"A Video of Myself Helps Me Learn": A Scoping Review of the Evidence of Video-Making for Situated Learning

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Abstract

Nursing, dance and studio-based arts, engineering, and athletic therapy are viewed as practice-oriented professions in which the teaching and situated learning of practical skills are central. In order to succeed, students must perform a series of performance-based assessments, which seemingly require an "able" body to enact complex tasks in situated and/or simulation-based contexts (for example, "safe nursing practice"). Our interdisciplinary research seeks to intervene within the culture of professional learning by investigating what we know about the use of smartphone video recording for situated, practice-based learning, and for supporting interactive video-based assessment as a means of accommodation and extending access for students, including students with performance anxiety, mature students, ESL learners, students with disabilities, and students in remote communities. In this paper we employ a scoping review methodology to present our findings related to students' and instructors' perspectives on the use of smartphone video to demonstrate and document practical knowledge and practice-oriented competencies across fields in the arts and sciences. We also examine broader research, as well as the ethical and design implications for the development of our technology-based toolbox project – an online resource created to advance pedagogies deploying smartphones as tools for practical skills acquisition - and for accommodation - within multidisciplinary practical learning environments.

INTRODUCTION

Nursing, dance, engineering, athletic therapy and studio-based arts are viewed as practice-oriented professions in which the teaching and situated learning of practical skills are pedagogically central. In order to succeed, students must perform a series of performance-based assessments, which require students to enact complex practical tasks in situated and/or simulation-based contexts (for example, "safe nursing practices"). Studies demonstrate that when students record short video documents of themselves performing a practice-based skill (hereafter, "skills video") and receive feedback from instructors and/or peers, there is a significant increase ($p<.001$) in their feelings of engagement and of being supported within a community of learners (McIntosh, Patterson, & Miller, 2018). It is also the case that student learning is increased when students are allowed to re-watch their own practice-based skills videos, when compared to a control group that did not use video (Beiter et al., 2015; Heimberg et al., 2014; McIntosh et al., 2018; O'Carroll & Fisher, 2013; Yoo, Son, Kim, & Park, 2009; Yoo, Yoo & Lee, 2010).

Further, when students share their videos with others (peers and faculty) and have, during their video creation process, access to a haptic "task trainer" or simulation "prop" to practice and document hands-on skills, they forge a relationship between self and others that supports confidence and learner success (Lizzio, 2006; Lizzio, Stokes, & Wilson, 2005). In an era when online and blended courses proliferate, adapting to diverse student needs is crucial for equity in higher education. In Ontario, under the Human Rights Code, post-secondary institutions have a duty to respond to reasonable requests for accommodation and to support the needs of all students, including students who self-identify as living with a disability or require further support in relation to barriers like living in remote communities (Condra et al., 2015; McNett, 2012; Redmond, Heffernan, Abawi, Brown, & Henderson, 2018). Educators need more and better resources and models in order to leverage the affordances of smartphones for learning in general, and online learning in particular (Dokumaci, 2018).

Despite evidence of the potential benefits of video technology as a pedagogical tool for practice-based skills, there remain many gaps in our understanding about how to best theorise and mobilize this form of technology as a dynamic pedagogical support (Botham & Nicholson, 2014). Here, work in Scholarship of Teaching and Learning (SoTL) can help us investigate the different ways of knowing and learning in higher education (e.g., experiential learning, "best practices" for elearning, use of simulations and modelling, situated learning in authentic contexts, *etc.*) (Gurm, 2013; Kurtz & Sponder, 2010). Further, the use of videomaking tools for practice-based learning and assessment also advances thematic concerns in SoTL - and connects those concerns with near-ubiquitous calls in higher education for experiential learning, innovations in online learning, and accommodation of/for diverse student populations.

In this article, we present a scoping review of prior scholarly inquiry into video-supported pedagogies as a means of documenting practice-based skills and for providing video-based assessments (using interactive software and video tools). This scoping review is timely, given the importance of practical skills-based learning, particularly in online contexts where remote students and students with disabilities may require accommodation to demonstrate their learning of practical skills, embodied knowledge, and/or complex practice-based procedures using the tools of the respective trades. There is a great deal of literature on faculty using video to deliver content in online and blended learning contexts. There is, however, a paucity of interdisciplinary literature on the uses of student and faculty created videos to model, learn, document (record) and then share practice-based skills —from critical techniques in health and nursing to the performance of dance in the arts. For instance, students might work together to create a short video of themselves performing a competence in

nursing (e.g., injection) while modelling both technical healthcare skills and crucial nurse/patient communicative practices associated with the skill being done properly and safely.

This scoping review, presented below, has in turn informed the work of an interdisciplinary team, bridging faculties of education, nursing, dance, and engineering, which is presently engaged in the development of an online resource to support students and faculty in using video tools in the modelling, learning, and assessment of situated practice-base skills, technical procedures, and/or embodied competences.

METHOD

Our research question queries the 'state-of-the-art', such as it is, in the use of smartphone videos in the teaching and learning of practice-based skills. A typical approach in pursuing this type of research question would be systematic review: to identify and synthesize the prior studies that are directly related. However, we seek to bridge across disciplines and across heterogeneous data sources and analyses (e.g., qualitative and quantitative data). Thus, the scoping review methodology is better suited for these reasons (Peters et al., 2015). Like systematic reviews, scoping reviews seek to formulate a research question and then to identify and synthesize studies that directly relate to this identified question. However, scoping reviews differ from systematic reviews in several key aspects (Peters et al., 2015). Scoping reviews bring together evidence from diverse sources, including both qualitative and quantitative data from a multiplicity of disciplines. Scoping reviews provide an overview of the existing evidence with the aim of "mapping" the research questions being asked (Colquhoun et al., 2014, p. 1292).

The scoping review methodology adopted here is guided by the scoping review methodologies developed by Arksey and O'Malley (2005) and the Joanna Briggs Institute (Khalil & Elkhider, 2016; Peters et al., 2015). We make use of a six-phase process (Arksey & O'Malley, 2005): identifying the research question(s) (phase 1); identifying and selecting relevant studies (phases 2, 3); a development display (phase 4) and a thematic representation of the findings (phase 5); The final phase (6) of the scoping review methodology is the use a research survey to establish consensus (or dissensus) with experts across these salient questions and themes identified in the previous phases.

Phase 1: Identifying the research question

In this first phase, we sought to identify and to selected prior scholarly work that is relevant to the question: what do we know about the use of video technology (e.g., smartphones) to teach, learn, and document a practice-based skill or embodied competence? And what modes of formative feedback and assessment are being mobilized in these digitally- mediated learning contexts?

Phases 2 and 3: Identification and Selection of Studies Relevant to the Research Question

We then developed, in consultation with a resource librarian, a list of electronic archives of scholarly works which included the Cumulative Index to Nursing and Allied Health Literature, ProQuest, JSTOR, PsycINFO, MEDLINE, and Cochrane Systematic Reviews. We focused on the time frame from 1996-2018. The starting year of 1996 safely precedes the period during which camera phones became widely available commercially (roughly in the early 2000's, depending on consumer market).

We performed a series of keyword searches across the titles, abstracts, and full-text of all articles for each of the electronic archives in our target list. We also performed a hand search of the gray literature (e.g., reference lists, websites) (See Appendix A-Prisma Table). These searches were performed independently by two research assistants and by two faculty researchers. The results were cross-checked for completeness. Once verified, all search results were entered into a master list.

Phase 4: Development and Display of Data

A set of key attributes for each study was developed and included: method of study, types of data collection, number of participants, analysis, outcomes/findings, and ethical considerations. We also developed an enumeration of some keywords to capture the foci of the different studies (e.g., video re-watching, peer review, technical obstacles, video annotation). These key attributes were then extracted for each of the identified articles on the master list. The foci list was developed iteratively. This work was divided among the project collaborators, where each researcher analyzed articles within their own disciplinary practice. The results were entered into a simple flat database. We adhered to Arksey and O'Malley's (2005) recommendations by being transparent in how data was identified and displayed.

A corpus of n=53 relevant students published between 1996 and 2018 were identified. A summary table is provided in Appendix B: Summary Table of Relevant Studies and Figure 1: Display of findings. The corpus was diverse in a number of different ways. First, we identified diversity among the disciplinary origin, which included chiropractic, midwifery, physiotherapy (n=8); nursing (n=10); medicine (n=10); dance (n=18); and engineering (n=7). Although the geographic representation of the sources overall was international, the majority of studies were performed in the United States.

Phase 5: A thematic display of the studies:

The fifth phase includes a thematic display of the data emerging from the studies. We encountered a broad range of specific practical skills that were the foci of the various studies. In health, the dominant practical skills included intramuscular injection, catheterization, the administration of blood products, and generic communication skills between health providers. In dance, a wider range of skills were included, ranging from dance technique and choreography skills to collaborative skills. Engineering focused on psychomotor skills, such as molding, building and navigating. A variety of video tools were covered in this set of studies, including video camera, VHS, CD-ROM, videoconferencing, mobile devices, smartphones, and laptops. A number of different study methodologies were observed: the pre/post quasi-experimental design (n=7) and the mixed-methods descriptive design (n=10) were the most common methods in the health and engineering disciplines. Sample sizes ranged from n=12 (Nilsen & Baerheim, 2005) to n=499 (Myung et al., 2010).

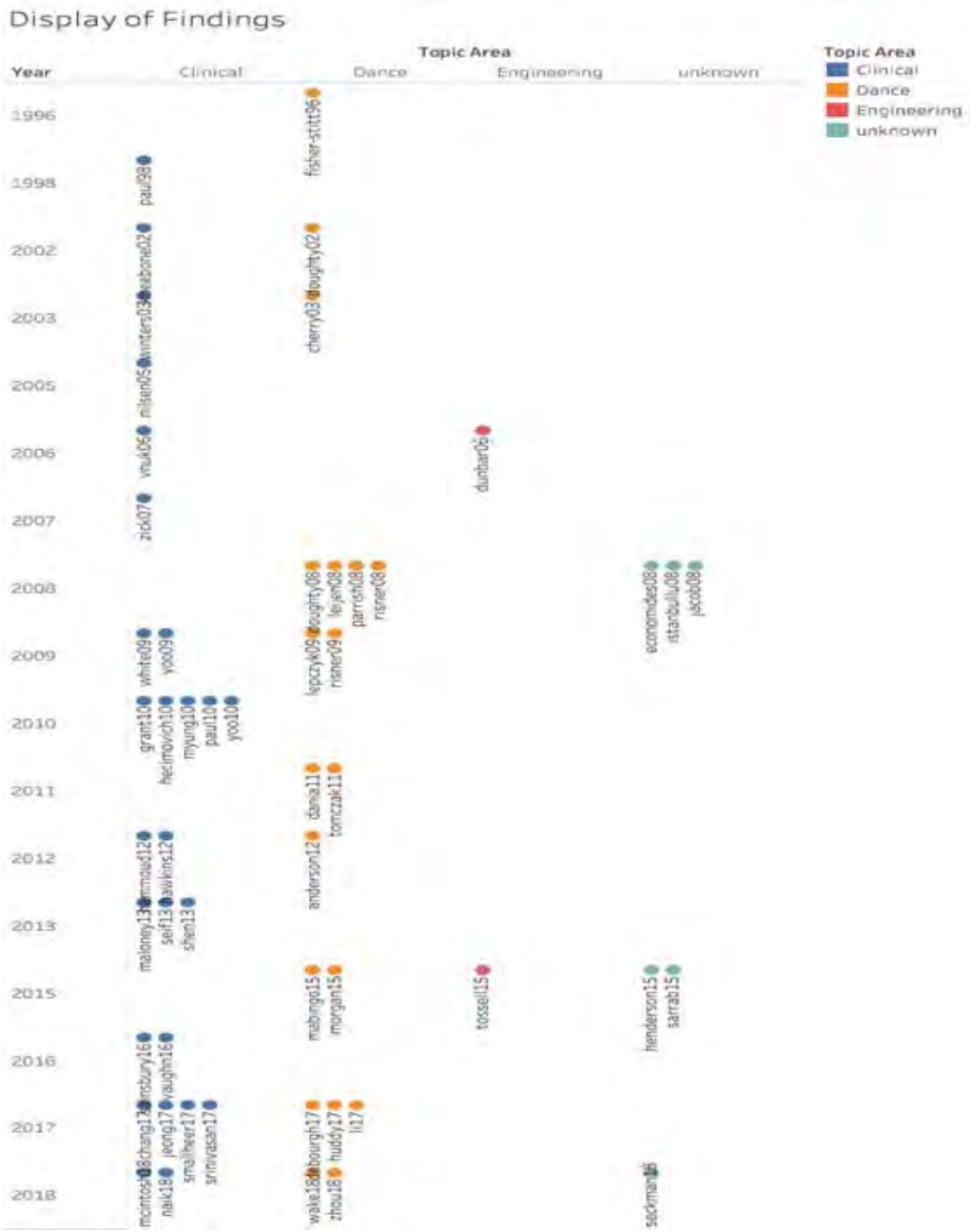

Figure 1: Display of Findings

When we clustered and displayed the studies according to foci, we found the following three themes:

- *Theme 1:* the role played by the student-created skills videos, the degree to which re-watching was provisioned for after they had been created, and the impact of, modes of, and beneficiaries of re-watching for learning.
- *Theme 2:* the use of annotations (feedback) on student skills videos, as well as the benefits and/or challenges this posed for instructors and/or peers.
- *Theme 3:* the sociotechnical aspects of skills video production and sharing (ethics, privacy, security; affordances and constraints for technology tools, networks, and infrastructure).

