Australian Journal of Teacher Education

Volume 47 | Issue 6 Article 6

2022

An Appraisal of the CLASS Instrument as an Observational Measurement Tool for Evaluation of Student and Teacher Interactions in Western Australian Classrooms

Gillian Kirk
Edith Cowan University

Marianne J. Knaus
Edith Cowan University

Shane Rogers
Edith Cowan University

Recommended Citation

Kirk, G., Knaus, M. J., & Rogers, S. (2022). An Appraisal of the CLASS Instrument as an Observational Measurement Tool for Evaluation of Student and Teacher Interactions in Western Australian Classrooms. *Australian Journal of Teacher Education, 47*(6).
http://dx.doi.org/10.14221/ajte.2022v47n6.6

An Appraisal of the CLASS Instrument as an Observational Measurement Tool for Evaluation of Student and Teacher Interactions in Western Australian Classrooms

Gillian Kirk
Marianne Knaus
Shane Rogers
Edith Cowan University

Abstract: The National Quality Framework is used across Australia to drive quality improvement in early childhood settings. Unique to Western Australia, the National Quality Standard is also used in schools to improve quality in classrooms up to Year two (seven to eight years). However, the literature suggests the National Quality Standard is too broad with an emphasis on quantifiable program features (structural quality). As the Classroom Assessment Scoring System (CLASS™) instrument was designed to measure classroom interactions (process quality), the purpose of this current study was to examine its efficacy in Pre-primary (five-year-old) classrooms. A mixed-method research approach was employed to appraise the CLASS instrument as an observational measurement tool for evaluation of quality student and teacher interactions in schools. The quantitative methods involved a statistical analysis of the CLASS instrument ratings and observations and interviews provided a qualitative perspective. Study conclusions suggest that while CLASS offered useful descriptions of quality in Emotional Support and Classroom Organisation, the Instructional Support scores were not consistent with other indicators of quality, and this score was not representative of the instructional quality in some classrooms.

Keywords: CLASS, student and teacher interactions, child and teacher interactions, National Quality Standard, quality, early childhood, pedagogical approaches

Introduction

There is consensus in the literature on the importance of quality early childhood education. In addition to economic return, the positive academic and life trajectories for individuals are well established (Heckman, 2011). In Australia, quality is measured by the National Quality Framework (NQF) (Organisation for Economic Co-operation and Development [OECD], 2016). The National Quality Standard (NQS) is a regulatory tool and is one part of the NQF designed to drive continuous improvement in Early Childhood Education and Care (ECEC) programs outside the schooling sector (Siraj et al., 2019). The Western Australian Education Minister gained permission to use a modified version of the NQS in schools from Kindergarten (four-year-old programs) to Year 2 (xx xx). Hence, the NQS is used to set a benchmark and quality improvement in Pre-primary (five-year-old)

classrooms, which is the year group examined in this current study. At present, Western Australia (WA) is the only context to implement the NQS in schools.

In 2008, the Council of Australian Governments signed a National Partnership agreement on the National Quality Agenda for Early Childhood Education and Care, with the intention of developing a national vision for improving quality outcomes for young children. As part of this agreement the NQS was established, providing quality areas and standards against which ECEC services were assessed and rated (ACECQA, 2020). ECEC use these quality areas to monitor and improve quality. In services outside of school, the centre (including family day care) quality is assessed by an external authorised officer using the NQS Assessment and Rating Instrument (ACECQA, 2020). Like CLASS (Pianta et al., 2008), all authorised officers for the NQS undergo training that involves ongoing professional development, a 'reliability test' and 'drift testing' (ACECQA, n.d.). Depending on the quality observed, the centres are given an overall rating of either Significant Improvement Required, Working Towards NQS, Meeting NQS, or Exceeding NQS (ACECQA, 2020, p. 4). The consequent ratings indicate progress in quality improvement and inform strategic direction for future policy and practice (Thorpe et al., 2021).

The NQS sets a national benchmark for the quality of ECEC services, both within schools and outside school services. However, research suggests it may provide a broad view of quality with an emphasis on structural features (Siraj et al., 2019). Furthermore, the notion that process quality is a multidimensional and value-laden concept constructed from an individual's philosophical and theoretical beliefs, has prompted this current research (Cadima et al., 2020). We aimed to investigate the efficacy of the Classroom Assessment Scoring System (CLASS) instrument as an observational measurement tool of student and teacher interactions in the unique context of Western Australian classrooms (Pianta et al., 2008).

Literature Review

Notions of Quality in Childhood

As quality is a multifaceted and value laden term, there is rarely one universally accepted definition (Fenech et al., 2020; Tonge et al., 2019). There is, however, a greater consensus on *why* there is an increased focus on quality in early childhood education and care (ECEC). Specifically, quality ECEC aims to provide improved educational and developmental outcomes for children and close the gap on socioeconomic disadvantage (Australian Children's Education and Care Quality Authority [ACECQA], 2020). There are two widely recognised categories of quality in ECEC settings, structural and process quality (Tayler et al., 2013).

Structural quality focusses on quantifiable features of ECEC settings including the organisation of the ECEC settings, and features such as staff qualifications, group size, staff–child ratio, room sizes, physical environments both indoor and outdoor, health and hygiene practices, and materials available (Siraj et al., 2019). In contrast, process quality centres on a child's everyday lived experiences in the setting, chief amongst these are the opportunities and interactions between the educators and the other children available within a setting, and children's accessibility to materials (Siraj et al., 2019).

There is a growing body of literature contending structural quality is important as it supports effective process quality. For example, Slot et al. (2018) state structural features of classrooms are a precondition for process quality; it is this process quality that is strongly associated with the prediction of children's concurrent and future developmental outcomes (Siraj et al., 2019; Slot et al., 2018; Sokolovic et al., 2021). Aguiar and Aguiar (2020) noted process quality predicted children's linguistic, cognitive and social development suggesting

because of this, process quality has become the main goal of most quality improvement programs.

Quality Measurement Instruments

There is a vast range of quality measurement instruments designed to assess or monitor quality in ECEC; however, in this paper we will review the Classroom Assessment Scoring System (CLASS) and the National Quality Standard (NQS). While CLASS is an American based program, it is widely known for its ability to assess process quality and for this reason has been the instrument of choice for many Australian studies, with the most extensive being the E4Kids longitudinal study involving over 2,500 children in early childhood education and care (e.g., Tayler et al., 2016). An examination of the NQS is essential as its use is mandated by Government. Table 1 provides a comparison between the NQS and CLASS. This table demonstrates what Siraj et al. (2019) state when they say the NQS has a greater emphasis on structural than process quality. However, it also establishes how the structural quality indirectly supports process quality. Both the NQS and CLASS were designed to drive continuous quality improved for better outcomes for children (ACECQA, 2020; Pianta et al., 2008).

