The influence of clinical practice video on learning conversations in postgraduate medical education: A scoping review

A. Y. Huang[1, 2, 3], A. Ryan[1], M. Bearman[4] & E. Molloy[1]

Abstract

Introduction: Studies of learning conversations in medical education suggest these interactions can be supervisor driven, monologic and may involve poor recall of events. Educators often use camouflaged comments to avoid upsetting learners, which can interfere with meaning making. Using video of clinical practice within learning conversations could address some of these potential limitations. Despite educators using video of clinical practice in learning conversations for decades, we could find no synthesis of empirical studies to provide insight into the influence of video in learning conversations. Therefore, we conducted a scoping review to answer the question "How does video of clinical practice influence learning conversations in post-graduate medical education?"

Methods: We employed a scoping review methodology. MEDLINE, Embase, PsycINFO and ERIC databases were searched for articles from 1 January 2010 to 1 January 2022. Major inclusion criteria were postgraduate medical learners and video of clinical practice that was used in a learning conversation. The qualitative data relating to video's influence on learning conversations were synthesised and thematically analysed.

Results: Five articles were included in the synthesis. We generated four themes from the qualitative data about the influence of video on the learning conversation. Video: (1) captures performance data that can be co-analysed, (2) enables the learning conversation to take place in a different environment, (3) changes the teaching approaches of educators and (4) may promote learner agency and voice.

Conclusion: Video may influence learning conversations, and video's influence is likely entangled with the educational design associated with its use. No study directly addressed the phenomenon of how video influences learning conversations, and further study is required in this area.

Keywords: coaching; feedback; learning conversation; medical education; postgraduate medical education; video; video-assisted coaching; video feedback; video review

[1] Department of Medical Education, Melbourne Medical School, University of Melbourne, Melbourne, VIC, Australia
[2] Department of Critical Care, Melbourne Medical School, University of Melbourne, Melbourne, VIC, Australia
[3] Department of Anaesthesia, Austin Health, Heidelberg, VIC, Australia
[4] Centre for Research in Assessment and Digital Learning, Deakin University, Geelong, VIC, Australia

Correspondence: Andrew Yanqi Huang andrew.huang@unimelb.edu.au

Introduction

Learning conversations are interactions used by educators to stimulate learner reflection on their clinical experiences, strengthen their conceptualisations of practice and impact future learner performance (Tavares et al., 2020). They are considered essential for learners to calibrate the gap between their current and expected performance (Ramani et al., 2019). Traditionally, these learning conversations have been characterised by, and preceded by, direct observation of a learner by an educator. Learning conversations have been defined as "dialogue informed by an educator's observations of a learner's behaviour in actual or simulated clinical practice, conducted with the intention of improving future performance" (Tavares et al., 2020, p. 1020). "Learning conversations" include what is commonly called "feedback", and for the purposes of this article, we refer to feedback as learning conversations.

Learning conversations are complex exchanges influenced by many factors, including the stress of the clinical environment, time pressures, emotions, interpersonal tensions and the learning environment (Ramani et al., 2019). Learner responses to learning conversations can be variable, and learners reject the critique discussed during the conversation when they feel it is not credible. This credibility is influenced by factors such as educator–learner relationships, the manner of delivery, perceived intention of the educator, alignment with self-assessment and perceived threat to self-esteem (Ramani et al., 2019). Observational studies of learning conversations in health professional education suggest they are often supervisor driven and monologic, with scant input from the learner (Johnson et al., 2019). In simulation, learners report learning conversations may sometimes be unproductive because recall of events may be vague or contested (Zhang, Goh, et al., 2019). Sometimes educators may even provide comments that are intentionally vague, ambiguous or camouflaged because they fear that raising performance concerns may have negative consequences on their working relationship with the learner (Johnson et al., 2020; Scarff et al., 2019a; Watling & Lingard, 2012). On occasion, these conversations might be delivered as monologic assessment messages (Scarff et al., 2019b), or perceived as such (Brand et al., 2020), depriving learners of their voice.

Video review of recorded clinical practice during the learning conversation may address some of these barriers to effective learning conversations. Educators have been reporting the use of video in addition to (or instead of) direct observation to inform their learning conversations in postgraduate medical education as early as the 1960s (Goldman et al., 1969). Currently, video-assisted learning conversations are most common in simulation. When video was introduced into the learning conversation in one simulation study, video facilitated verification of comments and cancellation of bias and error, made learners more open to criticism and helped learners relate current encounters to future practice (Zhang, Goh, et al., 2019). This study highlighted the emotional roller-coaster of fear and anxiety experienced by learners sitting in tension with their desire for constructive learning when video is utilised in the learning conversation. Learners pointed to poor-quality video,

the time taken to review video and perceived embarrassment and threats to social self-esteem as negatives to using video in learning conversations (Zhang, Goh, et al., 2019). More widely in the simulation context, one integrative and four systematic literature reviews (Ali & Miller, 2018; Cheng et al., 2014; Garden et al., 2015; Levett-Jones & Lapkin, 2014; Zhang, Mörelius, et al., 2019) investigated the value of video in learning conversations. The outcomes of these reviews on video-assisted-learning-conversation interventions in the simulation context were mixed. Given the equivocal conclusions drawn from these reviews in the simulation literature, we were eager to see if similar studies had been performed in the authentic setting of clinical practice.

In clinical practice, the competing priorities of direct observation, patient safety and efficient time use add to the already complex landscape of work-integrated learning. In the postgraduate medical education environment, educators and learners engage in highly complex tasks. The impaired recall associated with this complexity might influence subsequent learning conversations, and in these circumstances, video may have more to offer the educator, the learner and their learning conversation. Video may influence learning conversations as a data source that poses problems for learners and educators to solve together through better communication, while video can also be used to disrupt "the vertical patterns characteristic of banking education" (Freire, 2000, pp. 79–80). (Note that "banking education" refers to a teaching method that treats learners as empty vessels. Educators using the banking education model "deposit" information into passive learners' minds rather than encouraging critical thinking and active learning.) Freire also emphasises that educators must intentionally partner with learners on a relational level (Freire, 2000). Therefore, educational design and implementation—how and by whom video is used—are possibly as important as the video itself. Phenomena such as learner–educator relationships, manner of delivery and perceived intentions of the educator contribute to the credibility of the learning conversation (Ramani et al., 2019) and are all interwoven with the educational design.