Theme 1: Re-watching skills videos as/for learning

In our resultant body of relevant studies (n=53), almost half of the studies (21 of 53) highlighted the benefits of allowing students to re-watch their skill videos, including improvements to the students' communication skills, competence, confidence, self-awareness and skill satisfaction (Doughty & Stevens, 2002; Economides & Nikolaou, 2008; Fisher-Stitt, 1996; Hawkins, Osborne, Schofield, Pournaras, & Chester, 2012; Huddy, 2017; Jeong, 2017; Kneebone et al., 2002; Li, Zhou, & Teo, 2017; Maloney, Paynter, Storr, & Morgan, 2013; McIntosh et al., 2018; Parrish, 2008; F. Paul, 2010; S. Paul, Dawson, Lanphear, & Cheema, 1998; Smallheer, Stone, Hicks, & Galbreath, 2017; Tomczak, 2011; Vaughn et al., 2016; White, Ross, & Gruppen, 2009; Winters, Hauck, Riggs, Clawson, & Collins, 2003 ; Zhou & Li, 2018; Zick, Granieri, & Makoul, 2007).

Skill Improvement/Enjoyment/Satisfaction

The watching and re-watching of expert videos provided benchmark models that students analyzed and learned from (Fisher-Stitt, 1996; Huddy, 2017; Z. Li et al., 2017; Tomczak, 2011; Zhou & Li, 2018). McIntosh et al. (2018) evaluated midwifery students (n=38) who had video recorded practical skills (simulations) and reported that the majority of participants (76%, n=38) found them useful and appreciated the experience of re-watching their own videos to improve the skills applied therein. Similarly, Maloney et al. (2013) used a randomised controlled trial with physiotherapy students (n=60) to test their communication and assessment skill confidence and competence and reported increased skill competence after re-watching their videos (p=0.005). Vaughn et al. (2016) surveyed medical students (n=24) who video recorded suturing and knot tying skills, and these students reported an increase in their skill-related self-confidence (p=0.005) after viewing their videos. When nursing students were learning catheterization skills (Chang & Park, 2017; Shen, 2014; Yoo et al., 2009) and when physiotherapy students were learning physical assessment skills (Seif, Brown, & Annan-Coultas, 2013), students were more satisfied with their learning experiences when they were able to re-watch their video performance at their own preferred time/place. Shen (2014) examined the catheterization and communication skills performance of nursing students (n=139) and reported a statistically significant improvement (p<0.001) when students were allowed to re-watch their own practice-based skills video (when compared to a control group that did not use video).

McIntosh et al. (2018, p. 56) reported one student participant as saying, "I have many opportunities to look at what I was doing and perfected the skills when I see myself." According to Zhou and Li (2018), the use of video provided assistance to ESL students, who could repeatedly watch and review content. Vnuk, Owen and Plummer (2006) conducted a pre/post quasi-experiment with first year medical students (n=95) who were learning a basic life support skill (based on International Liaison Committee on Resuscitation guidelines) and concluded that, because students were given only one opportunity to re-watch their video, their grading scale for assessing BLS performance did not improve significantly.

The factor of location in watching and re-watching skills videos was observed across many studies. Maloney et al. (2013) observed that the lab logistics (e.g, crowding, poor acoustics) can make it difficult for students to hear in the lab, and, when video equipment was provided, students preferred to record and re-watch their skills video at home. Further, Jeong (2017) found, when investigating nursing students' intramuscular injection skill acquisition, that the majority of students (77%, n=39) preferred to record their injection skill videos at their home. Similarly, McIntosh et al. (2018, p. 57) reported a majority of students (77%, n=39) agreed with the statement, "it has been helpful to be able to complete this assessment in the area where I live." Vaughn et al. (2016, p. 359) found that the majority of their participants (65%) also strongly agreed with the statement "...the home-video curriculum was highly educational." In dance and engineering, Tossell, Kortum, Shepard, Rahmati and Zhong (2015) and Jacob and Isaac (2008) anecdotally reported students' satisfaction when re-watching skills videos beyond the physical and temporal constraints of the traditional classroom, with respect to learning dance and engineering skills. Economides and Nikolaou (2008) and Sarrab (2015) highlighted the convenience smartphone videos provided students in documenting, re-watching and critically evaluating their practical skills performances after class, at any time/place suitable to the student.

Particular Benefits for Struggling Students

The re-watching of one's skills video was identified as being of particular benefit for students who are struggling and/or not meeting performance expectations. For example, White et al. (2009) performed a pre/post quasi-experimental design to compare remediation methods of medical students (n=57) who failed in the Observed Subjective Clinical Exam (OSCE) to demonstrate assessment skills (e.g., abdominal pain, diabetes, and/or pediatrics assessment skills). They found that when students were allowed to re-watch their failed OSCE skill video performance and then compare their performance to a model video performance using the assessment rubric, students were better able to recognize their errors and succeed in the subsequent skill performance when compared to only watching a model video. This exercise was paired with a written reflection on self-identified errors. White et al. concluded that allowing failing students to re-watch their video skills significantly (p=0.05) and improved medical students mean OSCE scores. Myung et al. (2010) examined video-based remediation (e.g., allowing students who failed to not only re-watch their failed video and to identify errors, but also to re-record an improved version of the assessment) and found this approach to be beneficial. Myung et al. used a qualitative design to evaluate 3rd year medical students' communication skills when performing physical exams by videotaping with a lab camera (n=499) and reported approximately a third of students (34%) who re-watched and re-made their practice-based skills video were more satisfied with the remediation process than those who were not allowed to re-watch and re-make their video. When the skill was perceived by students as difficult, students were more motivated to record and re-record as opposed to performing the skill face to face with the instructor watching (Jeong, 2017; Kneebone et al., 2002).

Particular Benefits for Saving time

In a traditional dance studio course, some learners may need additional time with complex sequences being taught, especially when working on technical features of movement and dance performance (Fisher-Stitt, 1996). Li et al. (2017) found that when teachers would post model videos of skills lessons online prior to class (particularly in large size classes), students had more time to watch and re-watch the skills at a time more convenient for them and/or location more conducive to learning the modelled skill.

Theme 2: Video as a Dynamic Tool for Feedback

Of all the relevant studies (n=53), about two-thirds (33 of 53) highlighted that the use of student-created skills videos was the basis for instructor feedback, and that instructor annotation and feedback led to positive learning outcomes for the students. Some studies considered "feedback vs no feedback", whereas other studies compared different forms of feedback. Diverse forms of feedback were captured in these studies, such as the use of checklists and other written annotations, as well as added instructor voiceover (recorded) feedback. In some cases, additional feedback was provided via the artefact employed during the skills video (e.g, such as a manikin, in the case of nursing, capable of providing real-time digital feedback for practical skills like CPR).

The source of the voiceover feedback included instructor-based, peer-based, and self-based feedback (the students'

own self-assessment of their own skills video in narrative form) (Naik et al. 2018; Sainsbury et al., 2017), the feedback provided by student peers feedback (Dunbar, Seery, & Gordon, 2006; Kneebone et al., 2002; McIntosh et al., 2018; Smallheer et al., 2017).

Feedback via Verbal Annotation

We use the term *verbal annotation* to refer to any sort of spoken material that is added to or attached to a student skills video, most often by the instructor in the form of a spoken 'voice over' which provides a running commentary by the instructor as they view the student skills video. For example, Naik et al. (2018) investigated this mode of feedback in a study that compared the impact of feedback vs nofeedback for surgical trainees' suturing skills videos (n=56). The feedback group had a higher score rate in the completion than the no-feedback group (82% vs 30%, $p<0.0001$). Further, Nail et al. highlighted that the use of instructor-recorded feedback was an advantage, particularly in large classes where professors were not always available for students who were unable to attend classes. However, McIntosh at al. (2018) compared the skills of 3rd year medical students (n=68) who received real-time faculty feedback with those who receive delayed feedback when performing direct laryngoscopy (DL) and tracheal intubation skills. Authors reported a significant difference ($p=0.05$) in the mean time for intubation and concluded that real-time (synchronized; not recorded) faculty feedback allowed students to achieve higher success rates compared to delayed (asynchronized recorded feedback.) However, we signal that under certain conditions (online learning, large class sizes, and so on) real-time face-to-face feedback is not always tenable.

Digital or Mechanical Feedback via Task-Trainer Artefacts

In certain domains of skills learning, students employ a simulation artefact or prop. For instance, in nursing, the learning of Basic Life Support is often performed using a manikin. The manikin itself may be equipped with instruments that can capture, record, and then subsequently report out attributes of the student interaction relevant to the skill (e.g., measuring the extent of chest compressions and ventilation volume or the degree to which palpation was performed properly). Other domains of skills learning make use of "task trainers", models of body parts or of physical systems that allow students to practice and learn procedures. In some cases, the artefact itself can be a source of data, and when the task trainer's sensor data is aligned and appended to the student's skills video, this provides another source of information and feedback. Several studies in our dataset of relevant studies drew on this particular form of feedback. For instance, Vnuk et al. (2006) study investigated student-created skills videos in the context of learning of Basic Life Support using a manikin (which measured the extent of chest compressions, ventilation volume, and whether palpation was performed correctly). The students' skill performance with the manikin was video recorded and instructors provided feedback immediately after viewing the video, via face-to-face interaction. Students also received feedback from the manikin's own sensors (e.g., correct palpation readings). The study found that the combination of instructor feedback on students' videos and the feedback from the manikin was instrumental in affording the students with the ability to identify their own errors and to understand the results of their own actions and skills performance (e.g., the reason for failure or areas that needed improvement) (Vnuk et al., 2006).

Feedback via Text Annotation (By Instructor or Peers)

We use the term 'text annotation' to refer to any sort of text-based material that is added to or attached to a student-created skills video, most often by the instructor but also potentially by peers or even the students themselves. Several studies in our identified set (8 of 53) investigated this mode for feedback provision.

By Instructor

The dominant form of text-based feedback is based on the use of rubrics and checklists (e.g., KABONE; Global Score rating) of core competencies and assessment criteria (DeBourgh & Prion, 2017; Jeong, 2017; Myung et al., 2010; Smallheer et al., 2017; Srinivasan, Hauer, Der-Martirosian, Wilkes, & Gesundheit, 2007; Yoo et al., 2009; Yoo et al. 2010). Hawkins et al. (2012) reported that the use of a practical skills checklist had a significant positive correlation ($r=0.83$; $p < 0.0001$) with student success in performing the skill as compared to students' skill video performance without checklist (Hawkins et al., 2012). Vnuk et al., (2006) (nursing) and Tomczak (2011) (dance) found many students could identify where or why the expert examiner had failed them because instructor and student reviewed the video together. In this study, the video was annotated with instructor feedback.

Feedback Comparisons

Several other studies compared the impacts of different types of feedback, such as feedback from instructors that is text-based as opposed to video-based instructor annotation and feedback (e.g. using voiceover; using digital markup software to add written comments to student-created videos), finding that the latter highlighted social, personalized presence and cultivated better relationships with students, even in large classes (Henderson & Phillips, 2015; Istanbullu, 2008; Jacob & Issac, 2008; Seckman, 2018).

