

## RESEARCH ARTICLE

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### The Impact of Video Self-Reflection on Teacher Practice

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Research suggests that teachers with increased education and experience are better able to support learners (Cowan & Goldhaber, 2015; DiCarlo, Baumgartner, Ota & Jenkins, 2015). One-time professional development trainings have been considered ineffective for creating sustained changes in practice (Andrews, Bobo, & Spurlock, 2010; Ball & Cohen, 1999; Hamre, Partee & Mulcahy, 2017; Pianta, Mashburn, Downer, Hamre, & Justice, 2008). In spite of this knowledge, most professional development in the field of education consists of workshops or single-event trainings (Garet, Porter, Desimone, Birman, & Yoon, 2001). Although noted in the literature as a powerful tool for changing practice, coaching is both labor-intensive and expensive (Early, Maxwell, Ponder, & Pan, 2017). There is a growing body of literature linking ongoing video-based professional development to improved teacher practices (Durand, Hopf, & Nunnanmacher, 2015). Self-reflection has been documented in the literature in the development of new behaviors and is the cornerstone of teacher quality initiatives (Brownell, Ross, Colon, & McCallum, 2005), such as the National Board for Professional Teaching Standards (<http://www.nbpts.org/>). The purpose was to conduct a pilot study to investigate the use of video self-reflection on the quality of interactions in the early childhood classroom.

*Keywords:* Professional Development, Self-Reflection, Classroom Assessment Scoring System (CLASS)

Video-based training provides the learner with opportunities for training on demand. Video content is accessible whenever the learner has the time. Video allows the learner to select an area of interest and watch the training repeatedly. Another more powerful use of video is for self-evaluation is when learners record their teaching and watch later to gain additional perspective through self-reflection. Previous research suggests that analysis of teacher's own practices is effective for developing reflective abilities about practice, more so than other forms of training (Borko, Jacobs, Eiteljorg, & Pittman, 2008; Nagro, de Bettencourt, Rosenberg, Carran & Weiss, 2016; Robinson & Kelley, 2007; Seidel, Stürmer, Blomberg, Kobarg, & Schwindt, 2011). The rationale for the use of video-based reflection is that it has been instrumental in considering one's

own “pedagogical practice and accessing the underlying factor that makes one able and willing to act” (Durand, Hopf, & Nunnenmacher, 2015, p.38).

Knowles, Holton, and Swanson (2005) created the *Andragogy in Practice* model to describe the principles of adult learning. They define adult learning “as the process of adults gaining knowledge and expertise” (Knowles et al., p.157). Andragogy stipulates that there are six key principles that should be considered for the adult learner; the need to know, previous foundational knowledge, readiness, orientation to learning, motivation, and self-concept (2005). Video can be a powerful tool in evaluating one’s own practice. Research suggests that teachers are better able to be self-reflective when provided with a framework (Calandra, Gurvitch, & Lund, 2008; Pianta et al., 2008; Pianta, La Paro, & Hamre, 2008).

There are several framework tools that can be used to measure quality in an early childhood setting. The Infant Toddler Environmental Rating Scale (ITERS) are used to evaluate the structural quality of the environment (Harms, Clifford, & Cryer, 2015). These tools measure interactions of children-to-adults, child-to-child, materials in the environment, the environmental space and schedule of the day. These tools assess the quality of interactions between children and adults, children with materials, and interactions within the space. Although the research is clear that higher scores on these measures lead to positive outcomes for young children (McWilliam, de Kruif, & Zulli, 2002), these tools focus more on the static (materials) and structural (scheduling) qualities of classrooms and do not provide as much detail on teacher practices (Harms, Clifford, & Cryer). In 2005, The National Center for Research in Early Childhood Education (NCRECE) with a group of researchers developed the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2005). This tool provides a theoretically and empirically supported framework developed to improve the quality of interactions between teacher and students in early childhood education settings. Concurrent to the development of the CLASS tool, the nation has placed enormous pressures on the education systems for accountability of quality early childhood programs to ensure promotion of stimulating and nurturing environments (Hamre, Goffin & Kraft-Sayre, 2009).