A review of how video (and its associated implementation strategies) influences the learning conversation is, therefore, important to help postgraduate medical educators understand how to maximise the benefit of video for learners and avoid its pitfalls. A search of existing review repositories (NIHR, n.d.) and databases did not identify any pertinent literature reviews relating to the influence of video on the learning conversation in postgraduate medical education. Therefore, our research question is: How does video of clinical practice influence learning conversations in postgraduate medical education?

Methods

Scoping review methodology provides a "panoramic and intellectual overview of what is currently known" (Davis et al., 2009, p. 1396) and maps the knowledge gaps (Munn et al., 2018). We chose Arksey and O'Malley's (2005) 5-step scoping review methodology because its iterative nature aligns with our constructivist research paradigm.

Step 1: Identifying the research question

We began by developing our research question in an iterative, non-linear process with movement back and forth between each stage (Arksey & O'Malley, 2005). As our familiarity with the literature increased, the research question was finalised.

Step 2: Identifying relevant studies

Based on this question, we used the population, concept and context model to develop our search terms (Peters et al., 2020). We chose "postgraduate medical learners" (see "Postgraduate Medical Education" in Table 1) as the population of interest to narrow the research scope. The concept was "influence of clinical practice videos", and the context was learning conversations. We adopted Tavares et al.'s (2020) definition of a learning conversation (see Table 1) and defined "clinical practice" by doctors' duties according to the CanMEDS Physician Competency Framework (Frank et al., 2015) (see Table 1).

We conducted a preliminary search of MEDLINE, and the citations found were reviewed for further search optimisation (Arksey & O'Malley, 2005). The search terms and methodology were reviewed by two specialist research librarians. The search was performed using MEDLINE, Embase, PsycINFO and ERIC, initially on 1 March 2021 and later updated to 1 January 2022. The final search terms are available in Appendix 1.

Table 1

Definitions

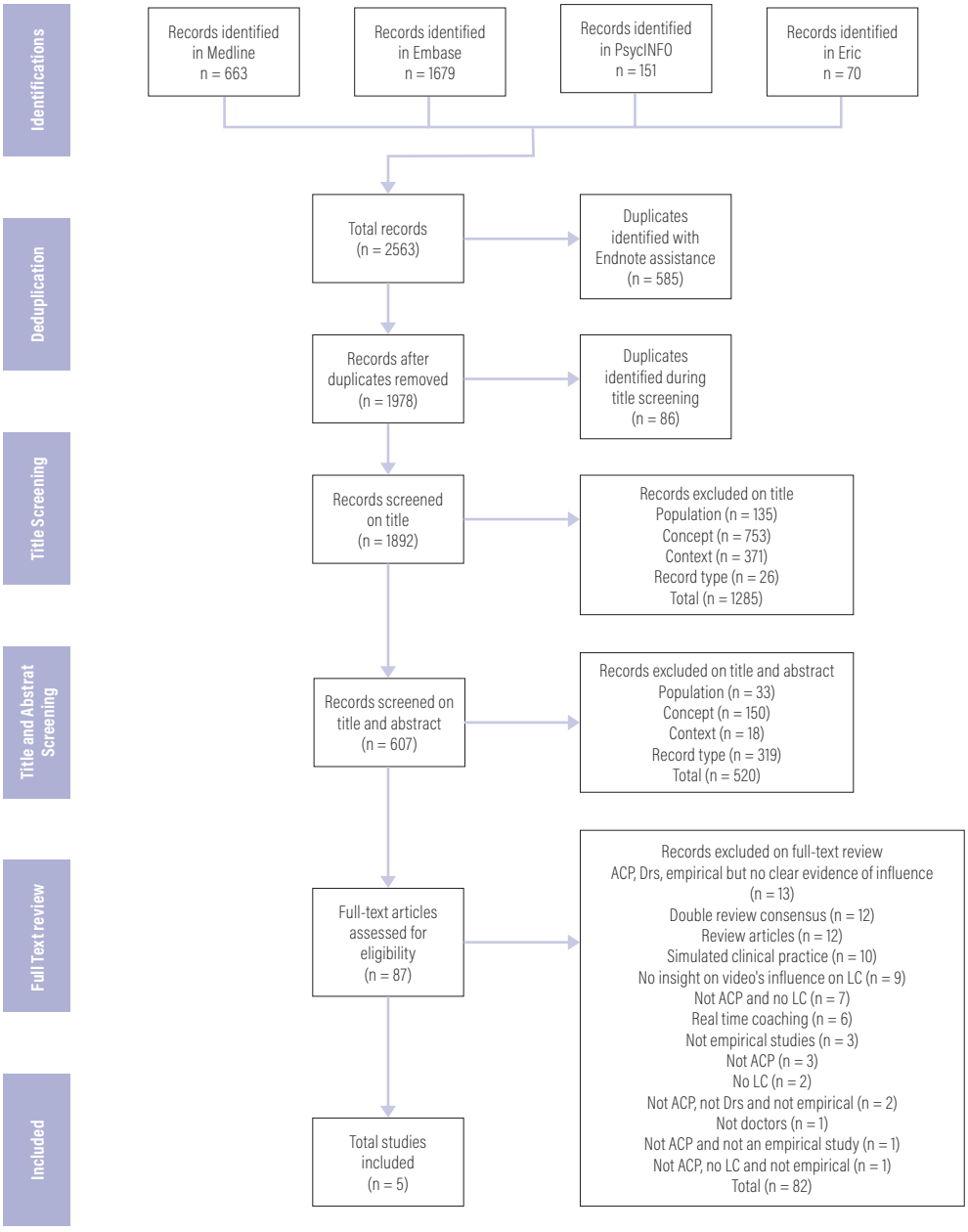
Term	Definition
Learning conversation	"A dialogue informed by an educator's observations of a learner's behaviour in actual or simulated clinical practice, conducted with the intention of improving future performance" (Tavares et al., 2020, p. 1020)
Clinical practice	Real-world, in-vivo execution of a doctor's duties in the workplace as defined by the CanMEDS Physician Competency Framework (Frank et al., 2015). Typically, this will be encounters with real (not simulated) patients. However, other duties, such as case conferences, teaching, etc., will be considered acceptable, as they form part of a doctor's duties as defined the CanMEDS Physician Competency Framework.
Postgraduate medical education	Training of registered medical practitioners (i.e., not medical students), including both vocational trainees and post-specialisation doctors (i.e., continuing medical education).