Instructor vs Other Feedback Providers

Several studies (18 of 53) investigated the impact of the source of the feedback, whether from instructors, from other students (peers), or from the student themselves critically commenting on their own skills videos. Studies by Hecimovich, Maire and Losco (2010), Vaughn et al. (2016), and Lepczyk (2009) investigated peer vs instructor feedback on students' skills video. Some studies showed that these modes did not differ statistically in scoring students appropriate skill performance (Hecimovich et al., 2010; Vaughn et al., 2016). Winters et al. (2003) allowed students to select a peer to record a video skill together and provide each other feedback, and noted that when students selected a peer with similar abilities, these pairs tend to make similar errors, reducing the value of peer evaluation. Winters et al. concluded that faculty feedback is still paramount to nursing students' skill performance learning and rotating peer partners or matching peers with different abilities is efficacious. Other studies did uncover differences between the feedback provided by different sources. For instance, feedback was found to differ by source in terms of the focus of the content of the feedback: for example, instructors focused both on technical and communication skills in practical simulations or skills assessments, and peers focused more on providing feedback on technical skills (Grant, Moss, Epps, & Watts, 2010; Vaughn et al., 2016; White et al., 2009).

Feedback via Side-by-Side Comparison

Another mode of feedback can be created via the activity in which a student views their own skills video alongside the skills videos of other students. The comparison itself becomes a source of information that a student can harness as a form of feedback. Some studies established the benefits of this particular mode of feedback. Self-reflection is supported by the instructor, by articulating expectations, check-lists, or success criteria for a skills video. Maloney et al. (2013) found that the majority of students agreed or strongly agreed with the statement that "comparing their own video with a video created by their peers [was] very helpful". Some authors described how students played their skills videos for one another and were able to better compare their skills performance in relation to the faculty skill benchmarks (Kneebone et al., 2002; Srinivasan et al., 2007). Srinivasan et al. (2007) demonstrated that low-performing students significantly improved on their performance when they were able to watch video recordings of their own performance alongside their peers, particularly when performance success criteria were outlined by faculty (r=0.26-0.47; n=171). Other research revealed that self and peer feedback were important in improving collaboration skills and building a learning community (Doughty & Stevens, 2002; Kneebone et al., 2002; Z. Li et al., 2017; Maloney et al., 2013; McIntosh et al., 2018; Wake, 2018).

Peer Feedback

A variant of this peer feedback mode (students watching on the skills videos of peers) is created when students not only watch the skills videos of other students, but also provide critical feedback on peer videos. The peer feedback is then made available to the original video creators. Several studies in this scoping review (11 of 53) investigated this mode of feedback. Smallheer et al. (2017) reported that the majority of the students who received peer-to-peer feedback through the video-recording of skills sessions better recognized areas in which skill improvement was needed. Similarly, McIntosh et al. (2018) found that the majority of students reported that the experience of peer-to-peer video-recorded sessions decreased stress and helped them focus on doing a thorough assessment together, rather than being anxious while performing the assessment skills in front of instructors or faculty. Kneebone et al. (2002), in a qualitative study of medical students learning catheterization in large groups, reported an increase in students' course satisfaction when peer feedback was encouraged. In this study, the recorded faculty feedback on the collaborative skills videos (video works created by students in groups) enhanced peer relationships and peer-feedback fostered the growth of learning communities. Dunbar et al. (2006) reported how applying the *Conceiving, Designing, Implementing, and Operating* (CDIO) framework for teaching engineering psychomotor skill produced positive attitudes, high levels of motivation towards practical work, and a sense of pride amongst students (in outcome-based assessment tasks using video documentation tools and peer feedback). McIntosh et al. (2018, p. 57) reported that peer video feedback alleviated general social anxieties and/or feelings of loneliness. Paul (2010) and Winters et al. (2003) both articulated the point that because faculty are not always available for immediate feedback, peer feedback encourages self-directed learning and saves faculty time and resources.

More generally, studies demonstrated how peer feedback on students' video improved collaboration, saved time for faculty, and alleviated anxieties about being observed when practicing a new skill or performing a complex task (Anderson, 2012; DeBourgh & Prion, 2017; Economides & Nikolaou, 2008; Huddy, 2017; Kneebone et al., 2002; McIntosh et al., 2018; Myung et al., 2010; Nilsen & Baerheim, 2005; F. Paul, 2010; Sarrab, 2015; Smallheer et al., 2017; Winter et al. 2003).

However, some authors (5 of 53) highlighted challenges that occurred when peer or self feedback was the sole assessment (Dania, Hatziharistos, Koutsouba, & Tyrovola, 2011; Hammoud, Morgan, Edwards, Lyon, & White, 2012; Hecimovich et al., 2010; Zick et al., 2007). Economides and Nikolaou (2008) and Tossell et al. (2015) reported that when faculty do not clearly articulate expectations or success criteria for a skills video project for peer or self assessment, the value of the skills video pedagogy is attenuated. Signalling other possible challenges, in Nilsen and Baerheim, (2005) one student reported that they felt "embarrassment at watching themselves on videotape together with fellow students" (p. 3) while another student stated, "...to imagine making a video of your own failures is frightening" (p. 3).

Theme 3: Sociotechnical Issues

Of all the identified studies (n=53), about 50% (n=27) highlighted issues that we have broadly grouped under the umbrella term of sociotechnical issues. This includes accessibility and usability challenges with video and video supportive technologies (dealing with video files, video quality), as well as the ethical considerations of video making and sharing.

Almost half of the studies (23 of 53) highlighted technological issues when using video-based pedagogies, including issues with: uploading and storing large video files; low resolution, small screen size, and limited processing power (e.g. [Economides & Nikolaou, 2008; Istanbullu, 2008; Leijen, Admiraal, Wildschut, & Robert-Jan Simons, 2008]). Most of the relevant studies in the engineering domain highlighted these and other technological issues (Economides & Nikolaou, 2008; Istanbullu, 2008). Many studies in the nursing and dance domain also briefly described the technical support provided to students and instructors, such as a contact number to call for support, peer support, or searching online for tutorials and DIY solutions (Cherry, Fournier, & Stevens, 2003; Risner, 2009).

The issue of instructor satisfaction with technical infrastructure was highlighted. For instance, Istanbullu (2008) found that some instructors were dissatisfied with the mobile learning infrastructure, which, in some cases, either did not support skills videos very well or at all (e.g., due to the large data requirements for video sharing). However, it is reasonable to expect that infrastructural support (including resources for hosting video content) have improved dramatically in the time since this study's publication. McIntosh et al. (2018) noted the value of involving Information Technology support earlier for both students and faculty. Maloney et al. (2013) described that, while ongoing IT support was provided to physiotherapy students, 34% of students reported experiencing some technological difficulty at some point.

All of the reviewed research studies briefly stated that informed consent was obtained before recording videos. However, no information was provided regarding details of informed consent procedures or ethical 'best practices' (e.g. the terms of consent for recorded human subject, who will see the video, where and how videos will be stored/shared, the deletion of recorded video artefacts, use of face-blurring technology, and so on). Most studies

did not discuss copyright, ethics or privacy concerns when using video technology for documenting skills assessments. Studies described how faculties used video software; however, they did not discuss with students how to address issues relating to privacy or anonymity when data is being (publicly) recorded and shared. For instance Morgan (2015) highlighted the risk of the internet (including video technology) in exposing dancers to public scrutiny.

In addition, Mabingo (2015) discussed the exclusion of certain cultural groups when instructors (from dominant cultural groups) create their own skills videos as model videos to emulate. White et al. (2009) asserted the value of maintaining privacy and confidentiality when students fail in their skills video performance. When Huddy (2017) asked students to record their dance performances and upload the footage to cloud-based storage (e.g., Google Drive, WIX or Tumblr sites), there was no discussion about privacy or safe data storage. Li et al. (2017) and Huddy briefly recognized the possibility of cyberbullying through the use of free media platforms compared to apps or infrastructure with better security, and with the latter having the negative effect of creating technological firewalls and hierarchies resulting in the teacher being perceived as a media "gatekeeper".

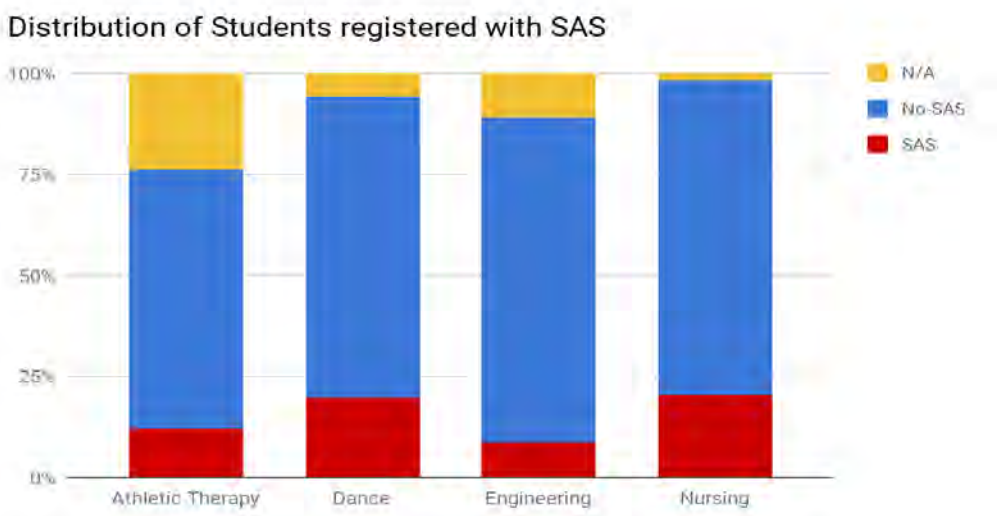

Figure 2. Distribution of student responses as per their registration with SAS (student accessibility services) in percentages.

Phase 6: Convergence with Consensus: Stakeholder Engagement Study

The sixth and final phase of the scoping review methodology is the use of a research survey to establish consensus (or dissensus) with experts across these salient questions and themes identified in the previous sections (Arksey & O'Malley, 2005). Based on these themes, we conducted a survey across four different disciplines that teach practical skills, arts, and situated performance-based competences: athletic therapy, dance, engineering, and nursing.

Table 1. Distribution of Students and Faculty Participants.

Discipline	No. of Students (Gender)	Age Range	No, of Faculty (Gender)	Age Range
Athletic Therapy	25 (14 F, 11 M)	20-35	4 (3 F, 1 M)	41-60
Dance	51 (49 F, 2 M)	17-25	6 (6 F)	36-65
Engineering	93 (13 F, 77 M, 3 T)	17-30	5 (5 M)	41-65
Nursing	108 (96 F, 12 M)	20-55	19 (16 F, 3 M)	31-60

Participants in the survey

The literature reviewed above shed little light on the demographics of participants, so we sought to better characterize the participants in our survey. Our survey sample included students (n=277) and faculty (n=34) across the four disciplines (see Table 1).

Of the total sample, 16% of students identified as being registered with the student accessibility services (SAS) which provides academic accommodation and related supports to students with any sort of disability (8% of students selected "N/A" as a response to that question, See Figure 2). Furthermore, of each discipline that had students registered with SAS, dance (20%) and nursing (20%) were the two disciplines with the highest proportion of students (as seen in Figure 2). Of those registered with SAS, the majority of these students were female (74%) and between the ages of 20-25 (46%).

Academically speaking, most of the student participants were high achieving who reported their GPA as B+ (39%) and enrolled in their 2nd year (30%).

METHOD

Using a questionnaire consisting of both closed- and open-ended questions, we asked study participants demographic questions including age group and gender. Students were more specifically asked about their academic status (year, program, GPA, and whether or not they were registered with the student accessibilities services), while faculty were asked about their status and the courses/programs they teach. In the present article, we report on the results of the open-ended survey questions where participants were asked to identify the opportunities and challenges of teaching and/or learning practice-based skills using video documentation tools.

ANALYSIS AND RESULTS

The open-ended responses were coded by breaking survey data down and identifying specific references (e.g., keywords, phrases, sentences) in relation to both established and emergent themes. Using an iterative deductive approach, we then examined if and how the coded survey data confirmed, challenged, or qualified/enriched the three themes we identified in extant literature and research (1. creating and (re)watching; 2. feedback and 3. socio-technical concerns) (Miles, Huberman, & Saldana, 2013).

