Quality Teaching Rounds as a professional development intervention for enhancing the quality of teaching: Rationale and study protocol for a cluster randomised controlled trial

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Abstract

Professional development is widely considered important for enhancing the quality of teaching for enhanced student learning. Yet few studies have demonstrated such impacts. This protocol for a cluster randomised controlled trial involving 24 schools tests a structured collaborative approach to professional development called Quality Teaching Rounds. The study seeks to establish: which features of Quality Teaching Rounds are fundamental to its effectiveness; how, why, and for whom participation in Quality Teaching Rounds supports improvement in teaching practice; and, to what extent the Quality Teaching Rounds intervention can be implemented to build and sustain teacher capacity. The primary outcome measure, quality of teaching, will be analysed using linear mixed models and the quantitative modelling will be complemented with qualitative evidence.

Keywords:
Teacher development
Intervention
Professional development
Teaching rounds
Quality teaching

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1. Introduction

In Australia, and internationally, there has been an escalation of government investment (both rhetorical and financial) in improving the quality of teachers and teaching in order to improve student outcomes and reduce equity gaps (Carter, 2015; Jensen, Hunter, Sonnemann, & Burns, 2012; McKenzie, Santiago, Sliwka, & Hiroyuki, 2005; Teacher Education Ministerial Advisory Group, 2014). Teaching standards, teacher institutes, and government investment in the science of learning and measurement of quality, all signal a growing urgency for finding ways to improve teaching. These initiatives rest, to a significant extent, on the capacity for and effectiveness of teacher development.

Evidence-based approaches to teacher development that improve teaching quality have been glacially slow to emerge in a context where rapid reform is urgently sought. Existing research is dominated by small-scale studies with a dearth of larger and longer term studies (Cochran-Smith & Zeichner, 2005; Feuer, Towne, & Shavelson, 2002; Wilson, Floden, & Ferrini-Mundy, 2001). Moreover, few studies demonstrate clear relationships between teacher professional learning and improvement in teaching, let alone consequential improvements in student outcomes (Ladwig, Smith, Gore, Amosa, & Griffiths, 2007; Vescio, Ross, & Adams, 2008). Collaborative forms of teacher development are increasingly privileged, informed by a growing consensus on principles of effective development (Avalos, 2011; Bowe & Gore, under review; Hawley & Valli, 1999; Imants & van Veen, 2010; Newmann, King, & Youngs, 2000).

Where measures of teaching quality are used in research examining the impact of professional development, relatively low quality is found in many schools and classrooms (King & Bouchard, 2011; Ladwig et al., 2007; Newmann & Associates, 1996). Explanations for the low impact of professional development on teaching quality include: teaching cultures in many schools that perpetuate conservative approaches to teaching (Flores & Day, 2006; Little, 2006); conditions that limit teacher self-efficacy and collective responsibility (Goddard, Hoy, & Hoy, 2004; Hoy, Hoy, & Kurz, 2008; Louis, 2006; Tschannen-Moran & Hoy, 2007) or inflate efficacy in ways that productively tend the status quo (Blase, 1988); high attrition amongst early career teachers (Ingersoll & Smith, 2003); and high burnout and low morale among teachers in general (Day & Smethem, 2009; Dorman, 2003; Özer & Beycioglu, 2010) risking a recursive downward spiral in systems and schools.

This study is designed to intervene in this context by addressing the following major aims:

1. To test, on a rigorous scale, an approach to teacher professional development known as Quality Teaching Rounds for its capacity to impact on teaching quality and student outcomes; and
2. To explain the functioning of this approach to teacher development through analysis of interactions of the approach with teacher identity, teaching culture, and teachers' career trajectories.

The study takes the form of a three-arm cluster randomised controlled trial comparing the impact of participation in Quality Teaching Rounds for two intervention groups and a wait-listed control group. This paper outlines the protocol for the study.

2. Methodology

2.1 Background to the intervention

The study builds on our previous research into Quality Teaching, a pedagogical framework, and Quality Teaching Rounds, an approach to teacher development using the framework (outlined below) (Amosa, Ladwig, Griffiths, & Gore, 2007; Gore, 2014a, 2014b; Ladwig et al., 2007). This research has produced effect sizes of over 1.0 for teaching quality and teacher satisfaction in non-experimental

studies, when comparing teachers who have received the Quality Teaching Rounds intervention and "non-intervention" populations. These prior studies have mapped the average quality of teaching prior to intervention, and investigated whether the intervention made a difference using both quasi-experimental and "design experiment" conditions (Penuel, Fishman, Cheng, & Sabelli, 2011; see also Gore, 2014a for overview).