	National Quality Standard	CLASS (all process quality)
NQS process quality	**Quality Area 1: Educational program and practice:** focuses on ensuring that the educational program and practice of educators are child-centred, stimulating and maximise opportunities for enhancing and extending each child's learning and development.	**Emotional Support:** *Teacher sensitivity:* Teachers' awareness of and responsivity to children's academic and emotional concerns. *Regard for Student Perspectives:* The degree to which teachers' interactions with children and classroom activities place an emphasis on children's interests, motivations, and points of view. **Classroom Organisation:** *Productivity*: How well the classroom runs with respect to routines and the degree to which teachers organise activities and directions so that maximum time can be spent in learning activities. **Instructional Support:** *Quality of Feedback:* How teachers extend children's learning though their responses to children's ideas, comments and work.
NQS structural quality supporting process quality	**Quality Area 2: Children's health and safety:** reinforces children's right to experience quality education and care in an environment that provides for their health and safety. Educators support this when they promote each child's wellbeing and healthy lifestyle, and support each child's growing competence, confidence and independence.	**Emotional Support:** *Positive Climate:* The emotional connection, respect, and enjoyment demonstrated between teachers and children and among children *Teacher sensitivity:* Teachers' awareness of and responsivity to children's academic and emotional concerns.
NQS structural quality supporting process quality	**Quality Area 3: Physical environment:** focuses on the physical environment. The physical environment is critical to: • contributing to children's wellbeing, creativity and developing independence • providing a diverse range of experiences that promote children's learning and development • keeping children safe • creating/organising spaces to reduce the risk of injury (ACECQA, 2020, p. 180)	**Classroom Organisation:** *Productivity*: How well the classroom runs with respect to routines and the degree to which teachers organise activities and directions so that maximum time can be spent in learning activities.
NQS structural quality supporting process quality	**Quality Area 4: Staffing arrangements:** focuses on the provision of qualified and experienced educators who develop warm, respectful relationships with children, create predictable environments and encourage children's active engagement in the learning program.	**Emotional Support:** *Positive Climate:* The emotional connection, respect, and enjoyment demonstrated between teachers and children and among children
NQS process quality	**Quality Area 5: Relationships with children:** focuses on educators developing responsive, warm, trusting and respectful relationships with children that promote their wellbeing, self-esteem, sense of security and belonging (ACECQA, 2020, p. 228)	**Emotional Support:** *Positive Climate:* The emotional connection, respect, and enjoyment demonstrated between teachers and children and among children *Teacher sensitivity:* Teachers' awareness of and responsivity to children's academic and emotional concerns. *Regard for Student Perspectives:* The degree to which teachers' interactions with children and classroom activities place an emphasis on children's interests, motivations, and points of view.
NQS process quality	**Quality Area 6: Collaborative partnerships with families and communities:** focuses on supportive, respectful relationships with families which are fundamental to achieving quality outcomes for children. Community partnerships that are based on active communication, consultation and collaboration also contribute to children's inclusion, learning and wellbeing.	No CLASS comparison

NQS structural quality supporting process quality	**Quality Area 7: Governance and leadership:** focuses on effective leadership and governance of the service to establish and maintain quality environments for children's learning and development. Effective leaders establish shared values for the service that reflect the service context and professionalism and set clear direction for the service's continuous improvement. Governance refers to the systems in place to support effective management and operation of the service, consistent with the service's statement of philosophy.	No CLASS comparison

Table1: Comparison between NQS and CLASS

CLASS

The CLASS observation instrument was designed by Pianta et al. (2008) to assess classroom quality. It is based on an accumulation of theory and empirical evidence about the classroom interactions that are most effective for promoting children's social and academic development (Hamre, 2014). Research has consistently indicated that positive teacher–child relationship predicts higher academic and social competencies (Burchinal et al., 2010; Hamre, 2014; Sutherland et al., 2018). Additionally, these contribute to the process quality that is recognised as predictive of children's developmental outcomes (Siraj et al., 2019; Sokolovic et al., 2021).

The CLASS instrument is reported as a well validated tool (Cloney et al., 2016; Pianta et al., 2008) and has been utilised to measure quality in multiple studies (for example, Cloney et al., 2016; Thorpe et al., 2020; Ying Hu et al., 2017). While benefits of this tool were noted, there are certain limitations to the tool. For example, Thorpe et al. (2020) found across 2306 Australian Kindergarten (age 3–4 years) through Year 2 (age 7–8 years) classrooms a decline in instructional, organisational and emotional support across the ECE day (8am to 4pm) with recovery in emotional support at the end of the day. These variations across time periods and content systematically biased CLASS scores, with the researchers suggesting that certain times of the day and particular events in early childhood programs may serve as barometers of quality. Additionally, there is a growing number of studies utilising CLASS that have noted consistently lower Instructional Support scores (e.g., Cloney et al., 2016; Ying Hu et al., 2017). Ying Hu et al. (2017) noted that even with support, the most effective teachers could only attain mid-range scores in this domain. Findings such as these raise the possibility the limitation is with the CLASS tool in measuring Instructional support, and not the teachers.

Burchinal et al.'s (2016) meta-analysis study suggests moderate to high-quality range instructional support quality need to be maintained to be associated with gains in child outcomes, hence these lower scores need further examination. A study conducted by Tayler et al. (2013) of 250 preschool classrooms using two measures of ECEC quality, the CLASS and selected subscales of the ECERS-R, found that Australia slightly outperformed the United States in the areas of classroom organisation and instructional support.

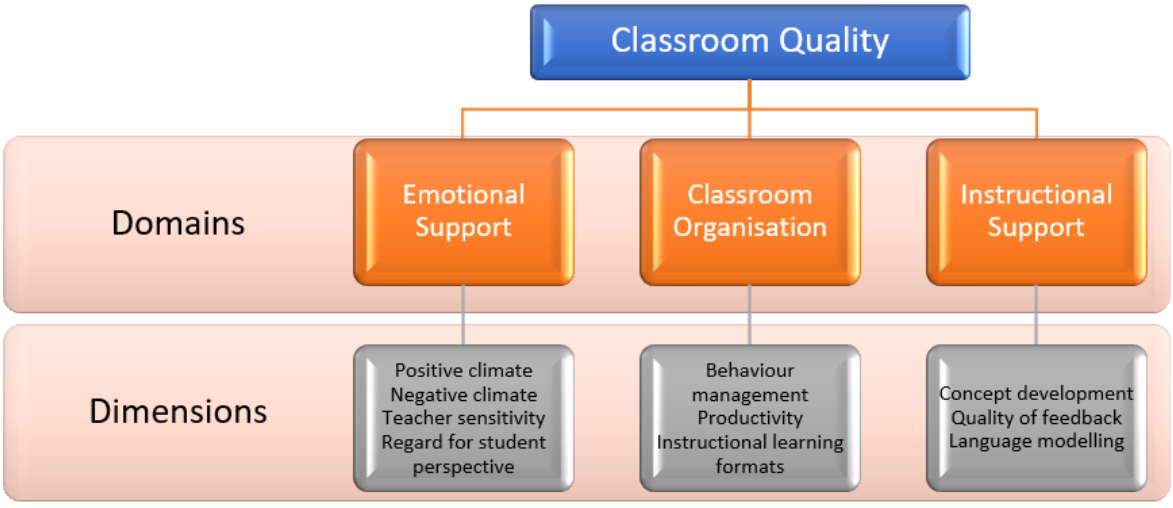

Figure 1. Overview of CLASS domains and dimensions (Pianta et al., 2008, p. 2).