When we clustered the survey responses, the three key themes we identified in our literature review once again emerged as dominant themes and, indeed, the majority of participants (including SAS students) identified and welcomed opportunities for creating and (re)watching skills videos as and for learning, as well as the opportunities for video as dynamic tool for feedback.

In other words, deploying video tools and software to create and re-watch their skills video was perceived as beneficial for learning, as was the use of video software tools for peer feed-

back and instructor assessment. While sociotechnical matters focusing on technical issues, questions of access, and privacy and data security were generally limited, emergent themes in the data nevertheless highlighted important questions about the use of video tools as and for learning. Here, our findings signalled ethical concerns absent in the literature, particularly with regard to issues of privacy, anonymity, and data security in contemporary digital and networked contexts. We signal these emergent themes below as important areas for further research and policy considerations, particularly with regard to SAS students and using video in the burgeoning world of online learning. The following are representative examples of participants perspectives that illustrate and/or qualify the three themes.

Re-watching skills video as/for learning

The theme of (re)watching skills videos as/for learning was dominant across students, faculty and disciplines. One SAS dance student said:

> In class [recording]really helps to improve and see what parts of the body to alter in order to improve.

Similarly, an athletic therapy faculty explained that when students record faculty skill performance *"students seem to do better on the practical exam."* These responses show the current emphasis that both students and faculty have on re-watching the videos they created and how that leads to students' improvement on skill performance evaluations.

In addition, a number of students (31%) and faculty (21%) reported that one challenge they face with regard to learning/teaching skills often revolves around not having enough in-class time for skills learning, application, and practice. Here, students and faculty expressed the potential they see in using video recording of themselves to help improve their learning. As one nursing student reported:

> I could see how viewing myself perform a skill would allow for fine tuning and adjustment of technique.

These examples, and similar responses in our data, indicate strong motivation from faculty and students to pursue new methods for teaching/learning skills using video in both face-to-face and online learning contexts.

Video as a tool for dynamic feedback and formative assessment

"Not enough one on one," is how one SAS dance student summed it up for many students in large classes. The idea that video recordings can be used as a tool for individualised feedback was the second most frequent theme mentioned by participants. Female students highlighted feedback opportunities more often (28%) compared to the number of times male students did (15%) across all disciplines. Emblematically, a female non-SAS nursing student explained that:

> By recording my skill on a mannequin and getting feedback from faculty/peers, I am able to get constructive feedback.

Similarly, a member of the nursing faculty stated:

> If the video is used for a feedback session with one-to-one support from faculty, it could be a useful tool.

While students and faculty ascertained that faculty feedback on a practical skills assessment is important, peer feedback was mentioned to allow for *"more opportunities for students to help other students"* (engineering student) and to provide *"suggestions for improvement"* (engineering faculty).

Sociotechnical Issues and Emergent Concerns

While a limited number of participants discussed the challenges of access, ethics and privacy when using smartphone video to teach and learn a skill, our survey findings qualified our third theme, and signalled emergent concerns seldom noted in the literature. For example, a nursing student described the use of video as and for learning as more stressful because:

> "I feel uncomfortable in front of a camera."

Similarly, one dance faculty member indicated that students may feel awkward in front of a camera, and if video-based pedagogies are improperly mobilized, they might actually hinder learning:

> I do worry that it may cause stress and lower motivation in the early stages of their learning… I think my concern lies within the precarious body image so many dancers face during intensive training, and I think this may compound this issue and therefore the context, age and stage of student(s) would be crucial.

These responses indicate that using video recording in learning environments must be undertaken strategically and critically, with accommodations or video techniques (face-blurring tools, editing, etc.) for students who may find video documentation and sharing problematic, particularly in dance or athletic therapy.

About 28% of SAS student responses addressed sociotechnical issues when compared to only 15% of non SAS students. This difference in responses could be due to SAS students' understanding that video recording is a permitted accommodation in the classroom. Here, one SAS nursing student suggested that video recording should be used pedagogically only *"after taking consent"*. In a different vein, one engineering faculty reported:

> I might be concerned about the equity of the approach [video recording] for students with accommodations (visual impairment, psychomotor skill impairment, if [video recording] is not critical to achieving course learning outcomes, ...).

Again, our survey qualifies the existing literature by signalling that a critical approach to video-making technology is needed, one that accounts for the sociotechnical complexity of using video making tools, including diverse and flexible forms of accommodation.

Only 3 of 277 student survey respondents mentioned accessibility issues related to safety when using video recordings in the classroom. One SAS engineering student stated:

> One of my courses requires us to film our prototypes. In other scenarios, such as machining, it is unsafe to be using a phone for any reason during this process.

On the other hand, one SAS nursing student describes the cell phone restrictions in her lab:

> I have used my smartphone to record a class assignment but normally cell phones are not allowed in the lab. If professors made assignments that incorporated our smartphones and video resources it would be beneficial. Especially since healthcare is advancing and smartphone use is on the rise, nursing students need to feel comfortable utilizing their smartphones and recording themselves, but patient safety and privacy is more important.

While faculty did not mention safety or privacy issues concerning video recording in or outside the classroom, the comments

above highlight critical issues relating to ethics, accommodation, and safety when mobilizing video tools for practical learning in both face-to-face and online learning contexts.

DISCUSSION

Through our survey, we were able to verify the three themes found in our literature review, which included (a) the value of creating and (re)watching practical skills videos (b) the use of varied modes of feedback and (c) the need for both technical knowledge as well as, further, the importance of understanding ethics "best practices" and privacy guidelines. While most health students value face-to-face faculty feedback, they recognized the temporal and spatial constraints that limit traditional feedback, and students and faculty also recognized the flexibility of video recording beyond physical classroom walls, particularly in online/blended learning settings. Students can analyze and critically reflect upon their own skills videos and also invite peers to provide feedback on the video. Such pedagogical innovations might benefit faculty as well, by decreasing feedback workload, supporting time management and efficiency, and building collaborative communities of practice in and outside of the classroom. Furthermore, providing students the opportunity to record and receive feedback on video-based practical skills might contribute to a decrease in students' performance anxiety (when instructions are clear and consistent and guidelines provided). Although our scoping review findings point to positive outcomes when using video-making to teach and learn practical skills, information regarding the ethics of data safety and privacy and participants demographics were not adequately addressed in the existing literature. Simultaneously, Canadians are becoming increasingly aware of privacy risks, 'digital citizenship', and cyberbullying, and are in turn concerned about the ethics of video making and sharing (Government of Canada, 2016).

In our survey we found that students who identify with a disability spoke more about the ethics and safety of using video to record skills. Some students expressed discomfort about performing skills in front of others, and our scoping review also showed that some first-year students feel uncomfortable watching themselves on video. Additionally, students who share their videos with others might experience increased stress and feelings of shyness, especially if they are not feeling confident about their academic standing in a course. Doughty and Stevens (2002) and Smith-Autard (2003) recommended preparing students for video self-viewing and peer-viewing by guiding them with assessment criteria. We also found that some students experienced increased stress when they needed to rely on others to complete their skills video assessments, or when using smartphone video with no guidelines and faculty support.

A number of limitations were identified in the scoping review methodology. First, while we tried to include diverse disciplines, there is a possibility that our review may have missed relevant studies. This limitation can be attributed to database selection (i.e., searching other databases may have identified additional relevant studies), exclusion of the gray literature from the search, or the exclusion of studies published in a language other than English. Second, the self-report survey and the coding of the literature by the same researchers might introduce a bias.

In summary, our scoping review suggested that we need to orient the development of our own pedagogical resource around more critical design principles (Hamraie, 2017), including flexible accommodation and meaningful forms of inclusion that account for the voices and inputs of students with unique needs (Thumlert & Nolan, in press; Thumlert, de Castell, & Jenson, 2017). Issues of privacy, data security, and the usage of skills videos are increasingly germane. However, there was little reference to these critical concerns in the dataset of relevant studies. For instance, when students upload their skills videos, what provisions are in place to govern the subsequent use of those videos over the duration of the course and beyond, once the course is completed? To what extent, if any, can actors (such as the instructor, other instructors within an institution, administrators, researchers, or general audiences *etc.*) consume or otherwise make use of these skills videos? Ultimately, while our survey confirmed several findings from our literature review, we suggest that there is a critical gap in the existing research with regard to supporting students and faculty with understanding critical concerns relating to ethics, informed consent, privacy, and data security in areas of video production and sharing.

CONCLUSION

Our six-step scoping review has revealed that using smartphones and video tools to teach, learn, and document practice-based skills has several advantages ranging from accommodating students with unique needs to activating new pedagogies supportive of deeper learning and more flexible assessment and feedback practices. However, support for video ethics, data-security and privacy "best practices" was identified as a gap in existing literature, as well as a critical dimension of video-based pedagogies today.

Our literature and scoping review now enable us to go forward in creating an online resource to explore and articulate the affordances of smartphone video making to enhance learning in blended and online (and also face-to-face) contexts where teaching complex performance and practice-based skills are central to course aims.

As noted in our review, studies demonstrate that when students record themselves performing a practical skill or situated/simulated performance and receive (video-based) feedback, there is an increase in students' feeling of engagement and belonging in a community of learners, as well as increased confidence and mastery of the practice-based skill. To support and enrich practical and embodied skills learning, and to accommodate diverse learners, we are now in the process of developing SmART (Smartphone Accommodation Resource Toolbox), a cross-disciplinary online platform designed to drive pedagogical innovation through the use of smartphone video production and the use of dynamic interactive feedback tools. Drawing upon our findings, and salient gaps in the literature, our resource toolbox will ensure that ethics, privacy and data-security (including the use of consent/release forms and face-blurring technology), will be integral to every aspect and phase of video production and sharing. Further, practical skills teaching and clinical based situated learning are needed for supporting inclusion, accessibility, and accommodation in performance and practice-based educational settings.

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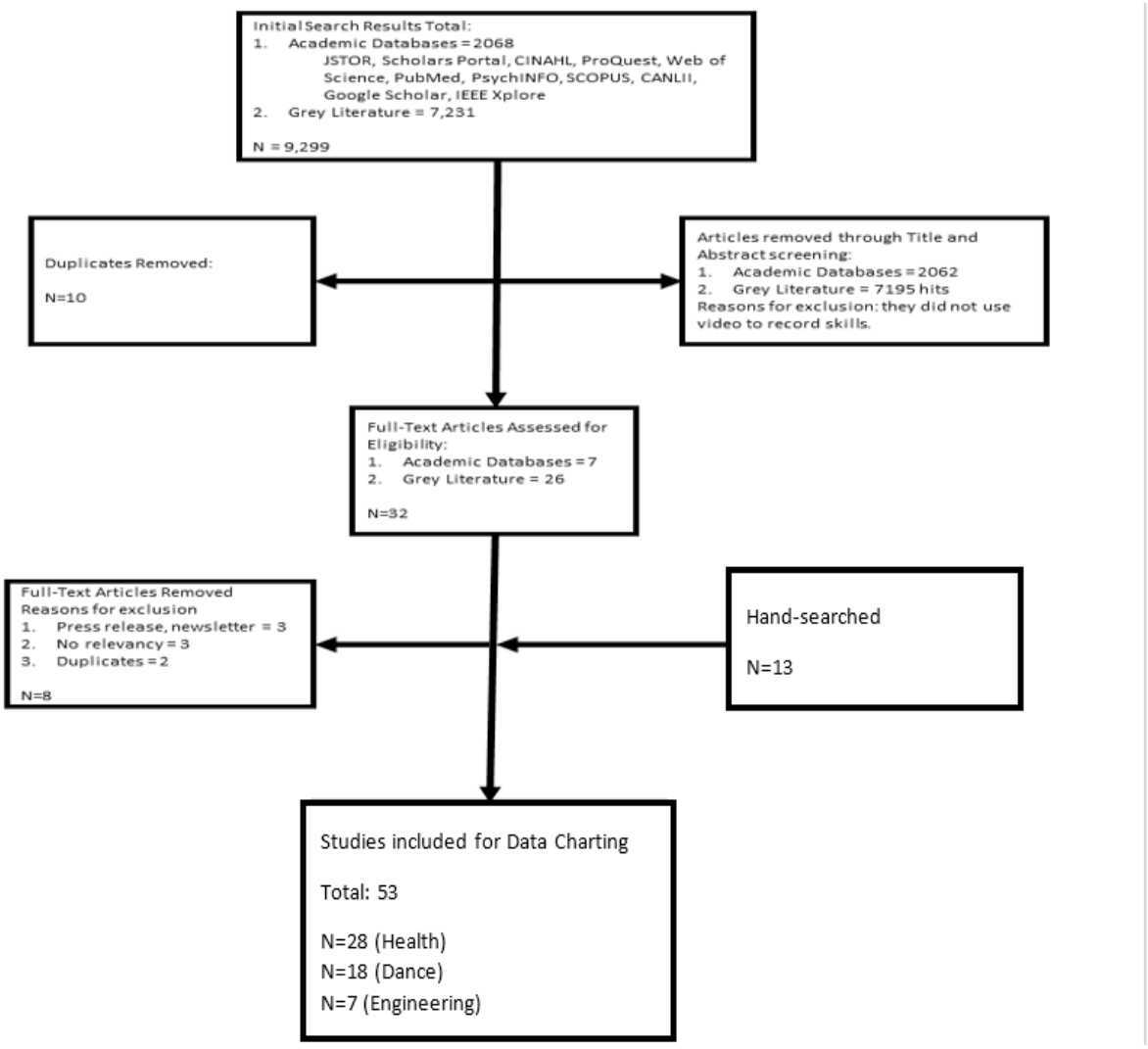
APPENDIX A : SCOPING REVIEW PRISMA DIAGRAM



