efficacy of different types of feedback that catches our attention in this review of literature. In general, two themes regarding feedback develop as the literature suggests that feedback should both utilize positive reinforcement (Fukkink et al., 2011; Lindon-Morris & Laidlaw, 2014; Swank & McCarthy, 2015; Tracey, 2006) and be constructive in nature (Swank & McCarthy, 2015; Tracey, 2006). Positive feedback, relates to the idea that students are given positive affirmations in response to things that are done well, while constructive feedback relates to that feedback which is intended to correct a perceived problem or issue.

Positive feedback is helpful, because it helps boost the self-efficacy of learners and reduces anxiety. Lindon-Morris & Laidlaw (2014) point out, "[s]tudents were initially very self-critical about their own performance, but their morale was boosted after receiving positive feedback from their peers" (p. 177). However, constructive feedback that addresses and provides suggestions for addressing shortcomings in performance is also important. VanDerWege (2011) recounts instances of students opining that they received too much positive feedback with too little constructive feedback, thus suggesting that students expect some degree of constructive criticism. Empirically, Fukkink (2011) found that the effect size related to positively-oriented outcome measures (ES = 0.41). While this is

considerably higher than that related to negative outcome measures ($ES = 0.28$), the effect size of negatively-oriented outcome measures is not insignificant in the guidance of Cohen (1988) and Hattie (2007).

Together, these studies seem to support Tracy's (2006) contention that while positive feedback is more effective, there is certainly a place for telling students what they are doing wrong. Indeed, according to Swank & McCarthy (2015), 93% of students in their study indicated that "having a balance of positive and corrective feedback is most helpful" (p. 10). Thus, Swank & McCarthy provide empirical evidence that students expect feedback that goes above simply telling them what they are doing right, and expects that feedback will provide advice on how to correct perceived deficiencies in competency.

Modeling, Benchmarking, and Best Practices

Modeling, rooted in Bandura's (1971) social learning theory, is the idea that learners observe and emulate desirable behaviors. Modeling, is a fairly common theme in the literature. Kennedy & Lees (2015) discuss both peer modeling (observing desirable practices in the work of other learners) and instructor modeling (desirable practices demonstrated by instructors) in the context of feedback provided to learners. Benchmarking, on the other hand, is providing learners with examples of desirable behaviors against which other behaviors can be judged. Hawkins, Osborne, Schofield, Porunaras, and Chester (2012) discuss the importance of benchmarks, particularly in the context of student self-assessment. In their study, it is determined that providing video-based benchmarks for assessment bring self-assessment scores more in-line with expert assessment scores. Raaijmakers, et al. (2017), replicating the work of Kostons, van Gog, and Paas (2012), provided additional support for this approach, finding an improvement in skills transfer as a result of video-based modeling and benchmarking.

So, Pow, and Hung (2009) suggest that technology can be used to combine both of these ideas. They examined the idea of creating a database base, or knowledge base, consisting of video of teaching practices. While their research findings are arguably more relevant in a discussion of peer review, their approach is interesting in that it allows videos to serve two purposes. On one hand, videos that are deemed by the class and instructor to be exemplary of a best practice can be used for modeling that practice to current or future students. On the other hand, those same videos can, for the purposes of self-reflection or peer review, serve as clear benchmarks for engaging in self- and peer-assessment.

Self-Reflection and Peer Review

Self-reflection and peer review, are perhaps two of the most important practices identified, as elements of the two practices seemed to permeate almost every article reviewed for this study. That self-reflection and peer review would be so important, makes some sense when we stop to consider that these processes – reflecting on the work of others and on our own work– essentially serve to develop the critical, metacognitive processes that underlie learning. Lewis, Moore, and Nang (2015) make it clear that these types of processes are critical for the development of the skills necessary to engage in life-long learning.

Pinter, East, and Thrush (2015), found self-reflection to be helpful in developing behavioral change. In this experiment, they provided several classroom teachers with training on the use of praise in classroom management. Over the course of the study, teachers would review recordings of their class sessions and use a data sheet to record their use of positive and negative comments. They concluded that this self-reflective process met with some success, as the mean number of uses of praise were found to increase. Moreover, qualitatively, participants in the study remarked at the specific awareness the experience brought to their classroom behavior.

Peer review, appears to be equally beneficial. In a review of literature, Morris (2001) ultimately accepts the notion that peer review has "a positive impact upon the quality of the learning process, and can help develop self-direction and autonomy" (p. 513). Peer review may, however, need to be balanced. Lindon-Morris & Laidlaw (2014) suggest that peer review may, at least initially, increase the anxiety of students who fear that they may be judged inferior by peers. This is an area where establishing a collaborative, supportive environment as mentioned before can help lessen this issue. Further, Lindon-Morris & Laidlaw suggest that the anxiety levels of students tend to subside after having been through the process.