The CLASS instrument is organised into domains, dimensions, indicators, and behavioural markers that focus on interactions between teachers and children and what materials (see Figure 1).

All three CLASS domains are important in children's learning and while the CLASS instrument will result in domain specific scores, Williford et al. (2013) found all three domains demonstrate a certain level of interdependence. Williford et al. (2013) examined individual-level and classroom-level patterns of quality and how they predicted school readiness. They concluded that across the 309 United States Head Start and community-based pre-school classrooms involved in their study, a teacher's overall responsivity relates to gains in pre-schoolers' school readiness.

National Quality Standard

In a study conducted by Siraj et al. (2019) they examined the associations between the NQS and two research-based quality rating scales, the Sustained Shared Thinking and Emotional Wellbeing (SSTEW) and Early Childhood Environment Rating Scale—Extension (ECERS-E) (Siraj et al. 2015; Sylva et al. 2003). In comparison to the other two scales, Siraj et al. (2019) state the NQS has a broader focus on quality with a greater emphasis on structural and regulatory compliance. They suggested the NQS ensures a minimum threshold of quality, however a combination of the three scales would potentially further extend this base level of quality. In our literature search, we could not find a similar study examining the associations between the NQS and CLASS.

Examining Australian services rated Working Towards and those Meeting or Exceeding through an analysis of two discrete datasets, the ACECQA snapshots providing service data and the Early Years Workforce Study data on educators and educator experience, Thorpe et al. (2021) identified distinguishing structural characteristics and relational factors within services rated Working Towards. Thorpe et al. concluded that educator wellbeing and conducive work conditions support quality ECEC provision. Hence educators' work conditions should be an immediate focus for policy and practice. Phillips (2020) examined five long day care (LDC) services rated as Exceeding the NQS and found a dichotomy between educators' perceptions of the NQS. While they recognised its contribution to quality improvement, they also considered it as "adversely affecting quality ECEC" (p. iv) due to demanding expectations and the onerous documentation requirements that was found to impede on quality interactions with children. This may have also contributed to the stressors identified in Thorpe's et al. (2021) study. Phillips (2020, p. iii) noted there is limited research on the perceived reliability and usefulness of the NQS, and the impact it has on educators' knowledge and practice.

It is acknowledged that research on the reliability of the NQS in services outside of school is limited (Phillips, 2020), however, research on the reliability of NQS in school settings is even more scarce. In WA schools, Kindergarten to Year 2 are assessed by the school principal and public schools can nominate to have their ratings verified by qualified members from the Department of Education WA. The ratings applied to schools are 'working toward' and 'meeting', and thus far, these ratings are not used as high-stakes currency (Simpson, 2010). While there is no literature on the reliability of the rating process in schools, previous studies have examined how the act of implementing the NQS in schools has prompted teachers to think more critically about their practice (xx & xx, 2018; xx & xx, 2021). These studies highlight that even if there is a greater emphasis on structural and regulatory processes as noted by Siraj et al. (2019), the NQS has the potential to promote

improvements in process quality by encouraging teachers to reflect more broadly and deeply on classroom factors that were possibly unconsidered before.

This literature review examined agreed upon terms of quality in ECEC and how these were explained in the literature. Two key categories of quality were identified, structural and process. Structural process supported effective process quality, which was considered predictive of children's concurrent and future developmental outcomes. The CLASS and NQS instruments were reviewed and while NQS examines structural and process quality, CLASS focuses exclusively on process quality. The NQS was reported to provide a broad focus on quality with an emphasis on structural and regulatory compliance. The purpose of this study is to examine the possibility of using the CLASS instrument to complement the NQS in its examination of process quality in Pre-primary settings.

Research Design

Description of Study

The literature review highlighted the importance of ECEC quality and indicated that minimal studies have been conducted in the unique context of Western Australian school based ECEC programs where schools are mandated to use the NQS to improve quality. Considering this, the current study was designed to answer the following research question:

1. How does the CLASS instrument evaluate quality in Western Australian school ECEC programs?

A mixed-method approach was employed to collect data to answer these questions. Mixed methods enable a rich examination of the research question as it invites viewing the phenomena from different perspectives (Regnault et al., 2018). The quantitative perspective taken by this study involved a statistical analysis of the CLASS K-3 instrument ratings (Pianta et al., 2008) taken in seven classrooms. The qualitative methods of observations and interviews gave words and meaning to the numbers (Busetto et al., 2020). Ethics for this research was approved by the University (2019-00030), and consent was given by principals, teachers, and parents. The researchers' presence was explained to the children in each classroom by both their parents and the researchers.

Data Collection Instruments

This study gathered data using three research instruments: the CLASS K-3 observation instrument, observations and semi-structured interviews. This triangulation of data can provide multiple perspectives and insights into the phenomena.

The CLASS observation instrument

The CLASS instrument was utilised to observe teacher and student interactions as these are viewed as the "primary mechanism of student development and learning" (Pianta et al., 2008, p. 1). CLASS is an observational instrument developed to assess classroom quality in K-3 classrooms. Specifically, the CLASS Manual K-3 is an age specific manual for the five-year old to eight-year-old age group providing a more targeted description of the CLASS domains of Emotional Support, Classroom Organisation and Instructional Support. The researchers making the CLASS observations had active CLASS observer certification for the K-3 age range (Teachstone, n.d.) and had passed a CLASS reliability test. This test requires observers to rate similarly, thus supporting consistent ratings. To further increase cross observer reliability and reduce bias, both observers made ratings at the same time to ensure cross.

The researchers observed classroom interactions for a prescribed period (15 to 30 minutes) while taking detailed fieldnotes about specific teacher and student behaviours and interactions. CLASS observations for each classroom were taken over one day (total seven days), and the observation timed intervals per class ranged between four and six (see Table 1 for more detail). The researchers then used the set of rating scales from the CLASS manual to determine the final code for each dimension.

Semi-Structured Interviews

Informal semi-structured interviews were conducted with teachers after the CLASS observations had taken place. The interviews ascertained how they developed quality learning environments. Informal interviews were deliberately chosen as they put the participant at ease (Swain & Spire, 2020). This was particularly important as these teachers had been closely observed for much of the day.