Step 3: Study selection

We chose to include only peer-reviewed articles to increase the academic rigour of our study. Inclusion criteria, in overview, were: (1) empirical studies that contained evidence of video's influence on learning conversations, (2) reported in the English language and (3) published from 2010 onwards, due to the advent of digital video. Articles pertaining to medical students, simulated practice and real-time feedback or coaching aimed primarily at *present* performance (and not fitting the learning conversation definition of a dialogue

Figure 1

Modified PRISMA Flowchart



aimed at *future* performance) were excluded. Full inclusion and exclusion criteria can be reviewed in Appendix 1.

While all studies we selected contained data relating to video's influence on the learning conversation, no study we selected had the *influence* of video on learning conversations as the primary phenomenon of interest.

Articles were screened in a three-stage process outlined in Figure 1—Modified PRISMA flowchart. The title and abstract screening were performed by a single author (AYH). Where there was uncertainty about whether a study should be included or excluded, it was progressed to the next stage of screening. At full-text review, if uncertainty existed, records were double reviewed by coauthors (EM, AR and MB) and resolved by consensus. The full dataset corresponding to the PRISMA flowchart is available for download in Endnote format at figshare.com (Huang et al., 2022). References of included articles were hand searched for additional articles.

Step 4: Charting the data

A data extraction table based on our research question was piloted, with the initial headings of details, methodology, population, concept, context and findings. We charted both "general information about the study and specific information" (Arksey & O'Malley, 2005, p. 26) pertinent to our research question. Our table charted quantitative data about participant attitudes and educational design features we believed were relevant to the learning conversation, i.e., whether the video was curated prior to review, who had the power to stop or start the video during the learning conversation and whether educators were present and directly observed the learner during the recording. Qualitative data relating to our research question was extracted from participant quotations and researcher observations documented in the results sections of the studies.

Step 5: Data analysis and presentation

The quantitative data was analysed to provide contextual information about video's influence on learning conversations. We organised the qualitative data thematically (Arksey & O'Malley, 2005) to generate themes that would answer our research question on how video influenced learning conversations. Previous literature reviews (Cook et al., 2010; Mills et al., 2021; Ng et al., 2020) have incorporated qualitative analysis in the methods. Consistent with these studies, and as suggested by Bearman & Dawson (2013), we employed thematic analysis (Braun & Clarke, 2006) to help develop and organise the themes. We reviewed and refined the themes as a group.

The research was informed by our diverse backgrounds: two medically qualified practitioners (AYH and AR), one practising clinician and medical educator (AYH), two academic clinicians (AR and EM) and three predominantly educational researchers (EM, AR and MB). AYH has an interest in technology and learning and undertook this study as part of a PhD program; AR has previously published on video for feedback and

reflection in medical students; MB and EM have written on trust and vulnerability, and feedback in health professional education.

Results

Study characteristics

Five studies were identified for this review (Hall & Pyper, 2021; Hu et al., 2017; Hu et al., 2012; Isreb et al., 2021; Phillips & Allbutt, 2021). Four studies were from the surgical context and one from general practice. We characterised studies according to a technical or behavioural skills focus as proposed by Murphy et al. (2019): one was behavioural; three were technical; and one studied both behavioural and technical skills. Qualitative methodology was used in three studies and mixed methodology in two. Studies were exclusively from Global North countries—note that the Global North generally includes nations that benefitted from colonialism, such as the US, Canada, England and nations of the European Union (Braff & Nelson, 2022). All studies included learners in the vocational educational stages of training, and one (Hu et al., 2012) also included continuing medical education.

Contexts of the learning conversations

Contextual factors around how video is used in the learning conversation might ultimately influence the learning conversation itself. This data includes information about the way that video is perceived and experienced by learners and patients, which may, in turn, influence whether video-assisted learning conversations take place. Three studies reported that participants were positive towards video-assisted coaching. (See the "participant attitudes" column in Table 2—Overview of results and general information about the context of video's integration into the learning conversation.) All studies reported whether learning conversations were conducted individually or in groups, but other contextual educational design features were absent or poorly described. Two studies did not report whether learners were given access to the video prior to the learning conversation; no study described whether learners assessed themselves by watching the video prior to the learning conversation (See the "educational design details" column in Table 2). The absence of these educational design details has implications for making judgements about the influence of video on the learning conversation from the collected study findings, which we explicate in our discussion.

Thematic analysis

We generated four themes from the qualitative data relating to the influence of video upon learning conversations: (1) video captures performance data that can be analysed together; (2) video enables the learning conversation to take place in a different environment; (3) video changes the teaching approaches of educators; and (4) video may promote learner agency and voice.

