Embodied Reflective Practices in Ballet: How Video Technology Mediates Reflection Across Time, Scale, And Bodies

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Abstract: This ethnographic study explores the role of video-analysis technology on embodied reflective practices in the context of a youth classical ballet school. Interaction analysis shows how the video technology supported embodied reflection between students and teacher in refined and intersecting ways. Our data point to a "cascading effect" of the video reflections that emergently spread reflective practices across teachers and students individually and collectively. Our analyses show how reflection is different in embodied contexts, suggesting the need for theory refinement to explain reflective practices and analytics in embodied learning contexts.

Key words: embodied reflection, cascading effect, video-analysis-based technology

Introduction

The concept of reflection in education, and reflective practice more specifically in professional contexts, have been studied for almost four decades (Boud, Keogh, & Walker, 2013; Schön, 1987) A common characteristic of theoretical perspectives on reflection and reflective practice is that they value the cognitive aspect of reflection for individuals (Borton, 1970; Gibbs, 1988; Kolb & Fry, 1975). This research focus implies that individual cognition plays a superior role to the rest of the human body, other people, and material resources in the reflective process.

However, reflective processes can be driven by the human body (Lee, 2015). In fact, Schön (1987) acknowledged that the relationship between thinking (mind) and doing (body) is a continuity, rather than a dichotomous entity (Kinsella, 2007; Schön, 1987). *Embodied reflective practices* – or reflection on experiences involving physical movements of the body as resources for learning – appear to have distinctions that previous reflection research has not considered. Recently, researchers have begun to expand conceptions of reflection to include embodied contexts in professional fields, e.g., nursing (Ranheim, Kärner, Arman, Rehnsfeldt, & Berterö, 2010) and psychotherapy (Leigh & Bailey, 2013; Worsfold, 2013) and sports (Maivorsdotter & Lundvall, 2009). This study investigates embodied reflective practice for learning in the context of the performing arts – specifically classical ballet. Using video-based interaction analyses, we shed light on nuanced differences in reflection within a context that supports multiple forms and scales of learning, including the body, technology, teacher, and other learners.

Conceptual framework

In the Learning Sciences, embodiment has been studied in school-based contexts such as math, science, civics, among others (Enyedy & Danish, 2015; V. R. Lee, 2015; Ma, 2016; Taylor & Hall, 2013). Ma's study involved embodiment in learning geometry by learners moving their bodies, arms, and hands to form walking-scale geometric shapes, holding tape to form the shapes' sides. Enyedy and Danish studied embodied participation in augmented reality-supported learning of physics through play. Taylor and Hall studied embodiment on a larger scale of mobility – Learners explored urban planning of existing neighborhoods, learning along lines by biking in the city. Lee studied embodiment from the physical activity data collected through wearable tracking devices.

Others have explored embodiment in out-of-school settings including science museum exhibits (Lindgren, Tscholl, Wang, & Johnson, 2016), skateboarding (Hollett, 2019), and children's gardens (Land, Zimmerman, Maggiore, Kim, & Briskin, 2017; Zimmerman, Land, & Jung, 2016). We are studying the out-of-school learning space of the ballet studio, where actions and thinking are inherently embodied. We argue that reflection in embodied contexts looks different from how it looks in classrooms or workplaces, and hence is important to study.

Much of the research related to embodied learning relies on technologies, e.g., video recording, as both a mediator and an analysis tool of learning in embodied settings (Cherry, Fournier, & Stevens, 2003; Doughty & Stevens, 2002; Leijen, Lam, Wildschut, Robert-Jan Simons, & Admiraal, 2009). In this study, we introduced a video-analysis technology, *Coach's Eye*, into the teaching and learning process, as it supported both the capturing

and analysis of embodied practices. These practices could be analyzed across people, time, space, and scale dimensions. We analyze the data with the goal of identifying reflective dialogue, refinement of movement, and experimenting (Hilden & Tikkamäki, 2013; Loughran, 2002), which represent coexistence of thinking and acting on individual and collective levels.