Existing literature reveals that both video-self-reflection and CLASS are links for growth in children and professional development support for teachers (Pianta, Mashburn, Downer, Hammer, & Justice, 2008). Specific to the current study, the term “video-based” refers to the video recordings of classrooms; the consultation process and web-based video examples as a tool for reflecting upon one’s pedagogical practice with a goal of improving social behavior. Self-reflection is an important process as it can lead to new ideas or perspectives (Fukkink & Tavecchio, 2010). The term *self-discovery* allows for personal insight into one’s character, motivations, or needs. Placing value on changed behaviors, where an individual can be empowered through self-discovery, allowing for changes to transpire. By implementing video self-reflection, teachers benefit and feel empowered, which can promote self-efficacy. When the teachers are empowered, their outlook and behavior modeling towards educating young children should shift to promoting more positive child outcomes per research.

In today’s society, technology-based virtual professional development is deemed necessary due to school budgets, time constraints, and the increasingly changing technological interventions that are in alignment with adult learning theory. Professional development, which is utilized virtually can provide cost and labor effective alternatives to traditional face-to-face coaching (Levin, 2012).

The purpose of the present study was to determine the teacher’s ability to utilize video self-reflection as a structured learning tool to enhance teaching practice while successfully

implementing virtual professional development. The study involved two tiers of professional development; Tier I included self-reflection using the CLASS tool, and Tier II included the additional component coaching in the form of video voice-over feedback. The following two research questions guided the present study: 1) How reliably teachers used video to assess their own performance using the CLASS tool as a framework (as compared to a CLASS-reliable external assessor)?; and 2.) Which condition (Tier I, video self-reflection, and Tier II, video voice-over coaching) produced the greatest increase in teacher's CLASS score?

## Setting

The study was conducted at a campus-based child care center in the south that serves children from birth through Pre-K. The program was accredited by the National Association for the Education of Young Children (NAEYC, 2017), adheres to criteria set forth in the *Infant/Toddler Environmental Rating Scale* (ITERS, 2017) and follows a Reggio Emilia-inspired philosophy in the education and development of young children. The Reggio Emilia approach is based on certain fundamental values about how children naturally learn (Edwards, Gandini, & Forman, 2012). In this approach, children co-construct their knowledge through interactions with other people and the surrounding environment, which is an essential element of Classroom Assessment Scoring System (CLASS; Pianta et al., 2005). The CLASS instrument evaluates interactions between teacher-child, rating the emotional climate and critical thinking of the interactions to improve learning and development.

## Participants

Inclusion criteria for the present study were based on the scores from the high stakes, state-mandated CLASS external evaluation observations. State-mandated external observations have been implemented for the past three years for all childcare and preschool settings. The targeted teachers exhibited the greatest need for professional development according to their CLASS scores from the external observations. Three female teachers were selected for participation in this study (see Table 1). This study received approval from the university's Institutional Review Board and informed consent was obtained from participating teachers.

TABLE 1  
Participating Teachers Demographic Information

| Teacher | Ethnicity        | Education   | Experience (Years) | Age Group     |
|---------|------------------|---|--------------------|---------------|
| Tammy   | African American | Bachelors of Science in Family & Consumer Science | 13                 | 2-3 year olds |
| Valerie | African American | Bachelors of Science in Family & Consumer Science | 7                  | 1-2 year olds |

|          |                  |   |   |               |
|----------|------------------|---|---|---------------|
| Danielle | African American | Associate of Applied<br>Science in Early<br>Childhood Education | 6 | 2-3 year olds |
|----------|------------------|---|---|---------------|

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## Instrumentation

The *Classroom Assessment Scoring System* (CLASS; Pianta et al., 2005) was used to measure teacher's classroom behavior and consists of two broad domains: *Emotional and Behavioral Support* and *Engaged Support for Learning*. The domains are divided into *Dimensions*, which provide more specific detail describing the facets of each domain. The CLASS tools rating scale consists of a Likert-type scale (1-7) with a score of 1-2 representing *low quality* teacher-child interaction, a score of 3-5 representing *mid-range quality*, which is described as a mixture of effective interactions, and a score of 6-7 representing *high quality*, which is described as teacher-child interactions which are consistently observed throughout the observation.