The next step in this program of research is to test the effects of Quality Teaching Rounds using the most rigorous of study designs, as proposed here, in order to contribute to the body of empirical evidence on impactful professional development initiatives (Gorard, 2010; Hattie, 2008). Quality Teaching Rounds, developed by Bowe and Gore in 2008, is designed to bring together the benefits of professional learning communities (e.g., DuFour, 2004), instructional rounds (City, Elmore, Fiarman, & Teitel, 2009), and the Quality Teaching (QT) framework (New South Wales Department of Education and Training [NSWDET], 2003) in an approach to professional development that makes a measurable difference to the quality of teaching.

Quality Teaching Rounds involve groups of teachers (typically between four and eight teachers) working in a "professional learning community" (PLC) to analyse and refine the quality of their teaching practice. Each PLC member takes a turn to teach a regular lesson, observed by the other PLC members who use the Quality Teaching framework, as elaborated in the *Quality Teaching Classroom Practice Guide* (NSWDET, 2003), to guide their observations, coding, feedback, and discussion with other members of the PLC. The QT framework provides teachers with a shared set of concepts and language for discussing the quality of teaching and fostering collaboration. Informed by professional readings as well as the lesson observations, the emphasis of Quality Teaching Rounds is on the conversations teachers have about teaching and learning; not just for the lesson observed but how that lesson characterises the way they teach/teach in a particular subject area/teach at their school/have always taught (Bowe & Gore, under review).

The Quality Teaching framework is a pedagogical model comprised of three dimensions: Intellectual Quality, Quality Learning Environment, and Significance. It builds on the Authentic Pedagogy (Newmann & Associates, 1996) and Productive Pedagogy (Gore, 2007; Gore, Griffiths, & Ladwig, 2004) frameworks. Each dimension consists of six elements as listed in Table 1 and Appendix A. The development of the QT framework was commissioned by the then-New South Wales Department of Education and Training and has been taken up by various school systems throughout Australia (NSW Department of Education and Communities, ACT Education and Training Directorate, and many Catholic education dioceses). It has also been utilised by other researchers who have reported the transformative capacity of the framework in terms of teachers' practice (e.g., Aubusson, Steele, Dinham, & Brady, 2007; Ewing et al., 2010; Hammond, 2008; Penney, Brooker, Hay, & Gillespie, 2009; Plummer, Nyholm, Quince, & Dione, 2010; Rushton, 2008; Treble, 2009).

Table 1
Elements of the Quality Teaching framework

Intellectual Quality	Quality Learning Environment	Significance
Deep knowledge	Explicit quality criteria	Background knowledge
Deep understanding	Engagement	Cultural knowledge
Problematic knowledge	High expectations	Knowledge integration
Higher-order thinking	Social support	Inclusivity
Metalanguage	Students' self-regulation	Connectedness
Substantive communication	Student direction	Narrative

Materials to support both research and professional development using the QT framework enable "diagnosis" of teaching quality. Descriptors provided for coding each element on a 1–5 scale form the basis of professional judgement and conversation in Quality Teaching Rounds about the observed quality of teaching and learning and ways to improve (NSWDET, 2003). The specific descriptors provide a clear and shared mechanism by which teachers are able to analyse what they see in lessons observed (in each other's Rounds) and the impact the instruction is having on students.

2.1.1 The intervention

Eight teachers from each participating school (see section 2.3.2) will participate in the Quality Teaching Rounds intervention, forming PLCs consisting of between three and eight teachers depending on their intervention group allocation – see section 2.3). Prior to commencing Rounds, at least four of the eight teachers from each school in the intervention groups will participate in a two-day Quality Teaching Rounds workshop to prepare them for conducting their own Rounds (the teachers in the control group schools will wait for 12 months before participating in the Quality Teaching Rounds workshop or intervention). Participating schools can decide if they want to send more of their teachers to the training. The two-day workshop will be facilitated by two highly qualified research staff (Gore and Bowe, the creators of the Quality Teaching Rounds approach), and held at centrally located facilities. To ensure researchers conducting lesson observations do not find out schools' group allocation, they will not be involved in this training aspect of the study.