This paper addresses the following research question: How does video-analysis-based technology support the teacher's and the students' embodied reflective practices in a classical ballet variations class?

Methods

Participants and setting

This paper investigates embodied reflective practices of ballet dancers enrolled in a youth performing arts school and classical ballet studio in a suburban town with a large university in the Northeastern United States. Data was collected over 11 sessions throughout a 5-month period (November 2018-April 2019). Eight ballet students consented to participate in the study and be video recorded. The participants were comprised of students at the most advanced levels of the school, who had been training in classical ballet for at least 8 years and ranged in ages from 13-18. The participants spent approximately 15 hours per week in the studio for technique classes and rehearsals. At the time the study took place, the dancers were preparing for an upcoming theatrical production of the ballet *Sleeping Beauty*.

The data were collected from a weekly "variations" class, which was offered one evening each week for 45 minutes. The focus of the variations class was on learning classical ballet variations, which refer to well-known choreographies from famous ballets (such as the Nutcracker) that feature solo, demi-solo, or pas de deux/pas de trois solos (e.g., the dance of the Sugar Plum Fairy; Bluebird from Sleeping Beauty, etc.). Classical variations have been performed by professional ballet companies for generations, typically choreographed by master choreographers such as Marius Petipa or George Balanchine, although many teachers adapt choreography to suit dancer abilities. Dancers and ballet instructors typically learn variations from videos that document either the full-length ballet or solo recordings posted by individuals and available on YouTube. Variation classes are typically done en-pointe (for females) and are taught at most ballet schools that train pre-professional dancers in classical ballet. The class provided opportunities for advanced dancers to work collaboratively or one-on-one with an instructor, to practice and improve solo dance performances.

In a typical class (Figure 1), the instructor prepared a 2-3-minute video of a professional Principal ballerina performing a variation. The students would watch the video in its entirety. Then, the instructor would lead the dancers through the steps, breaking down the professional's movements into small chunks of sequences that could be learned progressively. Following whole-group instruction, dancers were then divided into small groups of two or three to practice and perform the variation in front of the instructor and the other students. If class time permitted, each dancer performed the variation individually. The instructor provided corrective feedback to individual student dancers during the class as she identified errors. For the cases that are discussed in this paper, each of the dancers had been practicing the same variation for a performance for several weeks, so the class time was dedicated primarily to individuals' variations.

The video capture and analysis technology

Coach's Eye is a downloadable and widely-available app free of charge. For this study, we used the paid version of the app (*Coach's Eye Team*) to support the instructor and students in analyzing solos from the variations class. *Coach's Eye* is a mobile application originally designed for improving athletes' performances. Its core functionalities rely on the video recording and integrated slow motion, playback, video comparison, voice-over narration, and annotated drawing, which leverage the capability of video analysis (Figure 2). The research team met with the ballet teacher regularly over a 5-month period to discuss the teacher's (Reena's) goals, perceived problems, and ideas to better support youth to learn classical ballet variations. As a result of these conversations, and from analyzing video from 2 months of ethnographic video data, the research team suggested *Coach's Eye* to Reena as a tool that might help her achieve her teaching goals. The research team trained Reena in how to use the app. *Coach's Eye* was used to record the individual students' performance through a mobile device in class. The videos were stored in the shared folder in *Coach's Eye* that all researchers and the instructor could access. The recordings were analyzed by the instructor in *Coach's Eye* after the class, and the generated analysis clips were shared with the students through the app.

Figure 1. The structure of a variations class.