*The Emotional and Behavioral Support Domain* includes the dimensions of positive climate, negative climate, teacher sensitivity, regard for child perspectives and behavior guidance. Teachers who score high in this area are responsive; acknowledging children's feelings, and supporting their autonomy. *Engaged Support for Learning* includes the dimensions of facilitation of learning and development, quality of feedback, and language modeling. Teachers who score high in this area have the ability to engage in activities and language that facilitates child development.

## Observation Procedure

Researchers asked participating teachers to identify their most stressful periods of their instructional day and targeted those times for video observation. Prior to the beginning of the study, teachers were familiarized with the CLASS tool through a training overview, reviewing the CLASS materials and viewing/scoring the videos in the CLASS online library. Throughout the study, 15-minute video segments of each teacher's classroom were recorded and scored using the CLASS Toddler tool. In accordance with the CLASS tool, teachers were asked to score each video segment, making note of evidence to support their numeric scores. By utilizing video recordings for self-reflection, teachers were able to view and assess their own teacher-child interactions across CLASS's multiple dimensions, allowing for more effective reflection, learning, teaching and increased self-efficacy. The primary researcher was trained to reliability on the CLASS Toddler tool and also scored the videos, compiling evidence to support scoring.

## Study Conditions

This study consisted of two tiers: Tier I, video self-reflection, and Tier II, video voice-over coaching. Teachers moved to the more intensive tier when sufficient changes to their behaviors were not observed.

*Tier I.* In Tier I, teachers scored a 15-minute video clip. As a measure of fidelity, a trained reliable CLASS observer also scored the video. The expectation was that as teachers

became increasingly aware of the CLASS criteria by scoring their own behaviors, their instructional practices with children would change and their CLASS scores would increase. In order to determine the utility of this approach, data were collected on a weekly basis across eight months. Data were plotted for visual analysis to determine the effects of Tier I, video self-reflection, while also calculating each teacher's reliability with the primary researcher. If sufficient changes were not observed through the Tier I video self-reflection, the teacher moved to Tier II, video voice-over coaching.

*Tier II.* During Tier II, the primary researcher conducted video voice-over coaching sessions via internet after each teacher self-scored her video. The video voice-over coaching session allowed the researcher to share feedback within the teacher's current video, using Screencastomatic (2017), a software tool for recording screenshots allowing visual and verbal cues to be given for areas of strengths and areas for improvement. This low-cost, low labor-intensive intervention was intended to increase teachers' understanding of the CLASS criteria, and identify opportunities to use the recommended criteria within the context of the classroom. The nature of the video feedback allowed each teacher to view the video multiple times to observe her own interaction and hear the primary researchers' feedback. This fit within the Andragogy framework (Knowles et al., 2005), as the video allowed teachers to see opportunities within their current classroom routine to use the suggested skills.

## Data Analysis

Data from this study were analyzed using visual analysis (Kazdin, 2011) by comparing the primary researchers' CLASS scores to the teachers' scores to determine if teachers reliably scored their video and to determine if teachers were increasing their CLASS score scores through the use of video self-reflection (Tier I) or video voice-over coaching (Tier II).

## Research Design

In this study, single-subject research design was used to measure the changes in teachers' behavior and the effect of self-reflection on the teacher's CLASS scores by engaging teachers in a self-reflection process, through scoring videotapes of their teaching using the CLASS tool. Single subject studies allow individual modifications to be made, which allows for positive behavior interventions to be implemented (Kazdin, 2011). Specifically, a multiple baseline design was used to measure the impact of the intervention (Tier I or Tier II) across teachers. The multiple baseline design was practical in this study, as more than one teacher required intervention. Experimental control was demonstrated through repeated introduction of each Tier across teachers at different points in time (Kazdin, 2011). Data were collected during each phase for a minimum of five data points, as recommended in the What Works Clearinghouse: Single-Case Design Technical Documentation (Kratochwill, Hitchcock, Horner, Levin, Odom, Rindskopf, & Shadish, 2010).