Minor Themes in Video-Based Feedback Best Practices

In addition to some clear best practices revealed in the literature, there are a few other ideas that emerged from the literature review, but require further examination and evidence to be considered among empirically-observed best practices. These could be taken as suggestions (as it is unlikely any would have a negative effect); however, there is still room for more information with respect to these practices.

Grounded in Design Practices

It may seem a truism, but both media and instruction must be grounded in good instructional design practice. Yavner et al. (2015) provide several insights on improving the effectiveness of multimedia. Though these are general concerns with web-based multimedia instruction, they are rightly applied in the context of video feedback systems. Moreover, many of the insights provided, relate directly to instructional design principles – connecting with prior knowledge, managing cognitive load, chunking, provide feedback, etc. Thus, we can conclude that the use of video feedback systems should be grounded in good instructional design practices.

With this in mind, it makes further sense that the use of video feedback systems should be grounded in good general design practices. Even if such a system is surrounded by otherwise good instructional design practice, a poorly designed system, with poor user interfaces and confusing workflows, for example, can wipe out the advantages it might otherwise bring to the instructional process. Thus, when considering the use of such feedback systems, it is wise to consider design issues such as usability, accessibility, and user experience.

Expectations Expressed Up-front

In some respects, this seems to be a synthesis of the call for both a collaborative environment and the use of good instructional design principles mentioned previously. After all, a collaborative environment is built, in no small part, on mutual respect, and it is generally respectful of others to be upfront regarding expectations. This is also true in instructional design, which suggests that learning goals and objectives should be expressed up-front. VanDerWege (2011), in examining the experiences of counseling students undergoing supervision, notes themes of students struggling with confusion, suggesting that expectations were not addressed up-front and thus had some negative impact upon learning.

Assessment Training

If we accept the premise that conducting observation and assessment is a type of research, even if it is not experimental, then we should at least accept the proposition that observation should follow some of the same rules as typical research. Fraenkel et al. (2015) note several threats to research validity regarding the manner in which data are collected, particularly data collector and observer biases. In typical research settings, these threats might be controlled by using multiple observers. By way of example, Kogan et al. (2012) utilized training in a study related to the video-based assessment of medical residents by attending physicians in order to control for such biases in the research interview team. It seems reasonable to believe that, if training can be an appropriate tool for promoting more uniform assessment of research subjects by researchers, then it should also be an appropriate tool for ensuring uniform assessment of learners by researchers. Thus, we suggest that it might be helpful, especially if utilizing some type of standardized feedback instrument, if faculty receive training on the instrument to be used. Moreover, it is possible that students could benefit from multiple faculty perspectives (though the literature consulted thus far does not address this contention).

Theoretically Grounded

Perhaps the most interesting thing in Tracey's (2006) discussion of supervision, is the idea that it should be grounded in theory. While this may seem like a patently obvious observation, it is also true that theory (as well as other considerations), by virtue of human decision-making, sometimes gives way in practice to that which is convenient, necessary, or political (Hoy & Tarter; 2008). Moreover, inasmuch as it seems Tracey intended this theoretical grounding to apply largely to the theories or lenses of counseling, we would be remiss if two things were not considered. First, we must consider that supervision is not unique to the realm of counseling psychology, and so we can generalize that Tracey's suggestion of theoretical grounding would apply in other contexts where supervision

would be appropriate – medicine, speech pathology, etc. Second, we must also keep in mind that instructional elements of supervision should be grounded in instructional theory, providing additional support for the earlier notion that video supervision and feedback should have a firm foundation in instructional design.

Limitations

This particular review of literature, though it attempted to be inclusive of all relevant disciplines such as counseling education, medical education, learning sciences, etc., only managed to address a small sliver of potentially applicable bodies of research. While the practices identified here are certainly likely to be beneficial, it may be premature to identify some of them as “best practice” and additional research may be required to declare them such.

Conclusion

In this paper, we have endeavored to survey literature in search of best practices as they relate to the use of video feedback in clinical situations. We have considered the history of video feedback as well as the question of whether or not it is effective, and though studies are not unanimously in favor of video feedback, there does appear to be a significant body of literature that suggests value in the practice. We have examined several ethical and operational concerns of video feedback, with particular emphasis on the need to protect the confidentiality of individuals and to ensure appropriate security practices. Moreover, we have examined the literature and found two levels of practices related to video feedback. Major themes, those themes that appear prominently in the literature reviewed, include the creation of collaborative culture; systematic assessment; use of positive reinforcement and constructive feedback; modeling, benchmarking, and best practices; and self-reflection and peer review. Minor themes, those themes that are less prominent or for which less evidence was uncovered, are the grounding in good design practices; need to express expectations up-front; need to provide training on the use of assessments; and theoretical grounding.

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