Table 2

Overview of Results and General Information About the Context of Video's Integration Into the Learning Conversation

First Author (Year) DOI	Global North/ South (Country)	Type of PGME*	Specialty; Type of Skill	Research Methodology and Design	Participant Attitudes	Educational Design Details: Learner Access; LC Individual/Group; Self-Assessment
Hall (2021) https://doi.org/10.36834/cmej.71455#http://doi.org/10.36834/cmej.71455#	Global North (Canada)	Vocational training	Obstetrics and gynaecology; technical (surgery)	Qualitative: Content analysis of intraoperative dialogue	N/A	Access not stated; Individual; Not stated
Hu (2012) https://doi.org/10.1016/j.jamcollsurg.2011.10.009#http://doi.org/10.1016/j.jamcollsurg.2011.10.009#	Global North (USA)	Vocational training and continuing medical education	Surgery: general; technical (surgery)	Qualitative: Grounded theory analysis of learning conversations	Learners "universally endorsed" video-assisted learning conversations	Learner access permitted; Group; Not stated
Hu (2017) https://doi.org/10.1001/jamasurg.2016.4619#http://doi.org/10.1001/jamasurg.2016.4619#	Global North (USA)	Vocational training	Surgery: general; technical (surgery)	Mixed methods: Quantitative (statistical tests of coded data) Qualitative ("iterative inductive coding" learning conversations and intraoperative dialogue	Study participants positive towards video-assisted learning conversations	Access not stated; Individual; Not stated
Isreb (2020) https://doi.org/10.1016/j.jsurg.2020.07.014#http://doi.org/10.1016/j.jsurg.2020.07.014#	Global North (UK)	Vocational training	Surgery: general; both technical (surgery) and behavioural (communication)	Mixed methods: Quantitative - performance Qualitative - thematic analysis of educator and learner interviews	All participants favoured video-assisted learning conversations over standard feedback practices	No access; Individual; Not stated
Phillips (2021) https://doi.org/10.1080/14739879.2021.1920473#http://doi.org/10.1080/14739879.2021.1920473#	Global North (UK: Scotland)	Vocational training	General practice; behavioural (communication)	Qualitative: Qualitative analysis of peer feedback sessions and post-intervention interviews and emails	N/A	Learner access permitted; Group; Not stated

* vocational training = doctors on a specialist training programme, known as registrars in the UK and Australia; continuing medical education = doctors who have completed specialist training

ISSN 1442-1100

Video captures performance data that can be analysed together

Some studies suggested that video can enable learners and educators to see what they could not see before, or see things from a different perspective. As one learner notes, "and now watching it, I do (recognise it) too, cause I see it now" (Hall & Pyper, 2021, p. 67). The research also highlighted that video can increase the accuracy and value of learning conversations by augmenting memory (Isreb et al., 2021) and by providing visual cues to anchor or prompt learning conversations (Hall & Pyper, 2021; Hu et al., 2017; Hu et al., 2012). Those visual cues appeared to scaffold the narration and discussion by illustrating what the learner or educator was trying to explain verbally. Furthermore, if peers were also present during the learning conversation, video could act as an exemplar of practice, allowing learners to realise they were not alone in their struggles: "When you are floundering a bit you can feel like you are the only one that's floundering and it can be good to see that everyone else is having these same difficulties" (Phillips & Allbutt, 2021, p. 359). Video might also facilitate the recognition of previously unspoken (from the learner perspective) and unperceived (from the educator perspective) knowledge gaps during the learning conversation: "I remember at one point you said to … kocherize the duodenum by feel, and I was like, 'No idea how to do that'" (Hu et al., 2017, p. 320). In this quote, we inferred a degree of learner vulnerability. But it was not just the learners. An educator, in response to a learner narrating the video while analysing it together, modelled reciprocal vulnerability by admitting their own fallibility, with comments such as "I buggered a middle colic one time ... doing exactly that maneuver" (Hu et al., 2012, p. 118).

Video enables the learning conversation to take place in a different environment

We interpreted that video may be able to influence the learning conversation in a surgical context by separating the learning conversation from the performance of the clinical task. We inferred from educator comments that those working in the theatre environment can be too busy concentrating on the clinical task to focus on giving or receiving real-time feedback or coaching (Hu et al., 2017; Isreb et al., 2021). This may have the effect of dividing the educator's and learner's attention and influence their ability to engage in the learning conversation during the clinical task. As one educator pointed out, "Having the recording really helps you to look at things again without also being consumed by doing the operation so … I think (video's) a very useful (tool) for feedback" (Isreb et al., 2021, p. 4). As another educator stated, "You get more time to ask questions. … You don't feel like, 'Well, we have to finish this operation, and I'll learn about this later.' Well, now it's later, and we can go more in detail" (Hu et al., 2017, p. 322). Using video to retrospectively analyse the clinical performance away from the operating theatre can narrow the educator's focus to the learning conversation itself rather than juggling service and educational demands: "I think you probably do see more (during the learning conversation away from the operating theatre) than you do when you're doing a

procedure. I think you're more aware because you're not concentrating on anything else, you're just focusing on the video" (Isreb et al., 2021, p. 4).

Video changes the teaching approaches of educators

Our interpretation of the qualitative data from surgical settings suggests that video can create an opportunity for educators to change their teaching approaches. One educator suggested that video might prompt a change from unidirectional learning conversations to dialogues for learning:

> It's just a sheet of paper with tick boxes [referring to an assessment form] and it really doesn't help. ... The whole learning is involved in the feedback, the actual feedback that you give to the [learner]. That's where the benefit is, and this is quite like that obviously ... because you are watching a procedure together. (Isreb et al., 2021, p. 5)

We discerned from a quotation in the same study how video can allow educators to reflect on their own performance in the operating theatre and provide an impetus for the educator to change. After watching their performance, one educator commented, "I think maybe I need to be more explicit, or reflect on how explicit I am in my verbal instruction" (Isreb et al., 2021, p. 5). In another example, an educator watching their own shortcomings as a surgical assistant displayed vulnerability and then made it into a teaching point: "So now, here, tell your camera person to follow you into the pelvis. Who was holding the camera here? Oh, was that me?" (Hall & Pyper, 2021, p. 66). It may be that the presence of video prompted reflection-on-action by the educator.

Video may promote learner agency and voice

There was implicitly more control given to learners within some learning conversations where they were invited to control the video. For example, Phillips and Allbutt (2021) describe their educational design: "Videos allowed the trainees to stop and start the consultations to explain their thinking and for peers to rewind or review" (p. 358). Giving the learners the freedom to stop and start the video may grant agency to the learner. In another example, we interpreted video or educational design as possibly promoting learner voice: "There was no hesitancy by the residents to ask questions, request clarity about a comment or state their own reflection on their perception of their video performance" (Hall & Pyper, 2021, p. 66). In a further example, "All (learners) used an explanatory technique to engage the (educator) at some point during their session; they fast forwarded to points of interest and narrated the events being replayed" (Hu et al., 2012, p. 117). So, by promoting learner voice through these invitations for commentary on the video, the educator may promote more engaging learning conversations.