The researchers discussed the observations with the teachers using a set of open-ended questions on the quality of student learning, such as "What factors do you believe support student learning?", "What does quality interactions look like in your classroom?" and "Can you explain what informs your planning?". The interviews were flexible to allow the teachers to elaborate on the indicators found in the observations. Teacher responses were recorded in fieldnotes by both researchers present, and the recorded responses were clarified with the teachers. Additionally, member checking of the interview responses further reduced the possibility of misinterpretation, hence improving reliability.

Participants

Pre-primary teachers and students were invited to participate in this study. In WA, Pre-primary is the first year of compulsory schooling, and this year is pivotal in children's school lives as it sets their expectations for future learning and their perceived success in learning.

Three Independent private schools, and seven Pre-primary teachers agreed to participate in this study. A total of 139 five-year-old children were given consent by their parents to participate. This was a sample of convenience where schools were known to be interested in quality education, and ethics was attainable. The teacher participation is summarised in Table 2 (below).

School (S)	Participating teachers (pseudonyms)	Number of children	CLASS ratings (number of timed observations)
S1	Kaye	24	Five 20 minutes and one 10 minutes
	Kelly	25	One 30 minutes, two 20 minutes, two 10 minutes, and one 15 minutes
	Amber	22	Five 20 minutes and one 15 minutes
S2	Trish	15	Two 30 minutes, one 20 minutes and two 10 minutes
	Jess	15	Two 20 minutes, one 30 minutes and one 10 minutes
S3	Shaye	13	Four 20 minutes and one 30 minutes
	Elise	15	Three 30 minutes, one 20 minutes and one 5 minutes (cut short for break)

Table 2. Participants captured in this report

Data Analysis

Quantitative data were analysed using the CLASS instrument and these were aggregated across cycles, observers, and observation visits to form variables at the classroom level. Descriptive statistical information is drawn from CLASS including means, standard deviations, and correlation coefficients among observed classroom interaction variables.

Qualitative data were analysed through observations and interviews. The CLASS domains were used to guide observations to ensure the complexities of the classroom were captured. These observations were then examined to identify descriptors of classroom quality, which were grouped into themes that could explain how CLASS evaluates quality in early childhood classrooms. These themes were then compared with the quality indicators present in the NQS (ACECQA, 2020). Refer to Table 1 to see the alignments between CLASS and the NQS.

Data from the semi-structured interviews were identified, coded, and analysed using themes identified in the NQS (ACECQA, 2020). Thematic analysis enables researchers to refine the data, identifying broad patterns that subsequently enable them to conduct more fine-grained research. The analysis follows Braun and Clarke's (2007) five steps of reading and re-reading transcripts, developing a list of initial codes into meaningful groups, sorting and collating into relevant themes in Quality Areas of the NQS and reviewing, and refining the themes and then checking for problematic data and moving into sub-themes.

Findings

Data derived from the CLASS instrument, observations, and teacher interviews are reported in this section. First, data collected using the CLASS instrument is explained. To assist in reading the data, a table describing the CLASS ratings is provided (Table 3). Table 4 presents the composite CLASS scores across the three schools and Figure 1 provides a clear comparison on how each teacher scored in each domain. The data from Cloney et al.'s (2016) study provided reference scores for comparison with a larger Australian study that had a dataset of 2,494 five-year-old children enrolled in 421 ECEC classrooms.

CLASS Instrument Ratings

Class ratings fall within three ranges (low, middle, high) and across seven levels (see Table 3). To obtain an overall composite score, individual cycle scores for each dimension are averaged across the number of cycles of observations completed (Pianta et al., 2008). In this study, the scores are reported in domains (Emotional Support, Classroom Organisation and Instructional support) which is an average of each corresponding dimension score.

Low range		**Middle range**			**High range**	
1	2	3	4	5	6	7
All or almost all relevant indicators in the low range are present.	Mostly low range with one or two indicators that are mid-range.	Mostly mid-range with one or two indicators in the low range.	All or almost all relevant indicators in the mid-range are present.	Mostly mid-range with one or two indicators in the high range.	Mostly high but with one or two indicators in the mid-range.	All or almost all indicators in the high range are present.

(Table adapted from Pianta et al., 2008, p. 17)

Table 3. CLASS range descriptions

The average CLASS scores of the seven participants during observation cycles are represented numerically in Table 4. These scores are juxtaposed by the scores examined in the Cloney et al. (2016) study, providing a line of comparison against a larger scale study. Refer to Table 3 to gain an understanding as to whether composite scores and range of scores across the observations are low, mid-, or high.

	School 1			**School 2**		**School 3**				**Cloney et al. (2016)**
	Kaye [6]	Kelly [6]	Amber [6]	Trish [5]	Jess [4]	Shaye [5]	Elise [4]	Total	ICC	Reference scores
Composite CLASS scores										
ES	5.5 (0.7) 4.8-6.3	5.8 (0.4) 5.3-6.3	4.6 (0.6) 3.5-4.8	5.9 (0.4) 5.3-6.0	5.3 (0.4) 4.8-5.5	4.0 (0.3) 3.5-4.3	5.3 (0.9) 4.3-5.3	5.2 (0.7) 4.0-5.9	0.54	5.46 (0.73) 2.6-7
CO	5.5 (0.6) 4.7-6.0	5.4 (0.8) 4.0-6.0	3.7 (1.0) 2.7-5.3	4.6 (0.4) 4.3-5.00	4.1 (0.8) 3.0-5.0	2.9 (0.6) 2.0-3.7	4.8 (0.4) 4.3-5.3	4.4 (0.9) 2.9-5.5	0.57	4.93 (0.81) 2.39-6.94
IS	4.2 (0.6) 3.0-4.7	3.3 (0.4) 2.7-3.7	2.8 (0.3) 2.3-3.0	3.1 (0.6) 2.3-3.7	2.8 (1.1) 2.0-4.0	2.3 (0.8) 1.7-3.7	3.8 (0.6) 3.0-4.3	3.2 (0.6) 2.3-4.2	0.39	2.05 (0.63) 1-4.46

Table 4. In square brackets [] are the number of observations made for each of the seven teachers. CLASS composite scores are presented as mean values across observations with standard deviation in brackets (). Underneath is the range of scores across all observations. The Total column represents the average across all teachers. The ICC column represents the intra-class correlation measure of consistency for each type of rating.

Figure 2 (below) demonstrates the mean composite CLASS scores for the participating classrooms (bracketed initials indicate the school). The reference lines indicated in the figure are taken from a study conducted by Cloney et al. (2016) based on similar aged children (see Table 4).