Research design, data collection, and analysis

Data collection occurred from November 2018 to April 2019, spanning preparation for the studio's public Spring performance of *Sleeping Beauty*. The research design was an ethnography (Spradley, 1980) of the ballet studio, focusing on one aspect of ballet training in youth performing arts. Interaction analyses (Erickson, 2007; Jordan & Henderson, 1995) provided the analytical lens for interpreting body movement, discourse, and interactions. It is noteworthy that our data collection was relational and driven by us and the instructor, Reena. As an experienced teacher, Reena was receptive to exploring ways to disrupt and enhance the traditional ballet teaching format. While our scholarly interest centered on new pedagogies for teaching and learning in out-of-school contexts, the data were shared and co-viewed with the instructor in bi-weekly meetings as a means to help her ongoing reflection. The research as relationship rather than surveillance is imperative and substantive for deepening our ethnographic inquiry (Vossoughi & Escudé, 2016).

Data sources include semi-structured interviews, video-recorded observations, and field notes. We used one video camera, positioned in a corner of the studio, to capture the class process. So as not to disrupt dancers, we gave one lavalier microphone to the instructor in order to capture her interactions with both the whole group and individual dancers. We also captured screen shots of Reena's comments to dancers within *Coach's Eye*.

Informed by our theoretical orientation, our analytic focus targeted solo variation performances of the same dancers in consecutive weeks. Importantly, *Coach's Eye* analysis clips functioned both as our data and the analytical products. The data was viewed in 3 analysis units: before recording, during video recording/analysis, and next-class recap. The first two units occurred in the same class. After reviewing the camera videos and *Coach's Eye* analysis videos, we selected 4 consecutive weeks of videos of 5 student dancers. Then, the camera video clips as well as the *Coach's Eye* analysis clips were transcribed and compared for identifying reflective practices from the student as well as the instructor perspective.

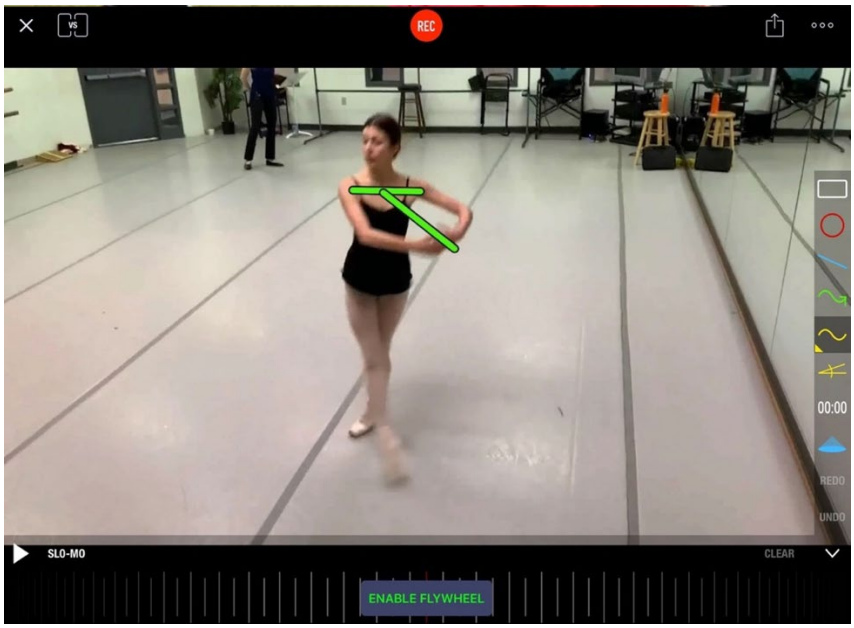

Figure 2. *Coach's Eye* user interface.

Findings

Reflective practices of students and the teacher were analyzed from the 3 interrelated units. Findings are presented in this paper for one dancer – student named Michelle, who was cast as the lead dancer in the school's upcoming ballet production. Michelle chose to work on a one-and-half-minute variation from the *Sleeping Beauty* Act I. She first practiced this variation together with other student dancers in previous weeks. In the first practice of the three analyzed in this paper, Reena planned to record the variation for analysis in *Coach's Eye*, and the practice right before the recording acted as a preparation. Reena analyzed the variation recording outside the class in *Coach's Eye*, shared the analysis clips with Michelle, and discussed them in the class the following week.