The training workshops will provide background information on the Quality Teaching framework and Quality Teaching Rounds, highlighting the intention and importance of each component of the approach (i.e., PLCs, readings, observation, individual coding, group discussion). Teachers will be given opportunities to practise the QT coding process and to participate in simulated Rounds using sample video-recorded lessons. An overview of the research design will also be provided.

During the study period (time between baseline data collection and 6-month follow-up) teachers participating in the intervention will carry out Quality Teaching Rounds in accordance with the allocation of their school to the "Set" or "Choice" form of Rounds. In the QTR-Set group, participating teachers will form two PLCs of four teachers each and conduct two full sets of Rounds, such that each teacher has two lessons observed. In the QTR-Choice group, teachers have more flexibility to adapt Quality Teaching Rounds to suit their/school situation, with PLCs comprising between three and eight teachers and each PLC choosing whether to conduct one or more full sets of Rounds (see section 2.3.2).

2.2 Research questions

The central research questions of the project are:

1. What mechanisms are fundamental to the operation and success of the Quality Teaching Rounds approach as taken up and modified by teachers and schools?
2. What specific features of Quality Teaching Rounds and what conditions in schools are associated with teacher learning and improvements in the quality of teaching and student outcomes?
3. How, why, and for whom does participation in Quality Teaching Rounds support improvement in teaching practice and student outcomes?
4. How does participation in Quality Teaching Rounds interact with the teaching culture in schools, teachers' professional identities, and their career plans and aspirations?
5. Does participation in Quality Teaching Rounds work differently for teachers in primary and secondary schools, for teachers with different backgrounds, or teachers at different stages of their careers?
6. To what extent can the Quality Teaching Rounds intervention be implemented and sustained at scale to build teacher capacity?

2.3 Study design

This project is designed to test the efficacy of Quality Teaching Rounds using a cluster randomised controlled trial (RCT), often regarded by policy makers as the "gold standard" in educational (and other) research (Cochran-Smith & Fries, 2005). Using RCTs to test the efficacy of a professional learning approach and refine its core principles and their interaction with the complex array of variables that impact on teachers and teaching is novel in studies of professional development. As Cochran-Smith and Zeichner (2005) argue, such approaches are only appropriate where enough theoretical and empirical work has been completed to identify competing interventions that reflect the most promising alternatives known to have impact on the outcomes in question and are rare in education. From our prior theoretical and empirical work, we now have sufficient evidence to design competing interventions that reflect the most promising combinations of components and conditions shown to have a positive impact on teacher learning, teaching quality, and student outcomes.

Our decision to investigate Quality Teaching Rounds using the experimental methodology of an RCT is intended to serve several purposes. Most importantly, we seek to subject this approach to teacher development to the highest level of scientific scrutiny, adhering to the Consolidated Standards of Reporting Trials (CONSORT) guidelines for group trials (Moher et al., 2010) in order to maximise the independence of judgements, the reliability of data gathered, and the potential for drawing causal inferences. For example, we will establish two research teams (as specified in Table 2) to ensure group allocation is concealed, and when reporting results we will provide a checklist detailing where/how we have adhered to the CONSORT guidelines. Such studies are lacking in the field of teacher development, a field which is often characterised by small-scale, single-site, self-reports of teacher satisfaction (Cochran-Smith & Zeichner, 2005; Feuer et al., 2002; Wilson et al., 2001). If school systems or districts are to invest in an approach like Quality Teaching Rounds, the highest quality evidence of impact on teaching quality and/or student outcomes is needed.

At the same time, however, we acknowledge the limitations of experimental research in the social sciences (such as the difficulty in accounting for the complexities of the social world, the capacity to control for a multitude of variables, and the ethical challenges associated with differentially providing or withholding desirable interventions) and have taken these into account in two ways. First we have

designed the RCT, including the research questions, to gather comprehensive quantitative and qualitative data. Our interest is in measures of teaching quality generated through lesson observations, as well as teachers' experiences and views of the intervention, gleaned through surveys and interviews, and the impact of the intervention at the school level, as explored through case studies.