Discussion

Our introduction speculated that during learning conversations in postgraduate medical education, how and by whom clinical practice video was used is an important factor in how video might influence the learning conversation. From our thematic analysis, especially the theme "video may promote learner agency and voice", we inferred that educational design possibly influenced the learning conversation, that is, video paired with purposeful design elements might create the possibility for greater learner engagement and contribution to the conversation. However papers in our sample provided incomplete or thin details on educational design, which is consistent with findings in the simulation literature (Ali & Miller, 2018; Cheng et al., 2014; Levett-Jones & Lapkin, 2014). The implication of this finding is that greater attention should be given to, and greater emphasis placed on, the reporting of educational design associated with video implementation in future research studies.

We now discuss the limited evidence within our analysis and its implications around three ideas. Firstly, we outline how video acts as a visual record to inform learning conversations. Secondly, we consider how video changes what educators do within learning conversations. Finally, we look beyond our dataset to consider how learners' perceptions may influence the use of video in learning conversations and by implication video's influence on the learning conversation.

Video as a visual record that informs learning conversations

Based on the theme "video captures performance data that can be analysed together", our study highlights the role of video as a shared visual record. Freire (2000) has noted that when learners simultaneously reflect on themselves and the world, they begin to increase their scope of perception and direct their observation towards previously inconspicuous phenomena. Video might direct learner attention to previously inconspicuous phenomena by allowing learners to review their own performance and discover their own strengths and weaknesses (Dohms et al., 2020; Moore et al., 2018; Sherman et al., 2018). Self-review and self-discovery may positively influence acceptance of the learning conversation by incorporating elements of learner self-assessment (Ramani et al., 2019). Additionally, clinicians are "at times unable to 'see', much less discuss, the taken-for-granted—though crucial—aspects of their work" (Iedema et al., 2019, p. 18), and there might be many reasons for this inability to see. The reasons include what is referred to in the literature as "inattentional blindness", where someone overlooks particular objective realities (Chabris & Simons, 2010). These oversights can lead to differing memories, contested facts and inaccessible knowledge. The theme "video captures performance data that can be analysed together" suggested that video might address imperfect recall by acting as an aide memoir (Isreb et al., 2021) and address gaps in learner perception by uncovering their oversights (Isreb et al., 2021; Moore et al., 2018). In facilitating self-discovery for the learner, we speculate that using video might avoid the need for the educator to provide negative messages and potentially precipitate learner defensiveness. Finally, like learners,

educators can also suffer from inattentional blindness. Video can allow the educator to review the learner's performance away from the distractions and pressures of clinical practice (Hu et al., 2017; Isreb et al., 2021).

Video's influence on educators in the learning conversation

In our analysis, we saw video influencing educators in the learning conversation by influencing their teaching approaches and by changing where the learning conversations occurred. Delivering negative messages can be perceived by educators as an unpleasant task (Watling & Lingard, 2012). Educators perceive the need to preserve their working relationships with learners in the postgraduate medical education context, and this need is a barrier to effective learning conversations (Ramani et al., 2019). Video might address the emotional dimensions of educator reluctance to deliver commentary on substandard performance. It can act as a medium to replay the incident without judgement and explore the meaning of the event with the learner (Mazer et al., 2018). Used in this way, video might address the phenomena of intentionally vague messages reported in clinical supervision (Scarff et al., 2019a). Educators also need to balance the tension between service delivery and teaching. This tension of balancing efficiency, patient care and learning was demonstrated in a Canadian study by Watling et al. (2016). Video possibly provides a solution to help manage this tension. We saw evidence for this in the theme "video enables the learning conversation to take place in a different environment", where video facilitates a decoupling of the observer and the care-provider role.

Going a step further, video might also disrupt established unproductive learning conversation rituals. For example, the educator talks and the learner listens for more than 90% of an average learning conversation (Molloy, 2009). Rather than the learner "doing", and the educator watching then delivering an assessment message, some of the studies in our scoping review suggest that video may have a role to play in facilitating emergent discovery and co-construction of learning. The learner and educator roles remain unchanged, but video might position both parties as observers of performance during the learning conversation. This subtle repositioning for both educator and learner as observers possibly changes the interpersonal dynamic in multiple ways: changing positions from vis-a-vis to parallel or angulated positions according to Martin is associated with more frequent communication (Martin, 2021); in the theme "video might promote learner agency and voice", we saw learners possibly feeling empowered to speak up by allowing learners to comment on the video; and for the medical educator, video might be the catalyst for establishing a different type of ritual when it comes to learning conversations, one where both learner and educator watch and analyse a shared artefact together (Molloy & Bearman, 2019).

Learner perceptions of video and their influence on learning conversations

If the "participant attitudes" column of Table 2 were the sole source of data, it could be claimed that video is only perceived positively by learners. However, several studies

investigating the use of clinical practice videos in learning conversations (which do not touch on how they influence the tenor of the learning conversations) demonstrate a more complex picture than our sample represents (Bull et al., 2020; Dohms et al., 2020; Eeckhout et al., 2016; Jain et al., 2017; Lanier et al., 2017; Mazer et al., 2018; Merriam et al., 2018; Moore et al., 2018; Noordman et al., 2019; Parker et al., 2019; Ryg et al., 2016; Sahyouni et al., 2017; Sherman et al., 2018; Wouda & van de Wiel, 2014). Some surveys within these papers describe at least initial anxiety and discomfort towards using video (Dohms et al., 2020; Eeckhout et al., 2016; Merriam et al., 2018; Parker et al., 2019; Sherman et al., 2018). In one study, no learner volunteered to participate in a video-assisted learning conversation (Ryg et al., 2016). These studies suggest that if learners perceive video as threatening, they may avoid participating in learning and/or learning conversations. Thus, while not a direct influence on how the learning conversation is formed, video may prevent learning conversations from happening altogether. In the simulation literature, expert practitioners have suggested that incorporating video into learning conversations may be harmful without appropriate educator training (Krogh et al., 2015). One paper in our study echoed this by warning that "video review alone is not enough; the expertise of a coach in facilitating reflection is critical" (Hu et al., 2017, p. 324). As an example, an untrained educator could use video to show deficits in the learner's skills that might be perceived as "gotcha" moments. In this type of scenario, for example, an educator observing hand hygiene might notice the learner had missed a step. During the learning conversation, the learner might declare that they had completed all the steps. The gotcha moment occurs when the educator then uses the video as contrary evidence to correct the learner's recollection. Video used this way might undermine learner self-confidence, remove the opportunity for learner agency and magnify the educator's delivery as a monologic assessment message.