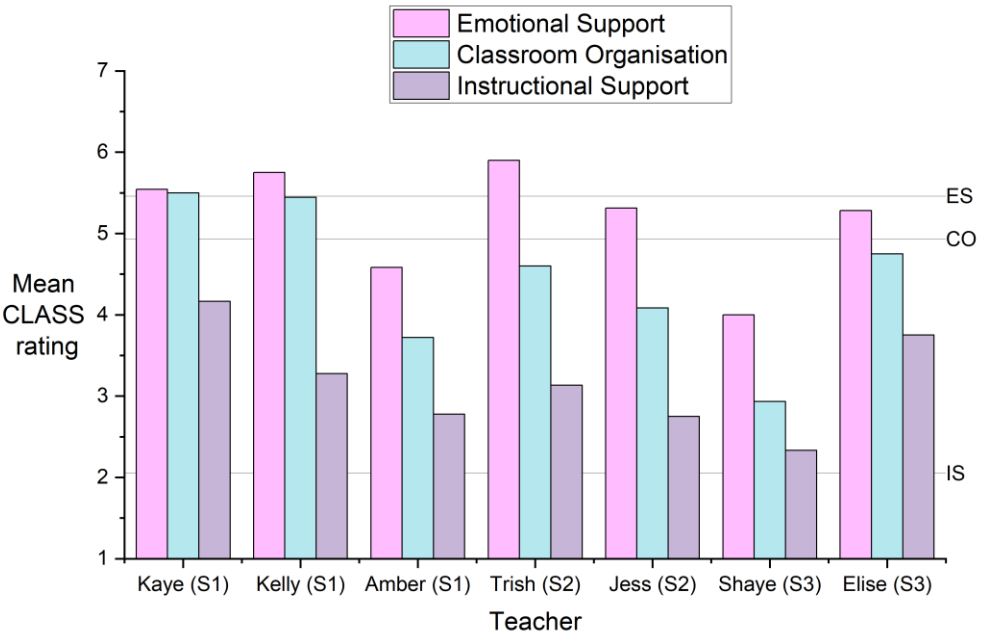

Figure 2. Composite CLASS scores (graph representing figures from Table 4)

Figure 2 demonstrates all participating schools outperformed the contexts observed in Cloney et al.'s (2016) study in Instructional Support. Regarding the Emotional Support scores, three teachers exceeded the reference scores, with two of those teachers from S1. These same two teachers were the only ones to exceed the Classroom Organisation reference score.

Observations

Extensive fieldnotes on teacher practices were made throughout the data collection period. These observations complemented the CLASS notes and gave context for the teacher interviews and supported the classification into NQS themes discussed in the following section.

Teacher Interviews

Participant interview statements were organised under themes corresponding to elements of the NQS. The number of times the theme was discussed was quantified and presented as percentiles in Table 5 (below). These themes and frequencies were useful in triangulating the data to assure validity of the research as well as for capturing the different dimensions of teacher-student interactions and indicators of quality. Comments included statements such as, "If the program is too boring, sterile or is too much teacher led, they [the children] become compliant" (Kaye [S1], Element 1.1.2, child-centred)

.

			School 1			School 2		School 3	
			Kaye	Kelly	Amber	Trish	Jess	Shaye	Elise
QA1 - Educational program and practice									
1.1	Program								
Element		**Descriptor**							
1.1.2	Child centred	Each child's current knowledge, strengths, ideas, culture, abilities and interests are the foundation of the program.	10%	-	42%	38%	36%	20%	66%
1.1.3	Program learning opportunities	All aspects of the program, including routines, are organised in ways that maximise opportunities for each child's learning.	36%	45%	7%	13%	38%	20%	17%
1.2	Practice								
1.2.1	Intentional teaching	Educators are deliberate, purposeful, and thoughtful in their decisions and actions.	29%	45%	35%	26%	26%	-	-
1.2.2	Responsive teaching and scaffolding	Educators respond to children's ideas and play and extend children's learning through open-ended questions, interactions and feedback.							
1.2.3	Child directed learning	Each child's agency is promoted, enabling them to make choices and decisions that influence events and their world.							
1.3	Assessment and planning	Educators and co-ordinators take a planned and reflective approach to implementing the program for each child							
1.3.2	Critical reflection	Critical reflection on children's learning and development, both as individuals and in groups, drives program planning and implementation.	2%	-	-	-	-	-	-
QA3 – Physical environment									
3.2	Use								
3.2.1	Inclusive environment	Outdoor and indoor spaces are organised and adapted to support every child's participation and to engage every child in quality experiences in both built and natural environments.	21%	9%	7%	-	-	-	-
3.2.2	Resources support play-based learning	Resources, materials and equipment allow for multiple uses, are sufficient in number, and enable every child to engage in play-based learning.				-	-	-	-
QA5 – Relationships with children									
5.1	Relationships between educators and children								
5.1.1	Positive educator to child interactions	Responsive and meaningful interactions build trusting relationships which engage and support each child to feel secure, confident and included.	2%	1%	-	-	-	-	-
5.2	Relationships between children								
5.2.2	Self-regulation	Each child is supported to regulate their own behaviour, respond appropriately to the behaviour of others and communicate effectively to resolve conflicts.	-	-	9%	13%		60%	17%

Table 5. Teacher interview topic categories. The percentages represent the proportion of statements made referring to each NQS Quality Area (QA). For example, 29% of the statements provided by Kaye were categorised as QA1 'practice' in elements 1.2.1, 1.2.2 and 1.2.3. Only those NQS elements evident in the interviews are presented in the table.

Discussion

Previous studies indicate CLASS has been useful in examining quality in Australian schools (e.g., Cloney et al., 2016; Thorpe et al., 2020). Chief disadvantages identified by Thorpe et al. (2020) were that variations across time periods and content systematically biased CLASS scores. These disadvantages were also noted in the present study with the additional observation that many quality interactions took place during outdoor 'free time' when CLASS observations did not take place. The following discusses the data organised under the three CLASS domains. In these sections we highlight how effective CLASS was in evaluating student and teacher interactions.

Emotional Support

The total CLASS composite score for Emotional Support across the schools was 5.2 which was consistent with the Cloney et al. (2016) reference mean score of 5.46 (see Table 4). This high-mid-range suggested all classrooms had demonstrated evidence of positive conversation, proximity, respect and positive shared affect (Pianta et al., 2008). The observations and interviews also provided evidence of positive emotional support as indicated by the NQS, however, these were spread across different Quality Areas (QA) and elements, for example, generally the teachers reflected children's strengths, ideas, culture, abilities and interests (QA1, ACECQA, 2020) and built trusting relationships to support children in feeling confident and included (QA5, ACECQA, 2020).