Second, although this study protocol outlines the experimental design of the RCT, our larger research agenda is best positioned within the field of improvement science (Lewis, 2015). Our aim is to understand how the Quality Teaching Rounds intervention is variously taken up and adapted to the varied contexts of each school; hence our deliberate inclusion in this study of multiple sites of different types and multiple data sources in order to understand how different organisational conditions interact with the intervention to produce (or not produce) improvement. This concern to understand implementation also accounts for the two different intervention groups: QTR-Set and QTR-Choice (see section 2.3.2). We also address the ethical concerns by "wait-listing" the Control group; these schools will participate in Quality Teaching Rounds 12 months after the study commences for the intervention groups.

2.3.1 Randomisation procedures

A call for expressions of interest to participate in the study will go to the 2,200 public schools in the NSW state education system. Responses received within the specified time frame will be checked against the study inclusion/exclusion criteria (see section 2.4.1). Eligible schools will then be stratified based on school type (i.e., primary or secondary), location (i.e., urban or rural), and socio-economic status (SES). Diverse classroom contexts are often seen as a barrier in applying education reforms, as manifest in the common "one size does not fit all" refrain. We wanted to ensure a diverse and representative sample of schools for testing the efficacy of Quality Teaching Rounds and in order to provide some evidence for or against the validity of these common assumptions. Following stratification, 24 schools will then be randomly selected for the trial, three from each of the SES cells located in Figure 1. Following baseline assessments of the quality of teaching, the 24 schools, matched based on SES, geographical location, and school type will then be randomly assigned to one of three conditions (see Figure 2) using a computerised random number generator by a researcher independent of the project. This method is the preferred method of randomisation in cluster randomised trials (Murray, 1998). A description of the three conditions (i.e., Group 1 – QTR-Set; Group 2 – QTR-Choice; Group 3 – Control) is provided below.

2.3.2 Group description

Schools assigned to the QTR-Set intervention and QTR-Choice intervention groups will be asked to establish PLCs comprised of consenting teachers who agree to participate in the Quality Teaching Rounds trial. All participating teachers, regardless of group allocation, will be asked to commit to completing three online surveys and having two of their regular lessons observed by researchers at three points – baseline, 6- and 12-month follow-up. Importantly, in order to ensure the integrity of the data, researchers conducting the classroom observations will be blinded to group allocation at all assessments.

Group 1: QTR-Set. Based on our prior studies, schools in the QTR-Set group will be asked to enact Quality Teaching Rounds in a way that we are confident will produce a significant impact on teaching quality. For this group, the intervention involves a prescribed number of four teachers in each of two PLCs completing two full sets of Rounds, whereby each teacher will "host" two lessons for observation by and discussion with his or her colleagues. Overall, teachers in this group will each participate in eight Rounds, with each teacher having two lessons observed.

Group 2: QTR-Choice. Schools in the QTR-Choice group are afforded the professional flexibility to adapt Quality Teaching Rounds to suit their available resources and conditions. Parameters for the QTR-Choice group are that there must be between three and eight participants per PLC, producing one or two PLCs per school and they can choose to host only one lesson per teacher. Thus, teachers in this group complete a minimum of three Rounds during the intervention period with each teacher having at least one lesson observed.

Group 3: Wait-list control group. Schools randomised to the wait-list control group will be provided with the Quality Teaching Rounds intervention following the completion of all observations (i.e., 12 months from baseline measures). Participants in this group will have the flexibility to implement the QTR-Set or QTR-Choice intervention, or a refined version informed by the analysis of this trial.