Limitations

As we chose to focus this study on clinically based vocational training where medical learners are already qualified and working, the applicability of our findings to undergraduate programs and other health professions may be limited. Our results were highly reliant on a small set of papers on research in the surgical context. Future empirical studies focused on behavioural skills or sampling purposefully across both behavioural and technical skills would increase representation of behavioural skills on how video works. Another shortcoming was the scant detail describing the educational design of the video-based learning encounter, which limits the conclusions we can draw from the data. Future research that makes educational design choices explicit would help to advance this field of inquiry. Our study may also suffer from several implicit biases: we started this project with a positive bias towards video that has diminished as our familiarity with the literature increased, and our study may suffer from publication bias, which may impact the trustworthiness of our results; our sample may suffer from cultural bias, being published exclusively from Global North cultures; and our study may be biased towards

learners' experiences because of sampling, potentially impacting the representativeness, relevance and applicability of our findings. Finally, we note that the thematic analysis is based on a relatively small dataset, and this highlights the need for further focused studies of this phenomenon.

Conclusion and future directions

We conclude from our literature review that video may influence learning conversations through capturing clinical performance data that can be analysed together by learners and educators. The impact on the learning conversation may be explained by enabling the learning conversation to take place in a different environment, changing the teaching approaches of educators and promoting learner voice in the learning conversation. This study also directs us to several gaps in the academic literature, and we believe that the topic is worthy of further exploration given the potential that video demonstrates in addressing some shortcomings reported in traditional learning conversations. We suggest further research looking specifically at the phenomenon of *how* video influences the learning conversation, through observational research approaches and/or in-depth interviews to capture participants' experiences of the video-triggered learning conversation.

Acknowledgements

We wish to thank Austin Health clinical librarians Ms Helen Baxter and Dr Liz Harris for their input into and review of the search protocol and search terms and A/Prof Damian Castanelli for reviewing the manuscript.

Conflicts of interest and funding

No funding was received for this scoping review. The authors declare no conflicts of interest.

References

Ali, A. A., & Miller, E. T. (2018). Effectiveness of video-assisted debriefing in health education: An integrative review. *The Journal of Nursing Education*, *57*(1), 14–20. https://doi.org/10.3928/01484834-20180102-04

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Bearman, M., & Dawson, P. (2013). Qualitative synthesis and systematic review in health professions education. *Medical Education*, *47*(3), 252–260. https://doi.org/10.1111/medu.12092

Braff, L., & Nelson, K. (2022). The global north: Introducing the region. In N. Fernandez & K. Nelson (Eds.), *Gendered lives: Global issues* (pp. 289–307). State University of New York. https://milnepublishing.geneseo.edu/genderedlives/chapter/chapter-15-the-global-north-introducing-the-region/

Brand, P. L. P., Jaarsma, A. D. C., & van der Vleuten, C. P. M. (2020). Driving lesson or driving test? *Perspectives on Medical Education*, *10*(1), 50–56. https://doi.org/10.1007/s40037-020-00617-w

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bull, N. B., Silverman, C. D., & Bonrath, E. M. (2020). Targeted surgical coaching can improve operative self-assessment ability: A single-blinded nonrandomized trial. *Surgery*, *167*(2), 308–313. https://doi.org/10.1016/j.surg.2019.08.002

Chabris, C. F., & Simons, D. J. (2010). *The invisible gorilla: And other ways our intuition deceives us*. HarperCollins.

Cheng, A., Eppich, W., Grant, V., Sherbino, J., Zendejas, B., & Cook, D. A. (2014). Debriefing for technology-enhanced simulation: A systematic review and meta-analysis. *Medical Education*, *48*(7), 657–666. https://doi.org/10.1111/medu.12432

Cook, D. A., Erwin, P. J., & Triola, M. M. (2010). Computerized virtual patients in health professions education: A systematic review and meta-analysis. *Academic Medicine*, *85*(10), 1589–1602. https://doi.org/10.1097/ACM.0b013e3181edfe13

Davis, K., Drey, N., & Gould, D. (2009). What are scoping studies? A review of the nursing literature. *International Journal of Nursing Studies*, *46*(10), 1386–1400. https://doi.org/10.1016/j.ijnurstu.2009.02.010

Dohms, M. C., Collares, C. F., & Tibério, I. C. (2020). Video-based feedback using real consultations for a formative assessment in communication skills. *BMC Medical Education*, *20*, Article 57. https://doi.org/10.1186/s12909-020-1955-6

Eeckhout, T., Gerits, M., Bouquillon, D., & Schoenmakers, B. (2016). Video training with peer feedback in real-time consultation: Acceptability and feasibility in a general-practice setting. *Postgraduate Medical Journal*, *92*(1090), 431–435. https://doi.org/10.1136/postgradmedj-2015-133633

Epistemonikos. (n.d.). *Home page*. Retrieved November 16, 2020, from https://www.epistemonikos.org/

Frank, J. R., Snell, L., & Sherbino, J. (Eds.). (2015). *CanMEDS 2015 physician competency framework*. Royal College of Physicians and Surgeons of Canada. https://www.royalcollege.ca/content/dam/document/standards-and-accreditation/2015-canmeds-framework-reduced-e.pdf

Freire, P. (2000). *Pedagogy of the oppressed* (30th anniversary ed.). Continuum. https://envs.ucsc.edu/internships/internship-readings/freire-pedagogy-of-the-oppressed.pdf

Garden, A. L., Le Fevre, D. M., Waddington, H. L., & Weller, J. M. (2015). Debriefing after simulation-based non-technical skill training in healthcare: A systematic review of effective practice. *Anaesthesia and Intensive Care*, *43*(3), 300–308. https://doi.org/10.1177/0310057X1504300303

Goldman, L. I., Maier, W. P., Rosemond, G. P., Saltzman, S. W., & Cramer, L. M. (1969). Teaching surgical technique by the critical review of videotaped performance: The surgical instant replay. *Surgery*, *66*(1), 237–241.