APPENDIX B: SUMMARY TABLE OF STUDIES

Article Metadata **1. Author/s** **2. Country**	**Research Methodology** **1. Purpose/Design** **2. Sample Selection, size** **A. Data Collection and Analysis** **3. Theory**	**Study Analysis and Findings** **1. Outcomes/Results** **2. Ethical considerations** **3. Recommendations**
1. DeBourgh, Prion (2017) 2. USA	1. Mixed method design; Compare the instructional methods (video recording vs. in-person examinations) for nursing student practice. 2. BScN (n=102) of BScN nursing enrolled (n=17 male, n=85 female). A. Likert-type scale and narrative fill-in presence surveys; SPSS v 22.0 was used. 3. Deliberate practice; focused on performance improvement as most important factor in developing expertise.	1. Increase (>) in confidence levels after submitting (n=56; 55.4% felt very confident) vs. before creating the video (n=9; 8.8%); feeling very confident after submitting third recording (n=73; 73.7%) • Students were "somewhat satisfied" with the video validation method vs. evaluation with a live observer (1.93; SD 1.15) • Passing rates: 1st vid 93.1% (7 failure), 2nd vid 98% (4 failures) and 3rd vid 95% (5 failures). • Challenge in scheduling, conflict among team members, noise in recording environment, feedback delay • Students felt more confident performing new skills after SDVV process. 2. Researchers that reviewed the surveys were not the instructors in the course.
2. Doughty and Stevens (2002) 2. UK	1. Examines how students of dance, drama/theatre and performance may learn more from their practice through video reflection. 3. John Dewey's experiential and experimental education philosophy.	1. Independent learning and communication skills developed from self-viewing and reflective dialogue b/w students and tutors- student-centred development through collaborative learning using self and peer-to-peer critical reflection, feedback, and assessment of video. • Self-viewing responses including shock and embarrassment. 3. They recommend preparing students for the experience of self-viewing.
3. Doughty et al. (2008) 2. UK	1. Qualitative design; Focused on enhancing students' peer learning and develop autonomous critical observation. Techniques of reflection and documented changes in practice using digital video and photography. 2. Second and third-year undergraduate dance students (n=175). 3. The projects were developing theories of reflective practice.	1. Digital video as pedagogical intervention in learning/teaching a wide range of dance skills and show how student-centred learning in dance is enhanced by technology. Student-centred development through collaborative learning using self and peer-to-peer critical reflection, feedback, and assessment of video. 3. Video also helped learners address and change habitual behavior.
4. Dunbar et al. (2006) 2. Ireland	1. Educating engineering and technology teachers for the Irish second level system and implementing Conceiving, Designing, Implementing, and Operating (CDIO) philosophy. 2. First year students (n=136). A. Empirical research with statistical analysis (including a questionnaire) as well as qualitative analysis of affective CDIO learning and intrinsic motivation to learn. 3. The authors take a CDIO and constructivist approach to teaching engineering cognitive and psychomotor skills.	1. CDIO outcome-based assessment tasks in engineering produced positive attitudes, high levels of motivation towards practical work, and a sense of pride and satisfaction • Found a preference for a specific category of learning styles amongst, predominantly male, engineering students: Active, Sensing, Visual, and Sequential; consistent internationally amongst engineering students. • Teacher assessment mechanisms include writing assignments, an exam, and a design task and lab-based project work; students were asked to perform a psychomotor skill and were quizzed in relation to the practical content knowledge surrounding the skill.
5. Economides and Nikolaou (2008) 2. Greece	1. The authors present a framework for evaluating handheld devices in relation to mobile learning (m-learning). 2. The authors evaluate based on usability, technical aspects, and function.	1. Mobile devices (m-devices) needed certain characteristics to be effective educational tools: (1) Usability (including user interface, presentation and media, navigation, physical); (2) Technical (including performance, sensory systems, compatibility, security, availability and reliability);(3) Function (including communications, information and knowledge, organization and management, entertainment and amusement). - m-learning with a web-enabled smartphone, enables students the flexibility to solve problems in real-time - no longer need to wait until they are at their computer; m-learning is collaborative and interactive. 2. Economides and Nikolaou (2008) also mention distraction as a possible issue with m-learning.

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6. Fisher-Stitt (1996) 2. US/Ca	1. Mixed method design; Experimental study involving the development and testing of interactive multimedia computer learning resource for ballet. 2. First year dance major technique class (n=40); from statistical analysis, interviews, short answer responses to survey questions 3. Concept of multiple kinds of intelligence (linguistic, logical-mathematical, bodily-kinesthetic, spatial, and musical); John Dewey's experiential and experimental education philosophy.	1. Computer-assisted instruction has valuable and valid role in dance studio instruction by reducing time, accommodating to learning, and digital technology usage • Themes found: (1) extend time and space, (2) learning flexibility (learners control); clear expectations. 3. Relevance of technology in dance society reaffirmed as forefront for innovation.
7. Grant, Moss, Epps, & Watts (2010) 2. USA	1. Quasi-experimental design; Determined effects of video review on individual performance. 2. Senior Nursing Students (n=34) + Senior Anesthetist Students (n=6); Control group (20; 17 Nursing, 3 Anesthetists), Experimental (20; 17 Nursing, 3 Anesthetists). A. Checklist (out of 31 or 32 depending on scenario) Interrater Reliability (kappa Coefficients .71 to .94. & agreement from 85%-97%) two way anova, 2-tailed t tests; Comparative analysis.	1. Intervention group more likely to perform three behaviours. a) Pt, identification ($p< 0.01$) b) Team communication ($p=0.013$) c) Assessment of vital signs (t test, $p=0.47$)
8. Hawkins et al., (2012) 2. UK	1. Examines the impact of video recording on the accuracy of student self-assessment of basic surgical skills in a UK setting, with a particular focus on the inclusion of defined standard benchmarks for junior trainees. 2. Final year medical students (n=31) on clinical attachment. A. The video-recorded performance were sent to 2 independent expert assessors using identical GRASs; GRS, GraphPad 2009.	1. Before viewing the video of their own performance, the mean student self-assessment GRS scores were lower than the mean of expert assessment GRS scores ($p=0.012$, paired t-test). After reviewing the first video, GRS scores remained significantly lower than expert assessment GRS scores ($p=0.011$). After the video review performance demonstration, 19 students (61%) increased their self-assessment GRS scores, 8 (26%) decreased their score and 4 (13%) unchanged. Student self- assessment GRS scores were no longer significantly differed from expert assessment scores ($p=0.272$, paired t-test) 2. Expert assessors were blind to student self-assessment scores, ethical approval was granted prior study.
9. Henderson & Phillips (2015) 2. Australia	1. Quantitative; "This article proposes an alternative in the form of individualised video recordings of the lecturer discussing each assignment" (P51). 2. Undergraduate students (n=49) and postgraduate students (n=77). A. The two lecturers used the same narrative structure in their video-based feedback (confirmed through an analysis of 10 videos produced by the lecturers). The structural elements, or parts of the narrative, are similar to what the lecturers normally included in their written feedback (based on an analysis of 20 assignments with text-based feedback by the lecturers).	1. n=51 unequivocally positive about the video-based feedback, • 67 (91%) agree to continue video-feedback; n=7 disagreed. • 5 strengths: (1) feedback was specific to individuals; (2) the feedback were supportive, caring and motivating; (3) affordances of the media; (4) video-based feedback resulted in reflecting on their task performance, process and thinking; (5)constructive feedback • (n=26, 21%) were initially anxious about playing the video; n=15 (12%) spent time finding examples. 3. Impact on learning, self efficacy beliefs and future task performance, includes measuring the feedback content; validating the usefulness of detail; implications of context, including class size, discipline, and assessment type.
10. Huddy (2017) 2. Australia	1. Qualitative; Explore the use of "digital technology within teaching and learning activities, to enhance student engagement with progressive assessment tasks" 2. Data has been collected in the form of tertiary dance students' digital repositories, oral presentations and surveys; tertiary dance teachers' reflective discussions; and the researchers' observations, field notes, and discussions and a review of existing literature. 3. Constructivist theory of learning influenced by "Gardner's Multiple Intelligences Theory, Inquiry Based Learning, Mezirow's Transformative Learning and Kolb's Experiential Learning Theory.	1. Found that m-devices extended teaching and learning beyond classroom limits of time and space – creating greater learning flexibility; peer feedback increased with video sharing and student progress; students found they relaxed, more open to peer feedback and it became productive • Effectiveness of video technology in the dance technique studio (including students' relationship to learning, skill acquisition, and reflection) through engagement with progressive assessment tasks. • Approaches: Receptivity, Replication and Respect; student engagement was high as a result, students uploaded, reviewed, reflected on, and deleted their footage regularly. • Empathetic peer learning and teaching changed the traditional hierarchical culture of the dance studio to a more open, less judgmental learning environment. 3. Security and privacy an issue with media platforms, and YouTube for video sharing.