Embodied reflective practice in the studio without technology mediation

Due to the nature of ballet as an art form in which body movements play a key role, embodied reflective practices often occur in the studio limited by time (the class period) and space (the studio). For example, before the *Coach's Eye* recording, Reena provided in-class corrections, which were then practiced by Michelle during the class. Reena demonstrated a movement twice, and Michelle followed. Then, Michelle asked about that movement by saying "en pointe?..." "No." answered Reena without waiting for Michelle to finish the question. Subsequently, Michelle practiced the movement again, while Reena had moved on to the next point, "…And then you have this funky thing…". Corrections in real-time in the context of an active ballet studio with multiple dancers can be imprecise (e.g., "…you have this funky thing"), and students have little time to formulate questions. As such, the most direct way to provide just-in-time feedback is through embodied movement supplemented with verbal corrections. Students are expected to be able to apply the corrections during the next practice, which could be immediately, or after the next grouping of students has a turn. Thus, embodied reflection in the ballet studio occurs during the action, and in some cases, in a second action separated by time after corrections are provided. For example, after giving a correction, Reena suggested for Michelle to try the variation with all the corrections while rewinding the music. Michelle then quickly started to practice the last sequence of movements with which she had difficulty.

Video-analysis supported *cascading practices of* embodied reflection between students and teacher in refined and intersecting ways.

Our analyses revealed one particular nuance of using video to support reflective practice in embodied contexts – a *cascading effect* of reflective practices. By cascading, we refer to the splintering and emergent practices that occur in the studio after reflection on an embodied practice. By introducing video reflection into the ballet studio context, we found it diffracted the overall reflective environment, resulting in cascading instances of reflection based on the original video analysis of one student by an instructor. This one, initiating reflection led to new

insights for the teacher which in turn triggered new embodied reflections with students individually, across time and space, and as a collective.

This cascading effect was often found in the form of reflective dialogue and turn taking. Our data show how reflective dialogue and experimenting between Michelle and Reena influenced Michelle' learning experience, and how other dancers interacted with these reflections as well. *Coach's Eye*'s analytical functions allowed for slow motion, freeze, annotation, and voice-over comments, which gave the instructor more modalities to analyze nuanced features of a student's embodiments. The example below shows how Reena's analysis allowed her to identify the problem in Michelle's turns more precisely, which consequently triggered her own and Reena's reflective practice the following-week. During the first practice of Michelle's variation in class, Reena realized that Michelle had difficulty keeping her balance in the series of single-double pique turns. During class, she pointed out Michelle's problems in her elbow position and in the connections between turns. However, during the recording analysis after that class (Figure 3), instead of talking about the elbow position, Reena explained how Michelle's body got twisted due to the way she placed her arms. She also found the problem happened during the down-beat of each turn, rather than the up-beat which she thought was the source of the problem during class. By using the slow motion and freeze frame features of the technology, Reena could identify and analyze a more precise placement problem of Michelle frame by frame. Reena noted this directly: "You know when I was first watching it, which was great with slow-mo, (be)cause I thought it was on your entrance, it's really the coming down is the biggest culprit. You can see it more when you're coming down...". The video-analysis-technology supported reflection for both the teacher and the student.