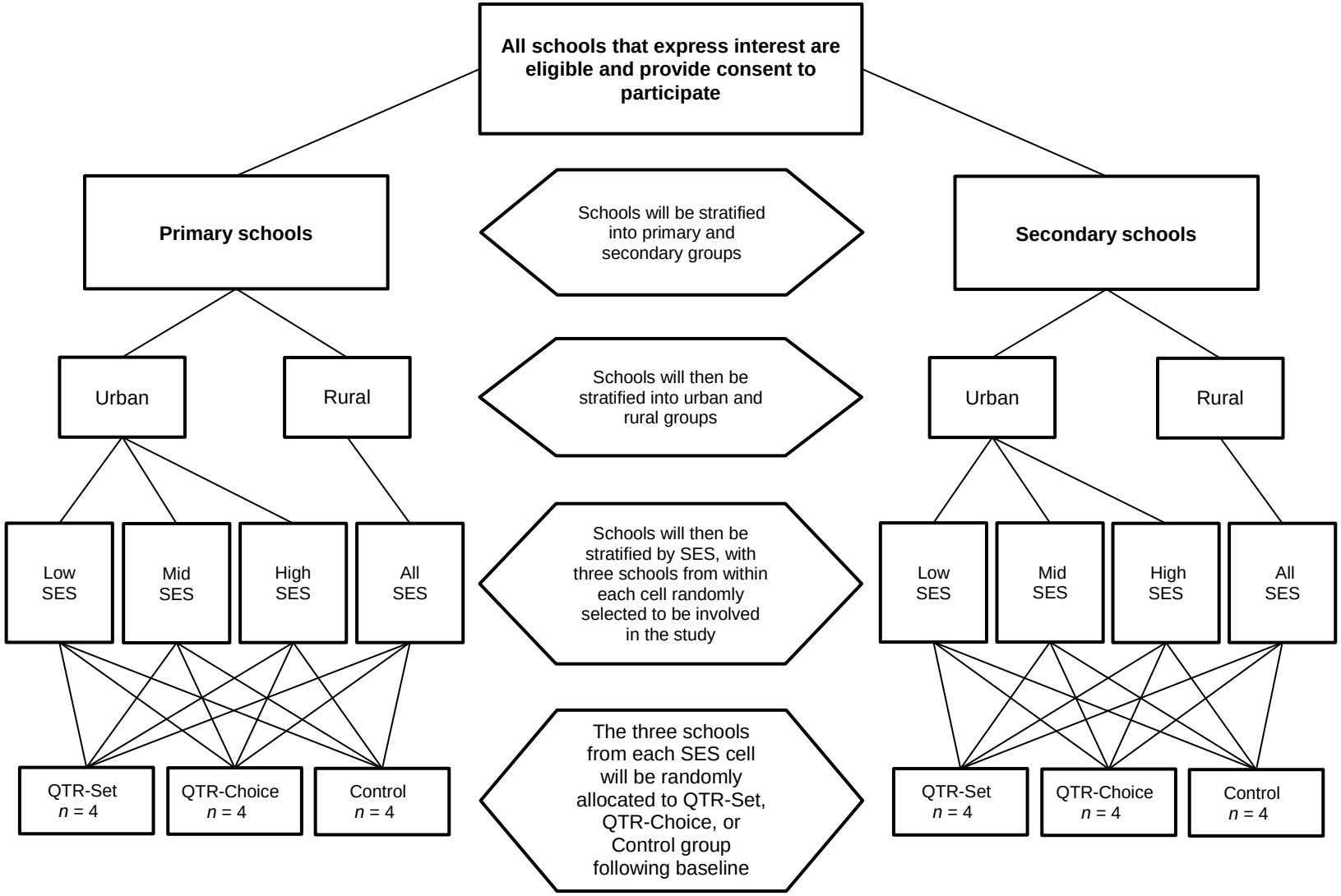

Fig 1. Randomisation approach.