## Inter-observer Agreement

The primary researchers and an additional CLASS-certified observer dually coded 22% of all observations (n= 36). Within one-point reliability was used to calculate the percent agreement per dimension across all observation sessions (Cassidy, Hestenes, Hegde, Hestenes, & Mims, 2005). Overall reliability was 93% (Range, 85-100%). Reliability data per dimension were as follows: *Positive Climate* reliability 100% (Range, 100%); *Negative Climate* reliability 100% (Range, 100%); *Teacher Sensitivity* reliability 91% (Range, 60-100%); *Regard for Child Perspective* reliability 100% (Range, 100%); *Behavior Guidance* reliability 91% (Range, 60-100%); *Facilitation of Learning* reliability 95% (Range, 60-100%); *Quality of Feedback* reliability 85% (Range, 50-100%); *Language Modeling* reliability 85% (Range, 60-100%).

## RESULTS

The researchers in the current study sought to determine if video self-reflection could impact teacher practices in the early childhood classroom. Two separate interventions were applied to determine their effect on teacher behavior. Two research questions specifically guided this study. Those questions were: 1) How *reliably* teachers used video to assess their own performance using the CLASS tool as a framework (as compared to a CLASS-reliable external assessor)? and 2.) Which condition (Tier I, video self-reflection, and Tier II, video voice-over coaching) produced the greatest *increase* in teacher's CLASS score?

### Research Question 1: Reliability

Research Question One sought to determine if teachers could reliably assess their own performance, during each Tier of the study. Reliability was calculated between the teacher and the researcher using the formula of dividing the smaller raw score by the larger raw score to calculate the percentage. Within each Tier, the teacher's reliability score for the first data point was compared to reliability for the last data point to determine each teacher's percentage point increase or decrease. Domain scores were calculated within each tier by averaging the dimension percentages for the first and last data point across all dimensions in that domain to determine each teacher's overall percentage point increase or decrease.

For Tammy, Tier I, Domain 1: *Emotional and Behavioral Support* resulted in an overall increase of seven percentage points (Table 2). Moreover, Domain 2: *Engaged Support for Learning* resulted in an overall increase of 17 percentage points (Table 3), resulting in Tammy being 100% reliable scoring the CLASS tool as compared to the researcher. For Valerie, Tier I, Domain 1: *Emotional and Behavioral Support* resulted in an overall decrease of 33 percentage points (Table 2). Moreover, Domain 2: *Engaged Support for Learning* resulted in an overall decrease of 23 percentage points (Table 3). Valerie did not reliably score the CLASS tool as compared to the researcher. For Danielle, Domain 1: *Emotional and Behavioral Support* resulted in an overall decrease of 6 percentage points (Table 2). Domain 2: *Engaged Support for Learning* remained constant with 100% reliability (Table 3), all while reliably scoring the CLASS tool as compared to the researcher.

At the end of Tier II, all of the teachers reliably scored the CLASS tool as compared to the researcher. The specific results for Tier II Domains 1 and 2 are as follows: Domain 1: *Emotional and Behavioral Support* (Table 4), resulted with Tammy overall decreasing by 6 percentage points, Valarie having an overall increase of 1 percentage point, and Danielle decreasing by 5 percentage points. In Domain 2: *Engaged Support for Learning* (Table 5), Tammy remained constant with 100% reliability, Valerie resulted in an overall decrease of 13 percentage points, and Danielle resulted in an overall decrease of 11 percentage points.

[See tables below]