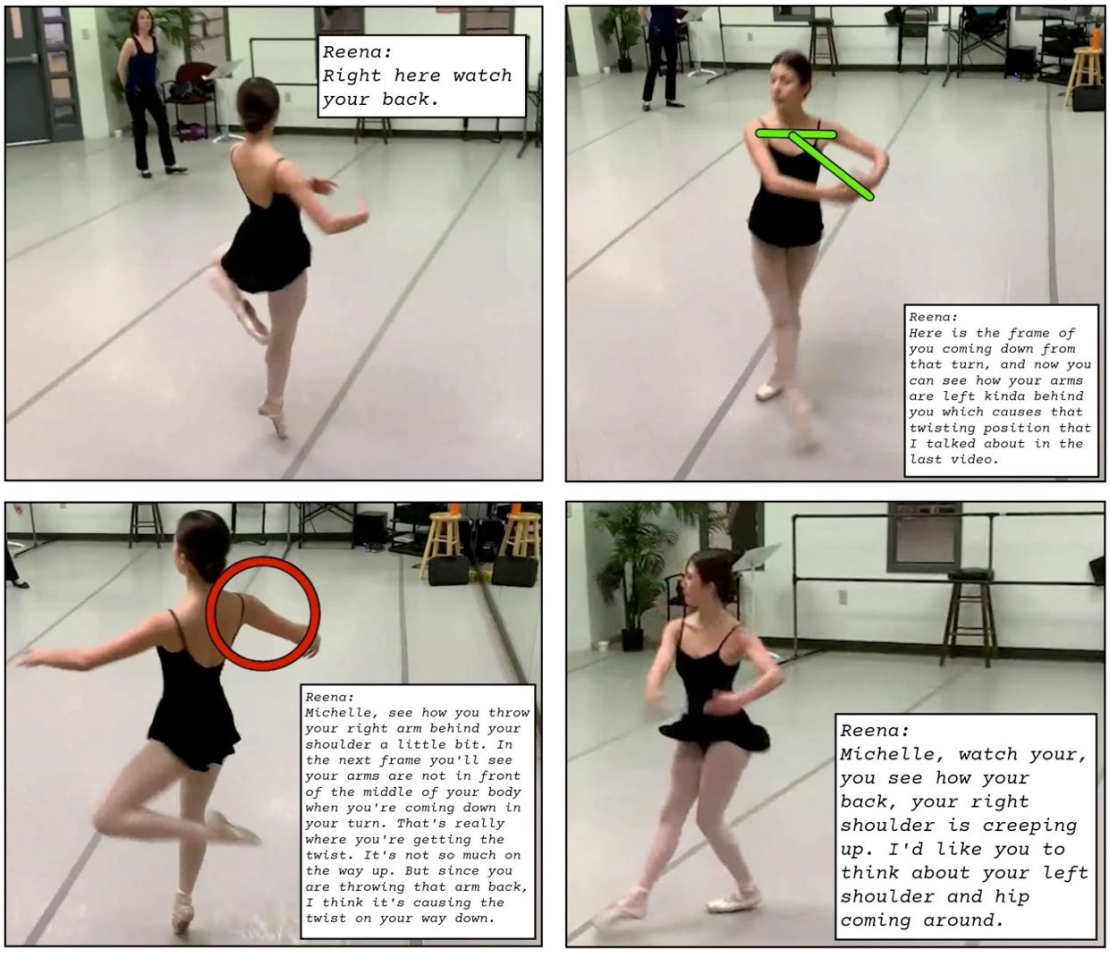

Figure 3. Reena's analyses in *Coach's Eye.*

In the embodied reflective dialogues that we observed, Reena talked verbally whereas Michelle "talked" physically. The video-recording nature of *Coach's Eye* allowed the dialogues to happen initially asynchronously. In the analysis clips, Reena talked to Michelle via voice recording about her corrections that was shared with

Michelle before class. During class the following week, Michelle talked to Reena regarding the corrections mentioned in the analysis clips. This asynchronous communication occurring initially online triggered the synchronous dialogue during the class. Michelle initiated questions several times, compared to the previous week's class where she followed what Reena said more passively.

The insights gained by Reena while watching the video led to a *series of embodied reflective dialogues* with Michelle, as shown in Figure 4. They discussed and came up with a different approach to help Michelle with the single-double pique turns based on Reena's analysis of video. Through a back-and-forth turn taking that alternated between referencing the video, verbal corrections, physical demonstration and physical correction by Reena, and practice representing the reflections by Michelle, the two worked together to understand that the driving force of the turn is from the shoulder, instead of the arms.