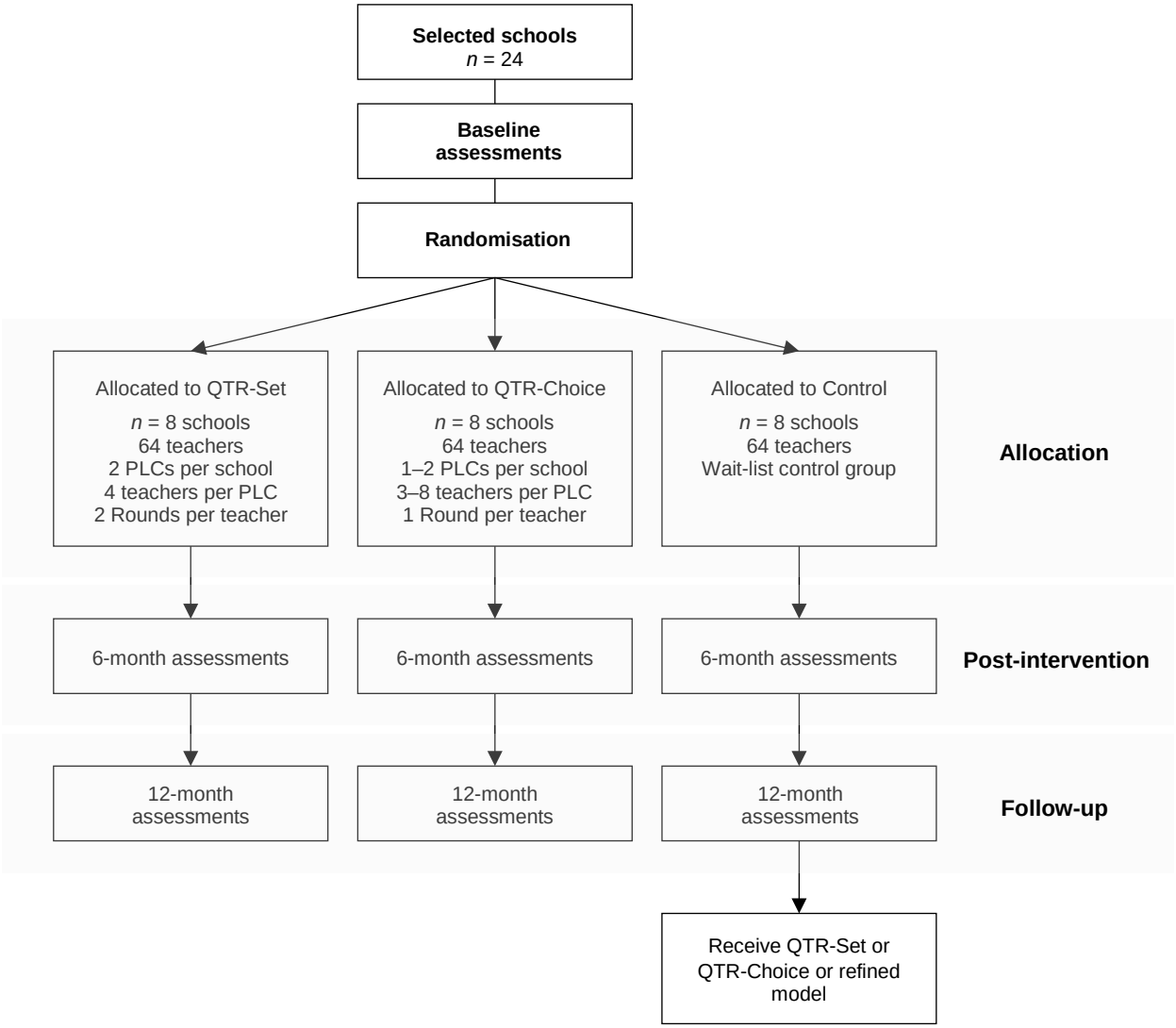

Fig 2. Flowchart describing proposed participant flow through the study.

Two teachers in each of the PLCs operating in these 24 schools will be "tracked" across the course of the study, participating in three semi-structured interviews which focus on their perceptions of Quality Teaching Rounds, the professional learning culture of their school, their own professional learning, their professional identity, and their career plans. Selection of teachers for interview will ensure representation from different subject areas and stages of schooling (year levels) and different career stages (years of teaching experience). Additionally, six participating schools will be identified, using the principle of "maximum variation" (Flyvbjerg, 2006), as case study schools, with all teachers participating in PLCs in these schools invited to take part in focus group interviews at two points within the intervention. A school leader from the case study schools, typically the principal, will also be interviewed.

Interview data will be triangulated with data collected through surveys of all teachers, surveys of their students, and lesson observations and, in the case of the six case study schools, will be contextualised within an analysis of documentary evidence provided by the school in the construction of school profiles that seek to explain and contextualise the impact of Quality Teaching Rounds.

This project has been approved by the University of Newcastle's Human Research Ethics Committee (Approval No. H-2014-0123) and the NSW Department of Education and Communities State Education Research Applications Process (SERAP) (Approval No. 2014103).

2.4 Sample

The study involves 24 NSW Department of Education and Communities (NSWDEC) schools, with an equal number of primary and secondary schools. From these schools, 192 teachers (eight from each school) and approximately 3,500 of their students will form the sample for this study.

2.4.1 Eligibility criteria

To be eligible, schools will need to have sufficient teaching staff (minimum of eight), be prepared to accept any group allocation, and be able to commit to the 18-month study period. Following selection of the 24 schools, written informed consent from the principal and the teachers who will be involved in Quality Teaching Rounds is required. All students of participating teachers will be asked to complete the surveys (i.e., there are no exclusion criteria for students) and arrangement of consent by parents/carers will be coordinated by the schools. This ensures a clear line of communication is maintained between parents/carers and the school, rather than involving a third party (researchers from the University). Some schools will have pre-existing parent consent arrangements for approved research projects.