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11. Istanbullu (2008) 2. Turkey	1. Implementation of a m-Learning Management System (Mobilim) for engineering educators designed for m-learning environments. 2. n=45 students and n=9 instructors; course development tools, communication, and assessment to the development of Mobilism.	1. Instructors and students evaluation of the system features reveals that Mobilim is a useful m-learning environment. 2. Technical issues with m-devices related to low resolution, small screen size, and limited processing power.
12. Jacob and Isaac (2008) 2. Hong Kong	1. Mixed method design; Analyze different forms of mobile computing devices in relevance for m-learning. 2. Analyze a survey done with university students on m-device usage for m-learning purposes and identify learning trends that may enhance learning. 3. M-learning and e-learning (learning facilitated and supported through the use of information and communications technology)	1. M-learning supports a digitally rich, interactive simulation experience for students. • Supported learning/teaching flexibility; portability of m-learning supports informal and situated (contextually aware) learning environments. 3. Cost as a barrier to learning; m-devices as a distraction from learning.
13. Jeong, H. (2017) Part A 2. South Korea	1. Quasi Experimental study with non-equivalent group pre-test and post-test; investigate the effects of the utilization of video recordings on nursing students' self-evaluation, fundamental nursing practice competency, self-efficacy and learning satisfaction in the fundamental nursing science practice. 2. Participants in 2nd year nursing students (n=76) Majority female, non-religion A.(i) Independent sample T-test; (ii) Paired Sample t-test for pre-test and post-test differences; (iii) ANCOVA 3. Repeated learning effects, Objective observation, Immediate feedback	1. Effects of fundamental nursing practices using a video found that (1) Protocol Competency: learners self evaluation within groups both > significantly b/w groups, but the experimental group scored significantly higher (p=0.002). With teacher evaluated within group showed no significant improvement but control group showed significant improvement b/w groups; (2) Self-efficacy:within groups showed significant > but b/w groups showed no significant differences; (3) Learning Satisfaction: experimental group felt more satisfied as "it facilitated students' self-directed learning…"; (4) "Smart Learning Evaluation: 92.3% indicated this was an appropriate or very appropriate intervention. 2. IRB, written informed consent, control group completed intervention. 3. Limitations on student time in the lab and resource; Student group feedback may be more efficient; Use of video benchmark.
14. Kneebone et al., (2002) 2.UK	1. Qualitative design; Explore the feasibility and benefits of using video for clinical skills and interpersonal communication. 2. n=51 undergraduate medical students performing both tasks (102 performances) over 10 months. A. Observation and group interview analysis.	1. Feasible, but time consuming (faculty) Perceived benefits from: (1) Students found simulation "realistic"; (2) Tutors: observing scenarios provided valuable insights into the learning process; and (3) Stimulated patients: All impressed by the students' professionalism and sensitivity Negative Responses: the amount of time spent waiting for their colleagues to finish watching their videotapes
15. Li, Zhou, & Teo (2017) 2. Canada	1. Mixed method design; Examine the effectiveness on Generation Z of technology integrated into dance education. 2. (n=60) Students (n=57 F; n=3 M); qualitative analysis of interviews, quantitative research (survey analysis), and a literature review of technology use in dance education were utilized. Two female high school teachers were individually interviewed.	1. Found: (1) students and teachers benefited from technology integration (web podcasts, blogs, website and virtual learning platforms) which extended teaching and learning beyond classroom creating greater learning flexibility; (2) Instructors using model videos demonstrate expectations and clear benchmarks of performed skills. Interacting with dance videos helped students to progress beyond technical motor skills; (3) Using video as a teaching/learning tool is specific to individual needs. Corrections applied more when they could view video podcasts of technique class and the corrections given by instructors. 2. Concern amongst students about misuse of video podcasts and cyberbullying.
16. Maloney S., Paynter S., Storr M., Morgan P. (2013) 2. Australia	1. Mixed method design; Documents the challenges and rewards for implementing student self-video into a modern clinical skills curriculum. 2. Physiotherapy students in their final pre-clinical semester (n=60). A. survey to assess the number of takes they made, what type of video device was used, source of "patients", number of technical difficulties, and opinion on method utility/self-reflection. Five point likert scale; Quantitative data was tabled, and median and interquartile range was applied.	1. 34% of students experience technical difficulties over the 9 week course. • Students agree: (1) Time spent on the activity was reasonable for the educational benefit; (2) using non-classmates as SPs allowed for improving communication skills. 2. Approved by Human Research committee of Monash University; Informed consent and right to withdraw. 3. Could address issues on distance for students who study remotely. Recommend for formative evaluation and comparison of student perceptions of this teaching method versus the more traditional one.

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17. McIntosh C., Patterson J., Miller S. (2018) 2. New Zealand	1. Qualitative Survey; To determine how students experienced the process of completing a Video Assessment of Midwifery Practical Skills (VAMPS) and to identify the benefits and challenges of this method from a student perspective. 2. First year female midwifery students (n=117). A. Qualtrics survey platform with 3 sections; Demographics, student experience with VAMPS and overall student experience; answers on a 5-point likert scale. Data analyzed via excel spreadsheet.	1. 39/117 students responded to the VAMPs survey, 33% combined response rate from the 2 years. All agreed that self-evaluation was a valuable part of the assessment. The highest rating was the students' ability to complete the tasks from their local area which enabled students to develop confidence with communication, physical assessment and practical skills through repetitive practice in a simulated environment (enhanced with self-assessment/reflection). 2. De-identified data. Students had option to remove data/comments from the survey. 3. Institution needs to provide adequate support for students engaging in new forms of assessment as students felt stressed with technology aspect. This study option is beneficial for indigenous peoples where learning be at any place/time.
18. Myung, Kang, Kim (2010) 2. Korea (ROC)	1. Qualitative and quantitative analysis of open and closed questionnaire items; Assess the usefulness of smartphones (SP's) for learning clinical skills. 2. Third year post-graduate med students (n=499). A. Descriptive Statistics.	1. 75% of feedback was 30-60 mins long, 84% believed duration to be adequate, 92% believed tutor accurately determined student strengths/weaknesses. 87% Satisfied or fully satisfied with the program. Open: Suggested > variability WRT disease. Authors conclusion: SP's should emphasize the formative NOT summative purpose of SP's.
19. Naik et al. (2018) 2. USA	1. Qualitative design; to determine the impact of personalized video feedback on an advance preparation task in suturing skill of medical surgical interns; nonrandomized study. A. Compared performance (timed) on suturing in a multistation assessment against residents from the previous year (no-feedback group). Objective Structured Assessment.	1. Feedback group (FG) had a higher completion rate for the suturing assessment than the no-feedback group(NFP) (23/28 [82%] vs. 8/27 [30%], P < .0001). • FP suturing station at a faster rate than NFP (hazard ratio 4.9 [95% confidence interval (CI): 2.2, 11.2), P < .0001). • Objective Structured Assessment of Technical Skills scores indicated no significant difference between groups (mean difference [5-point scale] = 0.3 [95% CI: 0.0, 0.6]) • FP had significant improvement from baseline to final performances (mean difference = 109 seconds [95% CI: 79, 140]).
20. Nilsen & Bærheim (2005) 2. Norway	1. To explore student experiences of receiving feedback on their videotaped consultations and provide insight about how this can be refined and further developed. 2. In the course (n=120)(19/75 med students). Avg age was 27.1 years, 58% male, all Norwegian descent. Interviews were audio recorded and an assistant took notes. A. Interviews were transcribed and analyzed in a qualitative mode.	1. 3 major themes: (1) concerns: carrying out a consultation in an unfamiliar setting, embarrassment, fear of lack of knowledge, fear of inadequate personality or communication skills, fear of incompetence; (2)feedback process; (3) reassurance. • Students anxious prior to filming and feedback discussion. 2. Informed consent from patients and students. Written consent not obtained.
21. Paul F (2010) 2. UK	1. To explore student nurses' thoughts on using a video-recording of their performance of CPR as a self-assessment tool in preparation for a prospective or re-examination OSCE. 2. Students in the shortened program from graduates (n=14) and 6 volunteered to participate (5 female, 1 male). A. Checklist, semi formal interview 3. learning theories: stimulus-response (conditioning) and reinforcement.	1. 2 students passed with scores 8/10, 4 students failed with 7/10. After self-assessment of their own videos, students rated themselves higher than the instructors did. (one 10/10, 2 9/10, 2 8/10, 1 7/10). All students said that the OSCE and video was useful as the video allowed them to "see themselves" as opposed to trying to recall components of their performance. 2. University research ethical approval and permission from the School's research committee was granted to access students and conduct the project. Informed consent and right to withdraw.
22. Risner and Anderson (2008) 2. USA	1. Integrating technology into the dance curriculum and increasing Digital Dance Literacy in undergraduate dance education. A. Survey. 3. Pedagogical philosophy that frames their work is relational, contextual, subjective, and integrated.	1. Survey showed students believe their digital learning education benefits them; also report that their choreographic work has improved with enhanced use of video technologies for rehearsal preparation and performance • e-portfolios students developed communication skills, self-promotion (for the job market), technological skills, aesthetic awareness and independence, technical and personal growth, confidence, and self-awareness • Technologies extend dance pedagogy, a balance b/w intellectual (a.k.a. sitting) and physical learning, kinaesthetic experience.

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23. Sainsbury et al. (2017). 2. Canada	1. Quantitative design; assesses feasibility and determines sample size for a subsequent trial comparing DL instruction using a Macintosh-style video laryngoscope (MacVL), with and without video recordings, with conventional DL instruction. 2. (n=68) Two-week rotation in anesthesia during their third year; (n=23) control MacVl; (n=22) VL-1-verbal feedback; (n=23) VL-2-verbal feedback and videorecording.	1. Successful TESTING intubation for 3 groups (37/37 Control; 25/29 VL-1; and 41/46 VL-2). • Only 78/110 (71%) TRAINING intubations in the VL-2 group were video recorded • Significant mean time to intubate b/w the Control and the two VL group (Control, 91 sec; VL-1, 61 sec; VL-2, 66 sec; P=0.018). 2. Research ethics board (REB) approval was granted. 3. Limitations of study relate to the students, patients, devices, and instructors. As we did not capture students' baseline time to intubate, there may be preexisting differences b/w groups.
24. Sarrab (2015) 2.. Oman	1. To compare students' knowledge, awareness, attitude, and interest in m-learning in relation to traditional face-to-face learning. 2. Part 1: surveys (three phases: General information, M-learning knowledge and M-learning perception); Part 2: formal interviews (n=56) university students from computer engineering and science departments in University of Sultan Qaboos.	1. m-learning (video) sharing: a) Advantage beyond traditional learning environments; b) Allows to stay mobile and connect to course materials that are available 24/7. c) Students' were interested in using their m-devices to make high production videos of course presentation slides (as well as reading articles, submitting assignments, participating in discussion forums, and setting assignment alarms for themselves).
25. Seckman (2018) 2. USA	1. Quasi-experimental cross-sectional interventional design; to evaluate the impact of IVC versus text-based feedback on teaching, social, and cognitive presence in online learning communities. 2. Undergraduate and graduate informatics course; n=250 students. A. Community of Inquiry Questionnaire (COIQ):to determine perceived level of presence experienced by the student in an online learning community; Cronbach's a coefficient reliability for teaching (.94), social (.91), and cognitive presence (.95).	1. Student characteristics of the text-based group were similar to those in the IVC group • There was a strong positive correlation between cognitive and teaching presence (r=0.788, P G .01) and cognitive and social presence (r=0.715, P G .01). • Highlights importance of faculty interactions with students. 2. Permissions from the institutional review board and appropriate committees were obtained prior to starting study. 3. Use of Internet links, videos, and other technologies must be checked and frequently updated to ensure they are functioning properly.
26. Seif, Brown, Annan-Coult (2013) 2. USA	1. To create, view, and reflect on video-recorded simulated patient history and physical examination. 2. 1st year PT doctoral program students at Medical University of South Carolina - (n=252) students for self assessment and (n=121) second year students as peer-assessors over 2 years. A. Developed self and peer assessment forms, tested for validity/reliability.	1. Identified themes from student feedback: a) General comments about the performance of the history or clinical examination b) Descriptions of therapist behaviors related to the examination and the patient interaction and; c) Behaviors specific to building patient rapport. Results provided support of the learning activity being effective for both medical and allied health educational programs.
27. Shen (2013) 2. China	1. To evaluate the effect of video recording system in nursing simulation practice. 2. Sophomore full-time Nursing students; Participants randomly divided into 2 groups: (1) Experimental group (n=69); (2) Control group (n=70) A. Performance assessed by performance checklist developed for catheterization Tested on 2 components, insertion and communication. SPSS v 15.0 Independent-samples t-test for difference b/w experimental and control for scores on measurement of catheterization, communication, and student satisfaction.	1. Experimental group had significantly higher scores for catheterization communication and self-reported satisfaction 2. Check list was validated by professors who were blind to the experiment. All participants were notified that their participation was voluntary and nonparticipation did not affect their grade. Students in control groups were given their video after the experiment was completed.