The in-depth descriptions of low, mid-, and high ranges for each dimension provided in the CLASS K-3 manual identified a more descriptive analysis of quality interactions than what could be gleaned from the NQS. For example, Kelly (S1) stopped and listened to a student who spontaneously began clapping the syllables in a word commenting, 'You are good with your words' (CLASS observation 14/6/2019). These characteristics capture which interactions can lead to quality, highlighting practical ways teachers can both deepen and maintain classroom quality in Emotional Support (Siraj et al., 2019).

The CLASS data supported the interdependence between domains as highlighted by Williford et al. (2013). Specifically, higher Emotional Support scores tended to correspond with higher scores across all domains and the same applied with lower scores. With the higher ratings in Emotional scores, many instances of teacher responsivity were observed. For example, Kelly (S1), who received a high-mid-range score (mean = 5.8) for Emotional Support, referred to a responsive curriculum with statements such as "I am always reading the room and changing things to suit the children" (Table 5: 45% of conversation, QA1, ACECQA, 2020). Williford et al. (2013) found teachers' overall responsivity related to gains in pre-schoolers' school readiness, and as such contribute to higher scores in the other domains. While evidence of responsivity was noted in the NQS, the CLASS instrument observations enabled a nuanced account that had the potential to further support teacher reflection and quality improvement.

The regard for student perspectives (Pianta et al., 2008) also contributed to higher Emotional Support scores with student leaderships and flexibility noted in the CLASS scoring, observations and interviews. Many of the teachers acknowledged the need to maintain flexibility, or as Kaye stated, "give yourself permission to change direction" (Interview, 12/6/2019). Additionally, Kaye was observed to elicit children's ideas and imbue them within lessons, giving children ownership of their work. On this note, all the teachers acknowledged the importance of responsivity and regard for student perspectives in their interviews (Table 5: QA1 and QA5, ACECQA, 2020). However, only those who were

observed to implement these in their interactions rated higher in CLASS. This finding implicates an impediment between theory and practice. It also suggests that the practical observations enabled through CLASS could be useful in transitioning theory into practice.

As there were common factors observed among higher Emotional Support scores, there was also a common focus with teachers who tended to score lower. In CLASS, student behaviour (behaviour management) is classified under Classroom Organisation (Figure 1). Behavioural issues were often accompanied with negative affect, hence it impacted on the Emotional support scores. Our observations identified two key contexts in which these appeared to be more concentrated. The first was when children participated in extended periods of passive activity, and the second was when children had to wait.

First, one classroom began the day with a succession of whole group activities in literacy, movement and number that were generated from the Smart Board. While the children were observed to respond to the computer prompts during the literacy and movement activities, when it came to number section, they grew restless. Over the course of the session, the teacher's comments became increasingly centred on student behaviour taking time away from learning and less positive affect was observed. Shaye's (S3) interview revealed she had concerns about the behaviour with 60% of her responses centred on this topic (Table 5: 5.2.2, ACECQA, 2020). Regarding classroom quality, she commented,

> *… to be on top of behaviour management would help - being animated and having short sharp lessons. Behaviour management and the pace of the lesson. I think overall I have a good relationship with the kids; it's the behaviour management (Interview, 20/6/2019).*

The second context centred around both waiting and unclear routines. Children were observed waiting for activities to be prepared or directions about their next activity. This waiting resulted in aimless wandering and increased undesired behaviour. Shaye did not refer to organising the environment in her interview; however, the interviews went for only 15 minutes, and this factor may have been missed due to time.

Classroom Organisation

In this study, the Classroom Organisation domain was useful in examining notions of quality, and the data gained from this tool were consistent with data gathered using the other tools. Classroom Organisation is centred around factors effecting student productivity and behaviour. The NQS has various elements that indicate quality Classroom Organisation such as QA1 in particular 'program learning opportunities', and QA3 regarding an inclusive environment.

The CLASS composite score for Classroom Organisation across the schools was 4.4, which was consistent with Cloney et al.'s (2016) study of 4.93 (Table 4). Kaye and Kelly (both S1) had the highest Classroom Organisation scores (mean 5.5 and 5.4 respectively), and S1 was the only school to discuss the environment (Table 5: QA3, ACECQA, 2020) in their interviews. Observations taken as part of the CLASS fieldnotes indicated that these classrooms invested in a variety of well-chosen modalities to absorb children in activities. In addition to well-prepared activities, S1 utilised interesting and creative material, hands-on opportunities, peer-support strategies, and piano riffs to support and define quality moments in learning as the following vignette describes:

> *The children sat on the mat and Kaye pulled out her box of 'popcorn' words. She turned on the music and the children passed the box around, when the music stopped the student holding the box pulled out a word, read it out aloud, and then put it in a sentence. Once finished, the music recommenced, and the box*

resumed its journey. One child baulked at forming a sentence and informed Kaye she wanted to "phone a friend".
Kaye modelled writing a sentence, and then asked all children share their own sentence with a partner. Kaye gave the children a goal of writing for 10 minutes and issued them their own personal challenge, such as, "Do you think you could write two sentences today?". The transition from mat to tables was fluid and when the egg timer commenced, Kaye put on a classical piano riff that filled the classroom with a sense of importance (Observation, 12/6/2019).

The vignette demonstrated Kaye's sensitivity to the children as she introduced support mechanisms such as 'think-pair-share' and 'phone a friend'. The former technique is recognised for increasing children's active engagement in learning processes (Sugiarto & Sumarsono, 2014) and both techniques empower children to take risks (Wahyuniar et al., 2019). Kaye showed 'regard for student perspectives' by encouraging the children to follow their idea of what to write. The NQS reflects regard for children's perspectives in QA1.2.3 (ACECQA, 2020) where children's agentic behaviours are promoted. Additionally, Kaye encouraged self-regulated learning and children worked toward achieving goals (i.e., work to 10 minutes, challenged children based on individual performance) (Pianta et al., 2008). Possibly more prominent, were the 'productivity' and 'instructional learning formats' that facilitated activities and maximised time spent in learning. Productivity was enhanced by seamless transitions, where the children knew what to do, and appeared fuelled by a sense of purpose.

The 'instructional learning format' in Kaye's room was typified by a range of interesting materials that engaged the children and maximized learning opportunities. The 'popcorn' box, a selection of words, music to move to, music to write to, the egg timer and writing materials that were pre-prepared for the children honoured their activity, and in doing so, engaged them deeper in the learning. This preparation was intentional in School 1 (Table 5: QA3, ACECQA, 2020). Once again, the NQS captured the quality of interactions in Classroom Organisation, however, the CLASS descriptors enabled greater clarity of the actions that constituted these notions of quality (Siraj et al., 2019).

Instructional Support

While we found utility in the CLASS instrument for assessing quality regarding Emotional Support and Classroom Organisation, this was not evident with the Instructional Support domain. On examining the above vignette using the NQS as a lens, it is evident Kaye addressed key indicators of QA1, such as enabling each child to make choices and decisions to influence events and their world and organised the environment and routines to maximise opportunities for learning (ACECQA, 2020). While indicative of good practice, commensurately the Instructional Support rating in this classroom did not align with these notions of quality.