2.4.2 Sample size calculations

Power calculations were conducted to determine the sample size required to detect changes in the primary outcome (i.e., Quality Teaching score). A total of 192 teachers from 24 schools will be needed to achieve 80% power with alpha levels set at $p < .05$. Based on our previous studies, we anticipate an effect size of $d = 0.5$ (adjusted mean difference of 0.25) for the Quality Teaching Rounds interventions (assuming a mean QT score of 2.6 and standard deviation of 0.5). Our power calculation was adjusted for clustering using a correction factor of [1+ (m-1) x ICC], where m = teachers per school and ICC = the intra-class correlation coefficient. Assuming that eight teachers are recruited from each of the 24 schools and an ICC of 0.07, the correction factor is 1.5 [i.e., 1 + (8-1) x 0.07]. Therefore, the required sample size is 192 teachers from 24 schools. Drawing teachers from schools across three strata (primary/secondary, urban/rural, and SES low/middle/high) in NSW, adds to the replicability, generalizability, and validity of the quantitative dimensions of the study, while providing a sound basis for the variability of case studies developed across qualitative and quantitative dimensions.

2.4.3 Recruitment

In collaboration with the NSWDEC, all public schools will be invited to participate in the study through a formal expression of interest process. Schools expressing interest will receive an information statement (i.e., letter to the Principal detailing the study). Twenty-four schools will be selected to ensure a mix of primary and secondary, urban and rural, and variability in socio-economic conditions. A videoconference will be organised for the 24 schools selected to provide further information about the study and to check all schools understand the requirements of the study and are prepared to accept the random assignment to intervention or control group (see Figure 1 for randomisation approach). Following this, a period of communication will be made available for principals, nominated school contacts, and teachers who want additional information. Once principals provide institutional consent for their schools to participate, teachers and students will be contacted and recruited as detailed below.

Teachers. Principals will be asked to identify eight teachers to be invited to participate in the study, selected to ensure a balance of experience, stage/subject area, and potential benefits for individual teachers participating in the study. Emphasis will be placed on communicating the voluntary nature of participation for teachers. Selected teachers will receive a consent form and participant information statement detailing the study, what will be required of them, benefits, data collection, and confidentiality. Consenting teachers will then form the sample of teachers to participate in the study. In addition, a subsample of teachers, two from each school, will be purposefully selected to take part in two to three semi-structured interviews with researchers during the study. In each school, our preference will be for one teacher with less than 3 years' teaching experience and one with greater than 5 years' teaching experience, in order to capture different perspectives (i.e., from those new to teaching and also experienced teachers) and improve generalizability of the study findings.

Students. A participant information statement will be provided to the schools for distribution to all parents/carers. Announcements will also be posted in school newsletters. Schools are to collate any returned withdrawal forms and provide a list of non-withdrawn student registration numbers to the research team. This list will form the participation list; any withdrawn students' survey responses will be omitted.

2.5 Measures

Assessments will be conducted at baseline, 6 months, and 12 months. In addition, the wait-list control group will be followed up at 18 months (see Table 2).

Table 2
Timeline for the Quality Teaching Rounds intervention

Phase	Timing	Task	Research Team A	Research Team B	Independent Researcher	Schools (Group allocation)		
						Set	Choice	Control
		Call for EOI	✓	✓				
		Check eligibility	✓	✓				
		Select schools		✓				
		Observation training	✓					
		Baseline						
		Observations	✓			✓	✓	✓
		Interviews	✓			✓	✓	✓
		Surveys	✓			✓	✓	✓
	2 weeks pre-intervention	Randomisation			✓			
	1 week pre-intervention	QTR workshop		✓		✓	✓	
Intervention	6-month intervention period	Implementation of QTR with fidelity checks		✓		✓	✓	

Phase	Timing	Task	Research Team A	Research Team B	Independent Researcher	Schools (Group allocation)		
						Set	Choice	Control
Post-intervention	Immediately post-intervention	*6-month follow-up*						
		Observations	✓			✓	✓	✓
		Interviews	✓			✓	✓	✓
		Surveys	✓			✓	✓	✓
		Data analysis	✓					
		12 month follow-up						
		Observations	✓			✓	✓	✓
		Interviews	✓			✓	✓	
		Surveys	✓			✓	✓	✓
		Data analysis	✓			✓	✓	✓
		QTR workshop		✓				✓
		Follow-up interviews						✓
		Data analysis	✓					