TABLE 2  
Domain 1 Tier I: Teachers CLASS Scores as Compared to the Researcher

| Teacher  | Dimension-Positive |      |          | Dimension-Negative |      |          | Dimension-Teacher sensitivity |      |          | Dimension-Regard for Child |      |          | Dimension-Behavior Guidance |      |          | Domain 1-Emotional and Behavioral Support |      |          |
|----------|--------------------|------|----------|--------------------|------|----------|-------------------------------|------|----------|----------------------------|------|----------|-----------------------------|------|----------|---|------|----------|
|          | 1 <sup>st</sup>    | Last | $\Delta$ | 1st                | Last | $\Delta$ | 1st                           | Last | $\Delta$ | 1st                        | Last | $\Delta$ | 1st                         | Last | $\Delta$ | 1st                                       | Last | $\Delta$ |
| Tammy    | 100                | 100  | 0        | 100                | 100  | 0        | 67                            | 100  | +33      | 100                        | 100  | 0        | 100                         | 100  | 0        | 93  | 100  | +7       |
| Valerie  | 100                | 67   | -33      | 100                | 100  | 0        | 100                           | 60   | -40      | 100                        | 50   | -50      | 100                         | 60   | -40      | 100                                       | 67   | -33      |
| Danielle | 100                | 100  | 0        | 100                | 100  | 0        | 100                           | 67   | -33      | 100                        | 67   | -33      | 67                          | 100  | +33      | 93  | 87   | -6       |

Note.  $\Delta$ =difference

TABLE 3  
Domain 2 Tier I: Teachers CLASS Scores as Compared to the Researcher

| Teacher  | Dimension-Facilitate |      |          | Dimension-Quality of feedback |      |          | Dimension-Language Modeling |      |          | Domain 2- Engaged Support for Learning |      |          |
|----------|----------------------|------|----------|-------------------------------|------|----------|-----------------------------|------|----------|--|------|----------|
|          | 1st                  | Last | $\Delta$ | 1st                           | Last | $\Delta$ | 1st                         | Last | $\Delta$ | 1st                                    | Last | $\Delta$ |
| Tammy    | 100                  | 100  | 0        | 100                           | 100  | 0        | 50                          | 100  | +50      | 83                                     | 100  | +17      |
| Valerie  | 80                   | 50   | -30      | 100                           | 75   | -25      | 100                         | 60   | -40      | 93                                     | 70   | -23      |
| Danielle | 100                  | 100  | 0        | 100                           | 100  | 0        | 100                         | 100  | 0        | 100                                    | 100  | 0        |

Note.  $\Delta$ =difference



TABLE 4  
Domain 1 Tier II: Teachers CLASS Scores as Compared to the Researcher

| Teacher  | Dimension-Positive |      |          | Dimension-Negative |      |          | Dimension-Teacher sensitivity |      |          | Dimension-Regard for Child |      |          | Dimension-Behavior Guidance |      |          | Domain 1-Emotional and Behavioral Support |      |          |
|----------|--------------------|------|----------|--------------------|------|----------|-------------------------------|------|----------|----------------------------|------|----------|-----------------------------|------|----------|---|------|----------|
|          | 1 <sup>st</sup>    | Last | $\Delta$ | 1st                | Last | $\Delta$ | 1st                           | Last | $\Delta$ | 1st                        | Last | $\Delta$ | 1st                         | Last | $\Delta$ | 1st                                       | Last | $\Delta$ |
| Tammy    | 100                | 100  | 0        | 100                | 100  | 0        | 100                           | 100  | 0        | 100                        | 71   | -29      | 100                         | 100  | 0        | 100                                       | 94   | -6       |
| Valerie  | 67                 | 71   | +4       | 100                | 100  | 0        | 100                           | 100  | 0        | 67                         | 71   | +4       | 100                         | 100  | 0        | 87  | 88   | +1       |
| Danielle | 100                | 100  | 0        | 100                | 100  | 0        | 100                           | 100  | 0        | 67                         | 71   | +4       | 100                         | 67   | -33      | 93  | 88   | -5       |

Note.  $\Delta$ =difference

TABLE 5  
Domain 2 Tier II: Teachers CLASS Scores as Compared to the Researcher

| Teacher  | Dimension-Facilitate |      |          | Dimension-Quality of feedback |      |          | Dimension-Language Modeling |      |          | Domain 2- Engaged Support for Learning |      |          |
|----------|----------------------|------|----------|-------------------------------|------|----------|-----------------------------|------|----------|--|------|----------|
|          | 1st                  | Last | $\Delta$ | 1st                           | Last | $\Delta$ | 1st                         | Last | $\Delta$ | 1st                                    | Last | $\Delta$ |
| Tammy    | 100                  | 100  | 0        | 100                           | 100  | 0        | 100                         | 100  | 0        | 100                                    | 100  | 0        |
| Valerie  | 100                  | 100  | 0        | 100                           | 60   | -40      | 100                         | 100  | 0        | 100                                    | 87   | -13      |
| Danielle | 100                  | 67   | -33      | 100                           | 100  | 0        | 100                         | 100  | 0        | 100                                    | 89   | -11      |