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28. Smallheer, B. A., Stone, E., Hicks, J., & Galbreath, C (2017) 2. America	1. Qualitative design; use of video recording technology affords students the opportunity to engage in reflective practices of physical assessment and psychomotor skills checkoffs outside of a traditional instructor proctored evaluation session 2. Pre-licensure nursing program, 1st semester students (n=18) A. Open-ended questionnaire on thoughts and perceptions pertaining to video practice.	1. Results (1) Self-reported in groups that prefer peer/self feedback: Decrease in anxiety from absence of evaluator which increased focused learning. Increased feelings of competency. Decreased stress from scheduling flexibility. (2) Preferred traditional proctor feedback: immediate feedback with high confidence in feedback regarding skill performance and areas of improvement. Better for skill checkoff tasks that learn from their own mistakes in a safe environment. (3) Limitations: time and labour intensive, technology was distracting, feelings of inauthenticity, lack of privacy. 3. Video provides opportunities to reduce faculty time proctoring labs, > students self-reflection and self-evaluation.
29. Srinivasan, Hauer (2007) 2. USA	1. B/w groups experimental design; Examine impact of receiving feedback via performance benchmarks on medical students' self-assessment after a clinical performance examination (CPX) 2. 3rd Year Graduate Medical School Students (n=280) across 3 schools. A. Pearson's correlations b/w self-rating and S&P ratings. Cronbach's Alpha for checklist tool=0.77, 0.79, 0.91.; Initial student self assessment - 5pt likert for global performance	1. Physical examination mean scores lowest (51%, SD=11) Top Quartile students showed greater concordance b/w self assessment scores and smartphone (SP) scores; Bottom Quartile students showed disconcordance b/w self assessment scores and SP. Concordance improved in the group that received performance benchmarks ($P<0.05$ for physical exam, $P<0.01$ for History taking), but continue to over-rate performance (high discordance after phase
30. Tomczak (2011) 2. USA	1. Anecdotal; the success of using video along with a rubric to give students a more concrete grade regarding their performance	1. Students' satisfaction > with assessments when they can observe their dancing and see how instructor assessed their dancing in relation to the course rubric; combining video w/ rubric helps her evaluate a subjective art form more objectively. • Student-centred development through collaborative learning by using self and peer-to-peer critical reflection, feedback, and assessment of video. • Instructors using model videos (of themselves or hired dancer) to demonstrate expectations of performed skills.
31. Tossell et al. (2015) 2. USA	2. Loaned undergraduate students (mostly majoring in Natural Sciences and Engineering) smartphones and tracked their use of the devices for one year; open-ended survey questions and self-reports. A. Naturalistic data collection.	1. Some students did not use their smartphones for educational activities, instead found to be a distraction; showed that smartphone tech in itself does not enhance learning but only with active, proscribed, and structured activities and tasks it did.
32. Vaughn, C. J., Kim, E., O'Sullivan, P., Huang, E., Lin, M. Y., Wyles, S., ... & Chern, H. (2016) 2. USA	1. Experimental study- Mixed methods design; Investigate the effects of peer vs. faculty feedback on student created home-video assignment on surgical skill competency. 2. 24 surgical interns. (Peer Feedback, n=12) (Faculty Feedback, n=12). A. (i) Repeated measures ANOVA; (ii) Paired t-test: compare PF and FF scores; (iii) Wilcoxon matched-pairs test; (iv) Mann-Whitney statistic for nonparametric tests: satisfaction survey for 2 groups. 3. Fitts and Posner's theory on the 3 stages of learning, watching another student perform task improves performance, giving feedback improves performance.	1. No significant differences b/w the grps for baseline skill. All grps improved from baseline, performed better in home-videos vs. final evaluation, and preferred in-person feedback than written. Peer gave a higher global score than faculty for all assignments. No significant difference in quality of feedback. Home-video curriculum encouraged practice but interns did not rewatch videos. 2. Videos de-identified. 3. Suggest that the stressful assessment environment or the delay time b/w completion for the assignments and the final assignment. Learner performances are not consistent. When using a checklist there's a potential advantage to reviewing another's performance.
33. Vnuk A (2006) 2. Australia	1. Within-groups Design; To assess their own performance, and how video may improve accuracy of self-assessment. 2. 1st year Medical Students (n=95) A. A singular item with a 6-point descriptive global scale. Self-graded and single expert-graded based on International Liaison Committee on Resuscitation (ILCOR) guidelines. Within group reliability (cohen's weighted k) and Unweighted if discrepancy was pass and fail. Wilcoxon signed-rank test for sig. differences in paired ordinal data, McNemar's test for dichotomous entries.	1. Before viewing, students' scores (mean 4.4) were higher ($p < 0.01$) than the expert (mean 3.9). After viewing, n=4 increased score and 36 decreased their score; (p=0.29). 19 of the 40 changed to match the expert. • Kappa (k) statistics comparing the expert and student: agreement; Student pre & post ratings: k=0.33 ("fair); Student pre-video & expert ratings: k=0.03 ("slight"); post-video & expert ratings k=0.002 ("slight"); pass/fail pre-video & expert ratings k=0.05; pass/fail agreement pre-video & expert ratings k=-0.07 3. More opportunity to view complex assessment task video. Include the use of benchmarking.

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34. Wake (2018) 2. Australia	1. An overview of last two decades of digital pedagogies in the performing arts.	1. 3 Ways employing digital technologies in teaching: (1) Minimal integration (emphasis is on face-to-face learning); (2) Blended models; and (3) Entirely online • Use of mobile phones for photos and videos (record rehearsals, class discussions, etc). • Accessibility an issue in the success of video technology integration • Time-consuming and raise copyright issues
35. White, Ross, Gruppen (2009) 2. USA	1. Quasi-experimental, assortment; Does a remedial video review of failed OSCE improve self-assessment skills? 2. 4th year Med students that failed an OSCE, 42 students with 57 failed OSCE stations. A. Analyzed using independent and dependent t tests and within subjects ANOVA.	1. Improvement b/w students' first and second attempts, improved self-assessment. No sig. differences b/w self-assessed conditions and faculty-guided conditions and self reflection. 2. Ethical considerations necessitated that ALL students failing >1 Sem receive additional faculty feedback.
36. Winters et al. (2003) 2. USA	1. Reviews the literature on video-taping and discusses video-taping as a teaching-learning strategy used to help students develop effective communication, physical assessment, and selected psychomotor skills. 2. Junior Nurse Students A. Unstructured feedback	1. Positive Feedback: Anxiety produced at beginning then decreases but resolved after first assignment. Increased skill acquisition, self-confidence, self directed thinking, more time-efficient for instructors than direct observation. "Removes the distraction and pressures" of faculty observation on student performance, therefore a more true assessment. Negative Feedback: Equipment and technical issues, coordination, > burden to coordinate with group. 3. Criteria for grading purposes should be clearly explained.
37. Yoo et al. (2009) 2.. South Korea	1. Quasi-experimental/control pre/post test design; To examine the effects of video-based self-assessment on ability of nursing students to measure vital signs, to use communication skills, and their satisfaction of this teaching method. 2. 2nd year nursing students in the Fundamentals of Nursing course (n=40) A. Statistical package for the social sciences, individual-samples t test, NSPC checklist, questionnaire.	1. Pre-test performance scores were compared for the 2 groups- in post-test data, students had significantly higher scores for VS and communication than the control. • Independent t-test showed that students in the video self-assessment group reported greater satisfaction ($p < .001$). 2. Informed and signed written consent. blinded experimental conditions; participation voluntary.
38. Yoo et al. (2010) 2. South Korea	1. Pre-post test quasi experimental study; To implement a new teaching method for a regular course, and to describe the effectiveness of self-reflection. 2. Sophomore nursing students (n=40); exp group (n=20), control group (n=20), split up based on pre-test scores. 2 males and the rest were female A. Foley catheterization: performance checklist, communication skills: communication assessment tool (CAT), learning motivation: Instructional Material Motivation Survey (IMMS)	1. Experimental group showed a statistical sig. in scoring higher skill competency ($p < 0.001$), communication skills ($p < 0.001$), and learning motivation ($p=0.018$) compared with the control group • Exp group remembered and performed the procedures better than the students in the control group did. • Students in the exp group continuously improved their communication skills even after the pretest • Learning motivation of the students in the experimental group > at the post-test, whereas that of the students in the control group <. 2. Informed consent was obtained.
39. Zhou and Li (2018) 2. China	1. Examine the application of mobile blended learning to three theatre arts classrooms at a university in Macau. 2. Undergraduate dance and theatre course (n=14). 3. Using polls, semi-structured student group and individual faculty interviews, and observations.	1. Teaching through a combined approach (m-learning, blended learning, in class/online lectures) enhanced teaching and learning experiences. Participants preferred the instructor's use of mobile blended learning over traditional in-class lecture teaching. 90% of their survey participants agreed or strongly agreed that blended m-learning enhanced their learning experiences. 88.4% participants preferred using mobile technology because of its small size, availability, and flexibility. • Students felt interactive m-learning transformed classrooms from "rigid" to "fluid" and enabled the customization of courses for own learning needs. • m-devices extended teaching and learning beyond classroom limits of time and space • Use of video in m-learning also assists ESL students

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40. Anderson (2012) 2. USA	1. Anecdotal account that pursues the question: "How can advances in music and video technology contribute to an expansion of high-quality, online dance education?"	1. Discusses how technology skills, digital literacy, and choreography skills are developed through the process of making and editing dance videos. Report the > student use of smartphones and web-enabled mobile devices and social media platforms to record, edit, and share videos with minimal effort. He showed how the creative process was instantly documented in collaborative learning projects within online networks. He described how this process augments traditional teaching practices by enabling peers and teachers to view and comment on each student's progress. Report how video technology dissolves traditional hierarchies b/w dance experts and learners. This model positions teacher and student as co-editors, "mutually involved in dismantling and re-assembling cultural ideas and products" (McWilliam cited in Anderson 2012, 22). 2. While Anderson discusses need to consider student access in socio-economic status, he does not address privacy and confidentiality issues with the use of online platforms.
41. Cherry et al. (2003) 2. USA	1. Anecdotal description: "This paper describes how a computer-based video annotation tool called Video Traces can be used to facilitate reflection and critical evaluation in dance." The authors "present preliminary findings from a classroom-based study of our use of Video Traces in an undergraduate class in dance composition."	1. Discuss how choreography and reflective thinking skills developed through the process of making and editing dance videos through digital video annotation tools such as Video Traces. 2. Technical issues occurred because they were using tech that was not web-enabled. 3. Tech issues resolved with the use of the web. Doesn't address privacy and confidentiality issues associated with video making and sharing.
42. Dania et al. (2011) 2. Greece	1. Literature Review "The aim of this study is the analytical and critical presentation of the researches focusing on the application of technology on movement education with emphasis on physical and dance education." Described use of interactive multimedia (including video) for teaching traditional non-Western dance forms.	1. "Although contemporary technological media are substantially advanced and innovative, they have not been incorporated in the classroom everyday learning practice yet. A prerequisite for the achievement of this goal is the researchers' interest to be focused: a) on the cognitive aspects of a technologically supported instruction and b) on the design of multimedia products according to the principles of the modern theories of multimedia learning." Interactive video not an effective tool for teaching dance. Possibly because they were looking at interactive video and multimedia (photos, graphs, video interactive depictions, audio, etc) as a full replacement of the traditional live teaching model. Most scholarly sources drew from qualitative research methods.
43. Leijen et al. (2008) 2. Netherlands	1. How dance students experienced learning within an international distance education program whereby content was delivered in an e-learning format using a virtual learning environment platform. 2. Mixed-method (n=42 students) collected using questionnaire (with a five-point Likert scale and short answer responses) and group interviews. "descriptive statistics relating to the students' satisfaction with the organization, interaction, guidance, feedback, own learning and learning outcomes were calculated. A t-test was used to examine whether students' satisfaction with the organization of the courses, the interaction part of the pedagogy, guidance and feedback provided by teachers differed in their perceptions throughout the whole educational program. A Bonferroni method was used to correct the level of significance of 5% for the number of t-tests. The aim of the analysis of the qualitative data was to divide the information collected into meaningful units, and to synthesize these units into meaningful themes. [...] The transcribed group interviews were analysed using content analysis method." (153)	1. Described use of video and other online resources for long-distance dance education. Teacher's guidance and feedback found to be the most important factor for all e-learning assignments. Practical assignments were more limited, with the available elearning tools, than other learning tasks. 2. Collaborative course work for online international courses frustrating for learners due to technical issues, caused disruptions, and confusion working across different time zones. 3. Teacher's guidance and feedback on students' work crucial in a long-distance e-learning dance education environment. "Further research is needed to investigate the influence of online distance education on students' learning outcomes." (p.160) No discussion about the ethics of video sharing, privacy and security.