In this study, the total CLASS composite score across the schools for Instructional Support was 3.2 (low-mid-range, see Table 4), in comparison, the reference score from Cloney et al.'s (2016) study was 2.05 (low range). The data gained from the interviews indicated that all teachers strived to provide high quality instructional support, whereas these efforts were not captured by the CLASS instrument. The observations made when gathering data for the CLASS ratings contradicted the score, as they were consistent with key features of quality instruction described in the NQS. These features centred on 'child-centred', 'intentional teaching', 'responsive teaching and scaffolding' and 'child-directed learning' pedagogy (ACECQA, 2020, p. 90), and each were dependent on listening to children to ascertain and extend their understanding, interests, and ideas.

We propose two possible explanations for the low Instruction Support scores. The first relates to the CLASS instrument instruction that observers "terminate observation and

not assign codes during recess and outdoor free time" (Pianta et al., 2008, p. 11); and the second can be explained through the features of the NQS as described in the previous paragraph, coupled with Thorpe's (2021) suggestion that low Instructional Support scores could be explained through Houen et al.'s (2019) emphasis on the relevance of silence in interactional spaces.

First, we noted that due to the CLASS observation rule to "terminate observation and not assign codes during recess and outdoor free time" (Pianta et al., 2008, p. 11), rich contexts that showcased children's "current knowledge, strengths, ideas, culture, abilities and interests" (QA1, ACECQA, 2020) were missed. For example, during the breaks at School 1 a group of children organised and choreographed concerts for the teachers. The teachers facilitated by being responsive to the children's needs, offering props when 'directed' and by demonstrating shared positive affect, and through the promotion of student autonomy and leadership. Hence, these creative moments of "brainstorming", "planning" and "producing" were not recorded using the measure (Pianta et al., 2008, p. 64).

A feature of enhancing play during outdoor and lunch breaks is the active role taken by both children and teachers. Teachers' involvement is considered as an important factor for the relationship between play and developmental outcomes (Aras, 2016). Moreover, the role the teachers took enhanced children's learning through play by responding to their ideas (QA1, ACECQA, 2020) while supporting their confidence to act autonomously and make their own choices (Aras, 2016; Pianta et al., 2008). In this way, the NQS was better designed to capture quality than CLASS and though admittedly a broad focus (Siraj et al., 2019), it provided a lens to examine quality during these child-initiated experiences.

The second explanation refers to the silences in interactional spaces and emphasis on listening and responding to children (ACECQA, 2020; Houen et al., 2019). After children are invited to wonder, silences contribute to children's learning as they are enabled to think deeply about possibilities (Houen et al., 2019). Within the 20-minute CLASS observation periods, these silences tend not to be recorded as instructional quality. The data from observations and interviews, suggested silences were an integral part of student-centred practice where teachers invited children to contribute to discussion and learning.

Limitations

Limitations to the study may include the CLASS intra-class correlations (ICCs) across sub-scales were low (i.e., 0.39-0.57), indicating that the ratings within individual teachers across the schools are quite variable. As CLASS relies on limited number of observations, this calls into question the validity of the measures provided by CLASS. Furthermore, the training, and costs associated with CLASS instrument limits its utility in Australian schools.

Additionally, the small sample size limits the findings from this study being generalised to wider populations and second, all three schools participating in the study were Independent private schools, which may exclude generalising the findings to broader socioeconomic areas. It is also noted that teacher detail is missing from the study that may have provided greater depth to their stories, for example, their age and years of experience. Finally, CLASS scoring was performed at each school over one day. While this may be a benefit in some cases, in others it may be considered a limitation of the tool.

Conclusion

In this study we found some evidence to support the validity and utility of the CLASS instrument in Australian schools. However, there was mixed evidence for the use of CLASS regarding the Instructional Support domain. We rationalised the discrepancies we found by examining quality as it is positioned by the NQS and through the silences explained by

Houen et al. (2019). These moments of honouring children's time to think things through were not rateable by CLASS, and in some cases prevented higher ratings from occurring.

Furthermore, we noted that outdoor free play provided a rich context for child-centred learning that was not captured by CLASS. These contexts provided instances of key features of Instructional Support that could not be added to the quality of the classroom. In contrast, the NQS promotes the quality of both indoor and outdoor environments, and the role each play in children's learning. In this regard, the NQS supported a broader perspective of quality than what is currently offered by the CLASS instrument.

To some degree we concur with Siraj et al.'s (2019) assessment of the NQS as being more focused on structural and regulatory quality than process quality. However, when compared with the CLASS Instructional Support domain we found the NQS was more likely to promote child agentic and centred behaviours through not only the silences it afforded (Houen et al., 2019), but also the child-initiated experiences it recommended as good practice. A recommendation for CLASS would be to build in a focus on child behaviours in conjunction with the teacher behaviours that typify the Instructional Support domain. In this way, a more dialogic approach to the co-construction of concepts can be examined and a view of quality that is consistent with the research may be achieved. Finally, we recommend further studies examining the potential of CLASS in complementing the NQS in early years school settings.

References

Aras, S. (2016). Free play in early childhood education: a phenomenological study. *Early Child Development and Care, 186*(7), 1173-1184. https://doi.org/10.1080/03004430.2015.1083558

Australian Children's Education and Care Quality Authority. (n.d.). *Authorised officer training.* https://www.acecqa.gov.au/resources/authorised-officer-training

Australian Children's Education and Care Quality Authority. (2020). *National Quality Standard Assessment and Rating Instrument*. https://www.acecqa.gov.au/sites/default/files/2020-09/NQS_AssessmentRatingInstrument.pdf

Aguiar, A.L., & Aguiar, C. (2020). Classroom composition and quality in early childhood education: A systematic review. *Children and Youth Services Review, 115*, 1-26.Xx & xx (2018)

Burchinal, M., Vandergrift, N., Pianta, R., & Mashburn, A. (2010). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly, 25*(2), 166-176. https://doi.org/10.1016/j.ecresq.2009.10.004

Burchinal, M., Zaslow, M., & Tarullo, L. (2016). Quality thresholds, features and dosage in early care and education: Secondary data analyses of child outcomes. *Monographs of the Society for Research in Child Development, 81*. https://doi.org/10:1111/mono.12236

Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research Methods. *Neurological Research and Practice, 2*(14), 1-10. https://doi.org/10.1186/s42466-020-00059-z

Cadima, J., Nata, G., Barros, S., Coelho, V., & Barata, C. (2020), "Literature review on early childhood education and care for children under the age of 3", *OECD Education Working Papers*, No. 243, OECD Publishing, Paris, https://doi.org/10.1787/a9cef727-en.