Note.  $\Delta$ =difference

## Research Question 2: Change in CLASS Scores

Research Question Two sought to determine if teachers could increase their CLASS score during each Tier of the study. Tables 2-5 summarize teachers' CLASS scores as measured by the researcher across each dimension of the CLASS Toddler tool, with the exception of the Dimensions of *Positive Climate* and *Negative Climate*, as the three teachers consistently scored in the high range.

**Teacher Sensitivity.** Table 2 and Table 4 depict teacher's CLASS scores within the dimension of *Teacher Sensitivity* across Tier I and Tier II. In Tier I, Tammy's average CLASS score was 5 (range, 4 – 5). When the Tier II intervention was applied Tammy's average CLASS score increased to 6 (range, 6 – 7). This represents a 1-point increase. In Tier I, Valerie's average CLASS score was 5 (range, 5 – 6). When the Tier II intervention was applied Valerie's average CLASS score increased 6 (range, 5 – 7). This represents a 1-point increase. In Tier I Danielle's average CLASS score was 5 (range, 5 – 6). When the Tier II intervention was applied Danielle's average CLASS score increased to 6 (range, 6 – 7). This represents a 1-point increase.

**Regard for Child Perspective.** Table 2 and Table 4 depict teacher's CLASS scores within the dimension of *Regard for Child Perspective* across Tier I and Tier II. In Tier I, Tammy's average CLASS score was 5 (range, 4 – 6). When the Tier II intervention was applied Tammy's average CLASS score increased to 7 (range, 6 – 7). This demonstrates a 2-point increase. In Tier I, Valerie's CLASS score was 5 (range, 4 – 6). When the Tier II intervention was applied Valerie's average CLASS score increased to 6 (range, 5 – 7). This represents a 1-point increase. In Tier I, Danielle's CLASS score averaged 5 (range, 4 – 6). When the Tier II intervention was applied Danielle's average CLASS score increased to 7 (range, 6-7). This represents a 2-point increase.

**Behavior Guidance.** Table 2 and Table 4 depict teacher's CLASS scores within the dimension of *Behavior Guidance* across Tier I and Tier II. In Tier I, Tammy's average CLASS score was 5 (range, 4 – 6). When the Tier II intervention was applied, Tammy's average CLASS score increased to 6 (range 6-7). This represents a 1-point increase. In Tier I, Valerie's average CLASS score was 5 (range, 4 – 6). When the Tier II intervention was applied Valerie's average CLASS score increased to 6 (range, 5 – 6). This represents a 1-point increase. In Tier I, Danielle's average CLASS score was 6 (range, 4 – 6). When the Tier II intervention was applied, Danielle's average CLASS score increased to 7 (range, 6 – 7). This represents a 1-point increase.

**Facilitation of Learning.** Table 3 and Table 5 depict teacher's CLASS scores within the dimension of *Facilitation of Learning* across Tier I and Tier II. In Tier I, Tammy's average CLASS score was 5 (range, 5-6). When the Tier II intervention was applied Tammy's score increase to 6 (range, 5-6). This represents a 1-point increase. In Tier I, Valerie's average CLASS score was 5 (range, 4 – 7). When the Tier II intervention was applied Valerie's average CLASS score increased to 6 (range, 5 – 6). This represents a 1-point increase. In Tier I, Danielle's average CLASS score was 5 (range, 5 – 6). When the Tier II intervention was applied Danielle's average CLASS score increased to 6 (range, 5 – 6). This represents a 1-point increase.