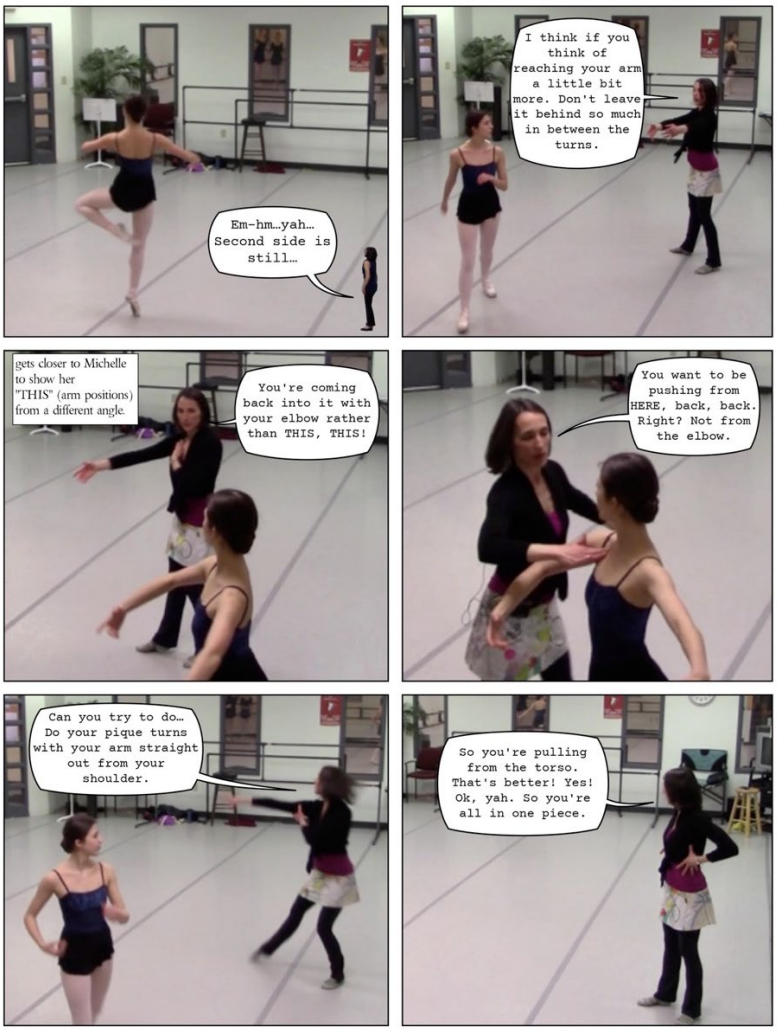

Figure 4. The embodied reflective dialogues between Michelle and Reena.

Another level of cascading effect involved the class as a *collective*. While the instructor was engaging in a reflective dialogue with Michelle, other students were watching and engaging in their own embodied reflections, based on the analyses of Michelle's at the same time (Figure 5). They were either standing and watching Reena and Michelle's movements or practicing the same movements on their own in the back of the studio. Other students' reflective practices, then, were also triggered by Michelle and Reena's reflective dialogue and practice. Their reflective practices were sometimes called out by the instructor when they were helpful for the student in the front. Further illustrating the potential of this cascading effect of reflection, the student whose practice was analyzed via *Coach's Eye* (Michelle) could then further reflect, based on what students observing peripherally did, in addition to reflecting on the instructor's comments to the other students present.

Figure 5. Students at the back engaged in their embodied reflection.

Conclusions and discussions

This study explored how the video-analysis-based technology, *Coach's Eye*, can facilitate and enhance the embodied reflective practices within a ballet teaching and learning context. It supported the teacher to highlight corrections by using slow-motion, freeze frames, annotation, and ease of rewinding. Further, this study revealed a cascading effect of reflection that led to splintering and emergent levels of reflection within the embodied context. It widens the range of context where embodied learning can be studied. These findings point to nuanced characteristics of embodied reflective practices that extend previous theory on reflection in- and on-action (Schön, 1987) and can potentially enrich the ballet pedagogy.

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