Hall, J. M., & Pyper, J. S. (2021). Exploring the nature and focus of feedback when using video playback in gynecology laparoscopy training. *Canadian Medical Education Journal*, *12*(6), 62–71. https://doi.org/10.36834/cmej.71455

Hu, Y.-Y., Mazer, L. M., Yule, S. J., Arriaga, A. F., Greenberg, C. C., Lipsitz, S. R., Gawande, A. A., & Smink, D. S. (2017). Complementing operating room teaching with video-based coaching. *JAMA Surgery*, *152*(4), 318–325. https://doi.org/10.1001/jamasurg.2016.4619

Hu, Y.-Y., Peyre, S. E., Arriaga, A. F., Osteen, R. T., Corso, K. A., Weiser, T. G., Swanson, R. S., Ashley, S. W., Raut, C. P., Zinner, M. J., Gawande, A. A., & Greenberg, C. C. (2012). Postgame analysis: Using video-based coaching for continuous professional development. *Journal of the American College of Surgeons*, *214*(1), 115–124. https://doi.org/10.1016/j.jamcollsurg.2011.10.009

Huang, A. Y., Molloy, E., Ryan, A., & Bearman, M. (2022). *Scoping literature review dataset: How does video of clinical practice influence learning conversations in postgraduate medical education?* [dataset]. University of Melbourne. https://doi.org/10.26188/20101121

Iedema, R., Carroll, K., Collier, A., Hor, S., Mesman, J., & Wyer, M. (2019). *Video-reflexive ethnography in health research and healthcare improvement: Theory and application*. CRC Press. https://doi.org/10.1201/9781351248013

Isreb, S., Attwood, S., Hesselgreaves, H., McLachlan, J., & Illing, J. (2021). Synchronized video-review as a tool to enhance reflection and feedback: A design-based feasibility study. *Journal of Surgical Education*, *78*(1), 1–8. https://doi.org/10.1016/j.jsurg.2020.07.014

Jain, N. S., Schwarzkopf, R., & Scolaro, J. A. (2017). Video review as a tool to improve orthopedic residents' performance of closed manipulative reductions. *Journal of Surgical Education*, *74*(4), 663–667. https://doi.org/10.1016/j.jsurg.2017.01.003

Johnson, C. E., Keating, J. L., Farlie, M. K., Kent, F., Leech, M., & Molloy, E. K. (2019). Educators' behaviours during feedback in authentic clinical practice settings: An observational study and systematic analysis. *BMC Medical Education*, *19*, Article 129. https://doi.org/10.1186/s12909-019-1524-z

Johnson, C. E., Watling, C. J., Keating, J. L., & Molloy, E. K. (2020). Effective feedback conversations in clinical practice. In D. Nestel, G. Reedy, L. McKenna, & S. Gough (Eds.), *Clinical education for the health professions: Theory and practice* (pp. 1–18). Springer. https://doi.org/10.1007/978-981-13-6106-7_53-1

Krogh, K., Bearman, M., & Nestel, D. (2015). Expert practice of video-assisted debriefing: An Australian qualitative study. *Clinical Simulation in Nursing*, *11*(3), 180–187. https://doi.org/10.1016/j.ecns.2015.01.003

Lanier, C., Dominice Dao, M., Hudelson, P., Cerutti, B., & Junod Perron, N. (2017). Learning to use electronic health records: Can we stay patient-centered? A pre-post intervention study with family medicine residents. *BMC Family Practice*, *18*, Article 69. https://doi.org/10.1186/s12875-017-0640-2

Levett-Jones, T., & Lapkin, S. (2014). A systematic review of the effectiveness of simulation debriefing in health professional education. *Nurse Education Today*, *34*(6), 58–63. https://doi.org/10.1016/j.nedt.2013.09.020

Martin, R. (Ed.). (2021). *The management of procedure-induced anxiety in children*. Cambridge University Press. https://doi.org/10.1017/9781108913317.004

Mazer, L. M., Hu, Y.-Y., Arriaga, A. F., Greenberg, C. C., Lipsitz, S. R., Gawande, A. A., Smink, D. S., & Yule, S. J. (2018). Evaluating surgical coaching: A mixed methods approach reveals more than surveys alone. *Journal of Surgical Education*, *75*(6), 1520–1525. https://doi.org/10.1016/j.jsurg.2018.03.009

Merriam, S. B., Spataro, B., Hamm, M. E., McNeil, M. A., & DiNardo, D. J. (2018). Video observation with guided reflection: A method for continuing teaching education. *Journal of Graduate Medical Education*, *10*(4), 416–422. https://doi.org/10.4300/JGME-D-17-00692.1

Mills, L. M., Boscardin, C., Joyce, E. A., ten Cate, O., & O'Sullivan, P. S. (2021). Emotion in remediation: A scoping review of the medical education literature. *Medical Education*, *55*(12), 1350–1362. https://doi.org/10.1111/medu.14605

Molloy, E. (2009). Time to pause: Giving and receiving feedback in clinical education. In C. Delany & E. Molloy (Eds.), *Clinical education in the health professions* (pp. 128–146). Churchill Livingston Elsevier.