**Quality of Feedback.** Table 3 and Table 5 depict teacher's CLASS scores within the dimension of *Quality of Feedback* across Tier I and Tier II. In Tier I, Tammy's average CLASS

score was 4 (range, 4 -5). When the Tier II intervention was applied Tammy's average CLASS score increased to 5 (range, 4 – 6). This represents a 1-point increase. In Tier I, Valerie's average CLASS score was 4 (range, 3 – 4); when the Tier II intervention was applied Valerie's average CLASS score was 4 (range, 3 – 5). Valerie's average CLASS score between Tier I and Tier II remained constant. In Tier I, Danielle's average CLASS score was 4 (range, 3 – 6). When the Tier II intervention was applied Danielle's average CLASS score was 4 (range, 3 – 5). Danielle's average CLASS score between Tier I and Tier II remained constant.

*Language Modeling.* Table 3 and Table 5 depict teacher's CLASS scores within the dimension of *Language Modeling* across Tier I and Tier II. In Tier I, Tammy's average CLASS score was 4 (range, 2 – 5). When the Tier II intervention was applied Tammy's average CLASS score increased to 5 (range, 4 – 6). This represents a 1-point increase. In Tier I, Valerie's average CLASS score was 4 (range, 3 – 5). When the Tier II intervention was applied, Valerie's average CLASS score was 5 (range, 3 – 6). This represents a 1-point increase. In Tier I, Danielle's average CLASS score was 5 (range, 4 – 6). When the Tier II intervention was applied, Danielle's average CLASS score was 5 (range 5 – 5). Danielle's average CLASS score between Tier I and Tier II remained constant.

## DISCUSSION

The general premise of this study was to determine if teachers could reliably engage in video self-reflection when provided with a framework to increase their CLASS scores. Findings from this study echo the literature in the demonstration of the positive benefits of the use of video self-reflection with the CLASS tool, as they are both the CLASS tool and self-reflection are linked to growth in children and professional development support for teachers (Stuhlman, Hamre, Downer & Pianta, 2015; Pianta, Mashburn, Downer, Hammer, & Justice, 2008).

During Tier I and Tier II, the teachers were video recorded at random, in 15-minute increments at least once during the week, unless circumstances prohibited. The videos consisted of the teachers interacting with the children during breakfast, whole group, centers, or music and movement. The rationale for non-scheduled videotaping was to garner an accurate portrayal of the classroom as experienced by the child. Throughout the study, the teachers made comments on the unscheduled nature of the observations. One teacher expressed her preference for non-scheduled visits stating that although she "... was not expecting to [be videotaped] today [and she was] glad ... because [the researcher was] able to see what I do every day." Another teacher expressed a similar sentiment, remarking that, "It was not that bad. Sometimes I did roll my eyes when [the researcher] came in with the camera; but it was worth it. It was better not knowing when [she was] coming as I was not stressed all week knowing that I was going to be observed on a certain day.", while another stated, "...when we know we are going to be observed we worry all week about what we are going to do."

Anecdotally, the present study appeared to provide positive professional growth and collaboration among the participating teachers. During the video recording for Tier I, the researcher overheard the three teachers talking with their instructional support director about the video recordings. One of the comments being expressed was the teachers' "enjoy[ment] in watching each other's [videos] and talking about the videos." Cherrington and Loveridge's (2014) research suggest that, "...video and collective dialogues are useful professional learning tools for

teachers to examine and improves their teaching, structural, and relational challenges...” (p. 1). In this study, the teachers created a scenario similarly seen within *My Teaching Partner* (Pianta et al., 2008) a costly coaching component of CLASS, which recognizes the need for a community of support. The teachers in this study created their own community of support by viewing each other’s video observations and discussing their practice and interactions with the CLASS tool.

By the end of Tier II, all the teachers reliably assessed their performance through video self-reflection using the CLASS framework and video voice-over coaching and were able to *produce reflection* (Cherrington & Loveridge, 2014). The teachers’ scores did not decrease as they were able to process, understand and view perspectives that were used to improve their teaching practices. Of the three teachers, one teacher was not reliable by the end of Tier I. However, she was reliable with the researcher in her scoring of the CLASS Toddler tool with video voice-over coaching in Tier II. Through the video voice-over, the coach was able to provide more specific information on which teaching practices to use and in which routines and activities within the classroom. This type of feedback in alignment with adult learning theory which recognizes that learning is intertwined and adult development occurs across multiple dimensions with learning experiences (Knowles, Holton & Swanson, 2005).