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44. Lepczyk (2009) 2..USA	1. Explores how dance instructor uses technology, including a course website, YouTube, iPods, and web-enabled cell phones, to teach dance skills. 2. Quantitative and qualitative analysis of two surveys administered in creative dance class focused on questions about the use of YouTube as a student resource to research dance moves and styles for course assignments.	1. Most students (37/55) used YouTube to research and learn dance moves and styles for course assignments. M-phones worked well to capture dance movements to share with groups Students video-taped themselves using m-phones with a partner, which was helpful for student learning and creativity. 2. Limited video capacity on students' m-phones
45. Mabingo (2015) 2. New Zealand.	1. Examine the integration of technologies (iPads, smartboards, iPods, iPhones, audio recorders) and online platforms (YouTube and Wikispace) to teach Ugandan traditional dances. 2. Autoethnographic and practice-based account of integrating tech into K-12 dance programs in New York City schools to teach traditional Ugandan dance. Thematic analysis based on students' reflections, the author's journals/logs entries made when conducting classes, observations of students' engagement in class activities. 3. Draws on the "constructivist theoretical paradigm (Bruner, 1961, 1998; Dewey, 1938; Kolb, 1984; Vygotsky, 1978), Johassen, Peck and Wilson's (1999) thesis of constructivist perspective to learning using technology and Gore and Bakka's (2007) idea of concept and realisation in constructing dance knowledge." (p. 315)	1. Advocates use of interactive multimedia (including video) for teaching traditional non-Western dance. Video (along with wider interactive multimedia) might broaden intercultural/multicultural understanding through guided creative experiences in diverse cultural practices and traditions and widen social and cultural perspectives in learning/teaching. 2. Ethical issues related to appropriation of using web-enabled tech and video to teach dances (such as African dance) outside of their socio-cultural and political context. Hierarchies are similarly perpetuated when the (caucausian) expert is the model to emulate. 3. Concerned about cultural appropriation in the dance technique class setting, for Mabingo (2015) technology-mediated instruction (video, photo, etc) supported critical investigations of the body as a site for activating, negotiating, embodying physical, cultural, political, spiritual, and social experiences, expressions, and realities.
46. Morgan (2015) 2.. USA	1. Concerned with student identity and embodied learning through web-enabled smartphones. 2. 16 undergraduate female dancers, who described online dance learning activities as sensorimotor experiences. 3. Morgan analyzes this feedback in relation to posthuman, feminist, and embodied cognition theory to understand that bodies were extending, scaffolding or blooming with the internet environment as well as the technologies in which they engaged (2015).	1. Web-enabled m-technology is already embedded within a dance student's sense of self, education, and career goals Students shared their videos on social media and enjoyed getting peer feedback from dancers and non-dancers - resulted in > in confidence that they were doing well with their dancing/choreography. 2. Morgan does not question the potential negative consequences for such online integration with a students' sense of self. Instead, Morgan's goal is to think about the perceptions that students have about their education, and how they can bring about new theories in the field of dance education.
47. Parrish (2008) 2.. USA	1. The article presents iDance Arizona research on the effectiveness of video-conferencing for university/K-12 collaborations in a long distance, rural dance pedagogy context. 2. One year case study to explore the use of video-conferencing technology to teach elementary and junior high school students to dance. The video-conference curriculum, pedagogical methodology, student and teachers' attitudes towards video-conferencing (obtained through student journals and transcribed interviews (n=16), teacher observations, and video recordings of sessions), and their perceived value of the instruction were analyzed. During phase one, 24 video conferencing sessions and 16 live dance classes were conducted. Phase Two included 12 videoconferencing sessions and eight on-site live classes. 3. Parrish (2008) drew from John Dewey's experiential and experimental education philosophy as well as Howard Gardner's (1983) concept of multiple kinds of intelligence, or pathways to learning (linguistic, logical-mathematical, bodily-kinesthetic, spatial, and musical) and the need to provide multiple entry points to learning through interactive multimedia. Parrish notes that interactive video and multimedia technology supports multiple learning styles and strategies.	1. Describes use of video and other online resources for long-distance dance education. Found that m-devices extended teaching and learning beyond classroom limits of time and space – creating greater learning flexibility. 2. Reported technical issues interfering with smooth video interactions. Parrish pointed out the geographic and economic barriers to learning dance faced by those living in rural communities. 3. Demonstrated how video technology was used to provide access to dance learning opportunities not found in rural communities and break down economic, geographic, and socio-political barriers.

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48. Risner (2009) 2.. USA	1. Anecdotal article from a conference panel on dance pedagogy. 2. Analysis on female students in an undergraduate dance pedagogy course. 3. Critical and feminist pedagogies.	1. Discussed shift to web-enabled smartphone video learning and emphasized how video technology needs to reaffirm creativity, discipline, and the centrality of the moving body. According to Risner (2009), m-devices enable relevant dance pedagogy and enable students to engage socially and with coursework. Argued that the efficacy of using video for skills is enhanced when instructor takes position as a guide. Author takes a "meddler-in-the-middle" pedagogical approach (McWilliam cited in Risner 2009) Discussed the importance of embedding a carefully described technology tool, its function and effect from multiple entry points. Risner's students were also tasked with researching a technology tool and developing a "user-friendly" step-by-step guide to use. 2. Author concerned about gaps in critical thinking about the ways in which power and authority operate in the dance studio. 3. According to Risner (2009), video tech might be used to > social engagement in dance and address social issues. Risner (2009) highlighted that video (along with wider interactive multimedia) may broaden intercultural/multicultural understanding through guided creative experiences in diverse cultural practices and traditions, and widen social and cultural perspectives in learning/teaching.
49. Chang, E., & Park, S (2017) 2.. Korea	1. Non-equivalent control group, Quasi-experimental pre/post-test design; Identify effects of self-evaluation using smartphone recording on competency in nursing skills, satisfaction and learning motivations in nursing students (P.118) DV1: Protocol competency regarding Foley catheterization Sub measures of Nursing skills scores Measured by "technique nursing assessment, measurement tools Korea Nursing Education Assessment" Likert scale from 1-3 (not performed, insufficient, performed) DV2: Self reported – Student Satisfaction 17 items (by YOO;2001); 5 point Likert scale Cronbach's alpha: Previous studies: 0.94 Pre-test: 0.86 Post-test: 0.89 DV3: Self reported – Learning intrinsic motivation Modified 13 item test by (Kim, 2008) Cronbach's alpha: Previous studies: 0.85 Pre-test: 0.87 Post-test: 0.90 2. 82 second year nursing students, Gyeonggi (Korean province) No statistical difference b/w population of experimental and control groups. Mean age of 21 A. X2 test, fisher's exact test, independent t-test, paired t-test.	DV1: Protocol competency – Foley Catheterization checklist Found no statistical differences b/w scores on nursing skills. Found sig. > in intervention group communication skills (p=<0.001) DV2: Student Satisfaction: Statistically sig. > (p=0.027) DV3: Learning Motivation: No Statistical difference 2. Study approved Research Ethics Board (IRB no. EU 15-36) 3. Recommendations: Repeat with larger sample across universities, modification of motivational assessment tool (how?) Increase voluntary repeated practice and evaluation with peer review.

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50. Paul S, Dawson K. P., Lanphear H., Cheema M. Y (1998) 2. United Arab Emirates	1. Primary objective to teach skills in history taking, physical exam of children and developing rapport with patients (pts) and their parents. Objective 1: to determine feasibility of approach for teaching and assessing clinical skills Objective 2: to obtain students perceptions about effectiveness of videotape feedback. Students divided into 4 groups and told that encounters with real pts and parents would be video recorded. They were assessed separately and continuously on the ability to demonstrate history taking, interviewing and physical examination. Students recorded each other using a camcorder. Students received feedback on 3 things: 1) self feedback/self-critique, 2) peer feedback, 3) instructor feedback. There were 24 items in 4 categories (history taking, interview skills, physical examination technique, overall ratings). Scored on a 5 point scale (1=lowest, 5=highest). 11 tapes were randomly selected for the study. Students used checklist and filled out questionnaires at the end of the course on their perceptions of 3 areas: process/technique, feedback, overall rating. 2. 27 male and female students entering 6th year of medical curriculum at the United Arab Emirates University. A. Questionnaires, checklists, analyzed by SPSS and Kruskal Wallis one-way ANOVA.	1. 25 students (95%) out of 26 believed they would have done better if had the opportunity to view a few standard videotapes of interviewing and history-taking skills prior. More than 88% of participants agreed they would've gained confidence if instructors would have shown them videos of paediatric procedures and investigations. 92% considered interaction b/w doctor, pt, parent to be very important. more than 80% (M=4.14 SD=0.78) felt comfortable dealing with real pts and 92% said they gained confidence dealing with real pts. Majority strongly believed that self-review improved their skills. 85% liked peer and instructor feedback and 15% didn't like interaction among faculty and students 69% of students indicated that video camera aroused anxiety, self-confrontation and resistance to videotaping.
51. Hammoud (2012) 2. USA	1. Meta-analysis; Determined if video review of student performance during pt encounters is an effective tool of medical student learning. 2. 67 Articles, from 1968-2010 with the following terms: medical students, medical education, undergraduate medical education, education, self-assessment, self-evaluation, self-appraisal, feedback, videotape, video recording, televised, and DVD. A. Identify Trends	1. Considerable variability b/w studies, most were non-controlled, and performed during clinical years. Video recording of performance with student review with expert feedback had positive outcomes in improving feedback and ultimate performance. Video review with self-assessment alone was not found to be generally effective, but when linked with expert feedback was superior to traditional feedback alone. 3. More research in this area is recommended. Additionally combining student self-assessment with feedback from faculty or other trained individuals for maximum effectiveness.
52. Hecimovich (2010) 2. Australia	Research Methodology 1. Quantitative design; purpose was to determine effectiveness of clinician feedback and video self-assessment on history-taking skills. Was randomly divided into two groups: one who received clinician feedback immediately after taking patient histories and one who completed video self-assessments after taking patient histories. The clinician feedback group received feedback after each of three separate patient encounters, while the self-assessment group performed self-assessments of video-taped encounters after each of three separate patient histories. These interventions occurred once each trimester. Students were also required to complete a Viva Voce examination that included history taking. The scores were matched. 2. Yr 5 chiropractic students (n=51) clinician feedback group (n=26) 12 male, 14 female self-assessment group (n=25) 9 male, 16 female A. History Taking Objective Structured Teach Experience (OSTE) form, checklist, Viva Voce examination, performance evaluation form, patient history assessment form, unpaired t-test, two-way ANOVA, GraphPad prism 4.1 3. Theory	1. Neither the mode of feedback, gender of the student, nor an interaction b/w the mode of feedback and gender had an effect on the overall behavior scores. 2. Ethical approval from Murdoch University's Human Research Ethics Committee for this study, participating pts signed a consent form, 3. Use of video self-assessment needs to be evaluated on whether students are comfortable with this kind of assessment

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53. Zick A., Granieri M., Makoul G. (2007) 2. USA	1. Examined the medical students' self-assessment of their developing communication skills. Used open-ended questions to avoid prompting that is associated with a checklist. Used videotaped encounters with SPs as the basis for self-assessment. A 12 week unit that uses the SEGUE framework that outlines communication tasks and allows students to practice advanced skills. For 9/12 weeks, students are split into groups of 3-4 to work with patient instructors. All interactions are video-recorded, and students review their performance on video each week. On the last week, the students work one-on-one with the patient instructors, engage in a full encounter for 10 minutes, receive brief feedback and watch their encounter video immediately after and complete a communication-skills self-assessment. 2. 688 first-year medical students (14 dropped from the study) A. Self-assessment forms about observed strengths/weaknesses. Developed mutually exclusive and exhaustive categories for content analysis, and coded.	1. Identified strengths of encounter: elicited information/covered important topics, made a personal connect/established rapport, was supportive/encouraging/helpful, attended to conversational flow/transitions, ensured patient comfort. 2. 8 areas identified for improvement: paralanguage, kinesics, facial expression. 3. An open-ended approach to self-assessment of communication skills can serve as an important component of a systematic education and evaluation program.

APPENDIX C: STUDY DATA : PARTICIPANT DEMOGRAPHIC

Students		Athletic Therapy	Dance	Engineering	Nursing
Total Participants		25	51	93	108
Gender	M	44%	6%	82%	11%
	F	56%	94%	14%	89%
	T	0%	0%	3%	0%
Age	17-19	0%	46%	31%	0%
	20-25	88%	52%	64%	44%
	26-30	8%	0%	3%	26%
	31-35	4%	0%	0%	10%
	36-40	0%	0%	0%	7%
	41-45	0%	2%	0%	6%
	46-50	0%	0%	0%	2%
	51-55	0%	0%	0%	1%
	NA	0%	0%	2%	4%
SAS	Y	12%	19%	9%	21%
	N	64%	75%	81%	79%
	N/A	24%	6%	11%	0%

Faculty		Athletic Therapy	Dance	Engineering	Nursing
Total Participants		4	6	5	19
Gender	M	25%	0%	100%	16%
	F	75%	100%	0%	84%
	T	0%	0%	0%	0%
Age	31-35	0%	0%	0%	11%
	36-40	0%	17%	0%	47%
	41-45	25%	33%	60%	5%
	46-50	25%	0%	20%	16%
	51-55	0%	17%	0%	5%
	56-60	25%	0%	0%	11%
	61-65	0%	33%	20%	5%
	NA	25%	0%	0%	0%