Molloy, E., & Bearman, M. (2019). Embracing the tension between vulnerability and credibility: "Intellectual candour" in health professions education. *Medical Education*, *53*(1), 32–41. https://doi.org/10.1111/medu.13649

Moore, M. D., Abelson, J. S., O'Mahoney, P., Bagautdinov, I., Yeo, H., & Watkins, A. C. (2018). Using GoPro to give video-assisted operative feedback for surgery residents: A feasibility and utility assessment. *Journal of Surgical Education*, *75*(2), 497–502. https://doi.org/10.1016/j.jsurg.2017.07.024

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, *18*, Article 143. https://doi.org/10.1186/s12874-018-0611-x

Murphy, P., Nestel, D., & Gormley, G. J. (2019). Words matter: Towards a new lexicon for "nontechnical skills" training. *Advances in Simulation*, *4*, Article 8. https://doi.org/10.1186/s41077-019-0098-5

National Institute for Health and Care Research (NIHR). (n.d.). *Welcome to PROSPERO*. University of York Centre for Reviews and Dissemination. Retrieved November 16, 2020, from https://www.crd.york.ac.uk/prospero/

Ng, Y. X., Koh, Z. Y. K., Yap, H. W., Tay, K. T., Tan, X. H., Ong, Y. T., Tan, L. H. E., Chin, A. M. C., Toh, Y. P., Shivananda, S., Compton, S., Mason, S., Kanesvaran, R., & Krishna, L. (2020). Assessing mentoring: A scoping review of mentoring assessment tools in internal medicine between 1990 and 2019. *PLOS ONE*, *15*(5), Article e0232511. https://doi.org/10.1371/journal.pone.0232511

Noordman, J., Post, B., van Dartel, A. A. M., Slits, J. M. A., & olde Hartman, T. C. (2019). Training residents in patient-centred communication and empathy: Evaluation from patients, observers and residents. *BMC Medical Education*, *19*, Article 128. https://doi.org/10.1186/s12909-019-1555-5

Parker, H., Farrell, O., Bethune, R., Hodgetts, A., & Mattick, K. (2019). Pharmacist-led, video-stimulated feedback to reduce prescribing errors in doctors-in-training: A mixed methods evaluation. *British Journal of Clinical Pharmacology*, *85*(10), 2405–2413. https://doi.org/10.1111/bcp.14065

Peters, M., Godfrey, C., McInerney, P., Munn, Z., Trico, A., & Khalil, H. (2020). Chapter 11: Scoping reviews. In E. Aromataris & Z. Munn (Eds.), *JBI manual for evidence synthesis*. JBI. https://doi.org/10.46658/JBIMES-20-12

Phillips, R., & Allbutt, H. (2021). Peer feedback on video consultations for GPST1s in S.E. Scotland: A pilot study using the framework method. *Education for Primary Care : An Official Publication of the Association of Course Organisers, National Association of GP Tutors, World Organisation of Family Doctors*, *32*(6), 356–362. https://doi.org/10.1080/14739879.2021.1920473

Ramani, S., Könings, K. D., Ginsburg, S., & van der Vleuten, C. P. M. (2019). Feedback redefined: Principles and practice. *Journal of General Internal Medicine*, *34*(5), 744–749. https://doi.org/10.1007/s11606-019-04874-2

Ryg, P. A., Hafler, J. P., & Forster, S. H. (2016). The efficacy of residents as teachers in an ophthalmology module. *Journal of Surgical Education*, *73*(2), 323–328. https://doi.org/10.1016/j.jsurg.2015.10.014

Sahyouni, R., Moshtaghi, O., Tran, D. K., Kaloostian, S., Rajaii, R., Bustillo, D., & Chen, J. W. (2017). Assessment of Google Glass as an adjunct in neurological surgery. *Surgical Neurology International*, *8*, Article 68. https://doi.org/10.4103/sni.sni_277_16

Scarff, C. E., Bearman, M., Chiavaroli, N., & Trumble, S. (2019a). Keeping mum in clinical supervision: Private thoughts and public judgements. *Medical Education*, *53*(2), 133–142. https://doi.org/10.1111/medu.13728

Scarff, C. E., Bearman, M., Chiavaroli, N., & Trumble, S. (2019b). Trainees' perspectives of assessment messages: A narrative systematic review. *Medical Education*, *53*(3), 221–233. https://doi.org/10.1111/medu.13775

Sherman, M., Nissly, T., Friedrichsen, S., & Wootten, M. (2018). Video review process: Enhancing impact and resident/faculty satisfaction. *Peer-Reviewed Reports in Medical Education Research*, *2*(10). https://doi.org/10.22454/PRiMER.2018.152628

Tavares, W., Eppich, W., Cheng, A., Miller, S., Teunissen, P. W., Watling, C. J., & Sargeant, J. (2020). Learning conversations: An analysis of the theoretical roots and their manifestations of feedback and debriefing in medical education. *Academic Medicine*, *95*(7), 1020–1025. https://doi.org/10.1097/ACM.0000000000002932

Watling, C., LaDonna, K. A., Lingard, L., Voyer, S., & Hatala, R. (2016). "Sometimes the work just needs to be done": Socio-cultural influences on direct observation in medical training. *Medical Education*, *50*(10), 1054–1064. https://doi.org/10.1111/medu.13062

Watling, C., & Lingard, L. (2012). Toward meaningful evaluation of medical trainees: The influence of participants' perceptions of the process. *Advances in Health Sciences Education*, *17*(2), 183–194. https://doi.org/10.1007/s10459-010-9223-x

Wouda, J. C., & van de Wiel, H. B. M. (2014). The effects of self-assessment and supervisor feedback on residents' patient-education competency using videoed outpatient consultations. *Patient Education and Counseling*, *97*(1), 59–66. https://doi.org/10.1016/j.pec.2014.05.023

Zhang, H., Goh, S. H. L., Wu, X. V., Wang, W., & Mörelius, E. (2019). Prelicensure nursing students' perspectives on video-assisted debriefing following high fidelity simulation: A qualitative study. *Nurse Education Today*, *79*, 1–7. https://doi.org/10.1016/j.nedt.2019.05.001

Zhang, H., Mörelius, E., Goh, S. H. L., & Wang, W. (2019). Effectiveness of video-assisted debriefing in simulation-based health professions education: A systematic review of quantitative evidence. *Nurse Educator*, *44*(3), E1–E6. https://doi.org/10.1097/NNE.0000000000000562