Cloney, D., Cleveland, G., Hattie, J., & Tayler, C. (2016). Variations in the availability and quality of early childhood and education and care by socioeconomic status of neighbourhoods. *Early Education and Development, 27*(3), 384-401. https://doi.org/10.1080/10409289.2015.1076674

Fenech, M., Harrison, L., Press, F., & Sumsion, J. (2020). Using metaphor to illuminate quality in early childhood education. *Australasian Journal of Early Childhood, 45*(20), 197-210. https://doi.org/10.117/1836939/209/8482

Hamre, B. (2014). Teachers' daily interactions with children: An essential ingredient in effective early childhood programs. *Child Development Perspectives.* https://doi.org/10.1111/cdep.12090

Harms, T., Clifford, R.M., & Cryer, D. (2005). *Early Childhood Environment Rating Scale–Revised.* Teachers College Press.

Houen, S., Danby, S., Farrell, A. & Thorpe, K. (2019). Adopting an unknowing stance in teacher–child interactions through 'I wonder…' formulations. *Classroom Discourse, 10*(2), 151-167. https://doi.org/10.1080/19463014.2018.1518251

Xx & xx

Organisation for Economic Co-operation and Development. (2016). *Starting Strong IV Monitoring quality in early childhood education and care country note.* OECD.

Phillips, A. (2020). An investigation of long day care services in Australia that are Exceeding the National Quality Standard (Doctoral dissertation). Retrieved from https://ses.library.usyd.edu.au/bitstream/handle/2123/22869/ALICIA%20PHILLIPS%20PHD%20THESIS%20.pdf?sequence=1&isAllowed=y

Pianta, R., La Paro, & Hamre, B. (2008). *Classroom Assessment Scoring System: Manual K-3.* Teachstone.

Regnault, A., Willgoss, T., & Barbic, S. (2018). Towards the use of mixed methods inquiry as best practice in health outcomes research. *Journal of Patient-Reported Outcomes, 2*(19), 1-4. https://doi.org/10.1186/s41687-018-0043-8

Simpson, S. (2010). Naming and shaming for pre-schools. *Education; Surry Hills, 91*(10), 8.

Siraj, I., Kingston, D., & Melhuish, E. (2015). Assessing Quality in Early Childhood Education and Care. Sustained Shared Thinking and Emotional Wellbeing (SSTEW) Scale for 2–5 year olds provision. IOE UCL Press.

Siraj, I., Howard, S.J., Kingston, D., Nilsen-Hewett, C., Melhuish, E.C., de Rosnay, M. (2019). Comparing regulatory and non-regulatory indices of early childhood education and care (ECEC) quality in the Australian early childhood sector. *The Australian Educational Researcher, 46,* 365–383. https://doi.org/10.1007/s13384-019-00325-3

Slot, P.L., Bleses, D., Justice, L.M., Markussen-Brown, J., & Højen, A. (2018). Structural and Process Quality of Danish Preschools: Direct and Indirect Associations With Children's Growth in Language and Preliteracy Skills. *Early Education and Development, 29*(4), 581-602. https://doi.org/10.1080/10409289.2018.1452494

Sokolovic, N., Brunsek, A., Rodrigues, M., Borairi, S., Jenkins, J.M. & Perlman, M. (2021). Assessing Quality Quickly: Validation of the Responsive Interactions for Learning - Educator (RIFL-Ed.) Measure. *Early Education and Development.* https://doi.org/10.1080/10409289.2021.1922851

Sugiarto, D., & Sumarsono, P. (2014). The implementation of think-pair-share model to improve students' ability in reading narrative texts. *International Journal of English and Education, 3*(3), 206-215.

Sutherland, K.S., Conroy, M.A., Algina, J., Ladwig, C., Jessee. G., & Gyure, M. (2018). Reducing child problem behaviors and improving teacher-child interactions and relationships: A randomized controlled trial of BEST in CLASS. *Early Childhood Research Quarterly, 42,* 31–43. http://dx.doi.org/10.1016/j.ecresq.2017.08.001

Swain, J.M. & Spire, Z.D. (2020). The Role of Informal Conversations in Generating Data, and the Ethical and Methodological Issues They Raise. *Forum Qualitative Sozialforschung, 21*(1). https://www.qualitative-research.net/index.php/fqs/article/view/3344/4511

Sylva, K., Siraj-Blatchford, I., & Taggart, B. (2003). *Assessing quality in the Early Childhood Rating Scale Extensions (ECERS-E).* Trentham Books.

Tayler, C., Ishimine, K., Cloney, D., Cleveland, G., & Thorpe, K. (2013). The quality of early childhood education and care services in Australia. *Australasian Journal of Early Childhood*, *38*(2), 13-21.

Teachstone (n.d.). *CLASS Observer Certification.* https://teachstone.com/class-certifications/

Thorpe, K. (2021). *What makes the difference in the long-term?: Policy and practice implications large-scale longitudinal studies of Early Childhood Education and Care in Australia.* ACEL Early Childhood Online Conference 2021. https://www.acel.org.au/ACEL/ACELWEB/ACELWEB/Events/2021/Early_Childhood_Conference/About.aspx

Thorpe, K., Rankin. P., Beatton, T., Houen, S., Sandi, M., Siraj, I., Staton, S. (2020). The when and what of measuring ECE quality: Analysis of variation in the Classroom Assessment Scoring System (CLASS) across the ECE day. *Early Childhood Research Quarterly, 53,* 274–286. https://doi.org/10.1016/j.ecresq.2020.05.003

Thorpe, K., Westwood, E., Jansen, E., & Menner, R., Houen, S., & Staton, S. (2021). Working Towards the Australian National Quality Standard for ECEC: what do we know? Where should we go? *The Australian Educational Researcher, 48,* 227–247. https://doi.org/10.1007/s13384-020-00387-8

Tonge, K.L., Jones, R.A. & Okely, A.D. (2019). Quality interactions in early childhood education and care center outdoor environments. *Early Childhood Education Journal, 47,* 31–41. https://doi.org/10.1007/s10643-018-0913-y

Wahyuniar., Riwu, L., & Santo, Z. (2019). Think pair share solutions of storytelling learning. *Advances in Social Science, Education and Humanities Research, 383,* 90-93.

Williford, A.P., Vick Whittaker, J.E. Vitiello, V.E., & Downer, J.T. (2013). Children's engagement within the preschool classroom and their development of self-regulation. *Early Education Development, 24*(2), 162–187. https://doi.org/10.1080/10409289.2011.628270

Ying Hu, B., Fan, X., Yang, Y., & Neitzel, J. (2017). Chinese preschool teachers' knowledge and practice of teacher-child interactions: the mediating role of teacher' beliefs about children. *Teaching and Teacher Education, 63,* 137-147. https://doi.org/10.1016/j.tate.2016.12.014