Access to video self-reflection and video voice-over coaching allowed the teachers to reflect on interactions, curriculum implementation, peer interactions and relationships in the videos while matching the experience to dimensions for scoring within the CLASS framework (Calandra, et al., 2008), which lead to gains in reliable scoring of the tool. However, research suggests there may be dangers associated with not having an external perspective as one could “fail to lead to an improvement in pedagogical practice and process quality” (Durand, et al., 2015, p. 38). The video voice-over coaching during Tier II provided teachers with an external perspective. Teachers were instructed to watch the video voice-over and email any questions or comments to the researcher for further discussion.

The Tier II interventions led to an increase in performance along with positive comments from the teachers, including the flexibility of watching the videos repeatedly and at their convenience. One teacher expressed, “I am learning more and want to continue to learn more. I see what I could have done here or there.” She also mentioned, “I score myself a 3 because I see where I need to improve... [on] scaffolding and ... more small group activities.” These comments support the notion that the video feedback helped teachers to reflect on their practice and recognize where they needed to make improvements.

Consistent with previous literature, evidence from the present study validated that when teachers are given explicit instructions their skills increased (Fukkink & Tavecchio, 2010). Additionally, teacher attitudes toward behavior change appeared to have been impacted. Comments during Tier II, indicated that teachers were more comfortable with the process.

This study echo’s Lamkin’s (2015) research, which found that, although uncomfortable, teachers viewed video self-reflection to be a valuable tool in spite of discomfort. The teachers in this study commented they were uncomfortable being videoed and seeing how they looked on camera, but the benefits they received outweighed their discomfort.

## Limitations

The teacher observations could be viewed as a limitation, as we did not adhere to the CLASS requirements of conducting three 20-minute observations. This was due to scheduling conflicts.

The threats to internal validity include availability and function of the technology equipment, which prohibited videotaping on some days. Furthermore, obtaining the personnel and resources needed to consistently video record teacher behavior proved to be challenging and limited our ability to collect data at different times of the day. Time was also a limitation. Some teachers had difficulty finding the time to score the videotapes, as this type of professional development was new to them.

## Future Research

Future research could include a third tier, face-to-face coaching, to examine if face-to-face coaching could further impact teachers' performance in the Instructional Domain of the CLASS tool. Moving through the tiers outlined in this study would ensure that face-to-face coaching, which is the most time intensive and costly intervention, would be reserved for those needing this higher level of support. Additional research could investigate if gains made through the present study were maintained over time. Because the study ended in Tier II, video voice-over coaching, we cannot say with certainty if the gains maintained in the absence of continued video voice-over feedback. Anecdotally, the center found that this mechanism of professional development produced the desired effect and has continued this practice on a monthly basis.

Although not the focus of the present study, the shift in teacher's perspective about the process of evaluation is also noteworthy, suggesting that this process may have contributed to teachers' increased motivation to focus on skill development. Participation in this study appeared to impact teachers' personal value of their practice, self-worth and feelings, as noted by one teacher who stated that she, "... really enjoyed [watching the videos] and learned a lot and would like to continue." Furthermore, another teacher expressed her desire to continue learning after the completion of the study, "I am taking a [workshop on the] CLASS [tool] so I can learn more. This has prompted me to want to learn more."

## CONCLUSION

In this study, teachers became increasingly aware of the CLASS Toddler tool criteria through the viewing of their videos. This impacted both their reliability in scoring and increased CLASS scores. Consistent with previous research, results of this study suggest that teachers benefited from reflection when given a framework for reflection (Durand, Hopf, & Nunnenmacher, 2015). This study contributes to the body of literature that suggests that these methods are consistent with the needs of adult learners (Knowles, 1984; Knowles et al., 2005). Programs striving to meet the demands of developing a well-trained staff on a limited budget might consider using video recording and reflection as part of their overall professional development plan.

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