Note. Research team A blinded to group allocation; Research team B knows group allocation; QTR, Quality Teaching Rounds

2.5.1 Primary outcome measure

Quality of teaching. The primary outcome, quality of teaching (i.e., QT overall and QT dimension scores), will be based on two observations of participating teachers at each time point (i.e., baseline, 6 months, and 12 months) through etic-type observations conducted by members of the research team, blinded to participants' group allocations. Importantly, these observations for the primary outcome measure will take place prior to and after the Quality Teaching Rounds intervention and thus will be kept separate from the peer observations among PLC members. In order to prepare the research team for making reliable assessments of teaching quality, training will take place in the weeks prior to the first assessments, involving review of each element of the QT framework, review of the coding process, and practice coding. For the baseline and follow-up assessments, at least 10% of lessons will be coded independently by two members of the research team and inter-rater reliability will be calculated based on the proportion of agreement for the element scores of the QT framework.

Quality Teaching scoring instrument. The Quality Teaching Classroom Practice Guide (NSWDET, 2003) will be used throughout the study to provide a measure of the quality of teaching. The Quality Teaching scoring instrument and processes have been tested in previous studies with high validity established (Ladwig et al., 2007). Scores from 1 to 5 are generated in response to a focus question for each of the 18 elements of the Quality Teaching framework (see Appendix B), and recorded on a coding sheet (see Appendix C). Specific descriptors of what is happening in a lesson enable those producing the scores to make precise judgements and articulate their decisions. For each lesson, scores within each of the three dimensions will be averaged to produce QT dimension scores out of 5. A QT overall score will be produced as an average of the scores for all 18 elements.

2.5.2 Demographic characteristics

Background details and socio-demographic information for teachers will be collected by questionnaire including sex, age, identification as Aboriginal or Torres Strait Islander, language background, and educational level.

2.5.3 Secondary outcome measures

Teaching details. Teachers will self-report on years of experience in their current school, years of experience as a teacher, employment status (i.e., full-time, part-time, casual), and subject specialisation (if any). In addition, teachers will report on the number of any lessons they have observed and had observed during the past year. The frequency of collaboration with colleagues to share feedback, suggestions, and strategies will also be reported, as will time spent during the work day in planning and preparation. Other survey items form scales that provide estimates of the degree to which teachers: believe there is trust among them (Bryk & Schneider, 2003), believe they take collective responsibility for student learning (Louis & Marks, 1998; Louis, Marks, & Kruse, 1996), receive appraisal and recognition, and have high levels of morale (Hart, Wearing, Conn, Carter, & Dingle, 2000). The survey also uses scales to gauge the degree to which teachers believe that their teaching aligns with the dimensions of Intellectual Quality, Quality Learning Environment, and Significance. Many of these scales have been previously validated and used in other studies (Gore, Bowe, & Elsworth, 2010; Gore & Ladwig, 2006; Watt & Richardson, 2007).

Student data. While students will be observed during normal classes by other teachers participating in Quality Teaching Rounds and/or by researchers, the teacher remains the focus of the study. Nonetheless, at each data collection point, students will complete a survey integrated with their normal classwork. Students will report their sex and year level, their views on the quality of teaching they receive, and their perception of their own achievement. The latter two scales have been used and validated in other studies with acceptable/strong Cronbach alpha scores (Gore et al., 2013). There are three versions

of the student survey to accommodate the various ages of students in the study: Kindergarten to Year 3 (ages 5–9 years), Year 4 to 6 (ages 9–12 years), and Year 7 to 12 (ages 12–18 years, i.e., secondary school).

2.5.4 Teacher interviews

Two teachers from each school will be interviewed by a researcher at each data collection point. For those schools randomised to the wait-list control group, the third time point for data collection (interviews) will occur after they have undertaken their Rounds. These interviews are semi-structured, face-to-face interviews. The interviews focus on issues of teacher identity, teaching culture, and teachers' career plans, as well as experiences of Quality Teaching Rounds. The interviews will typically take around 45 minutes.

2.5.5 In-depth case studies

Six of the 24 schools (two from each group) will be invited to take part in in-depth case studies. This will require the teachers participating in Quality Teaching Rounds taking part in two or three focus groups during the study. The six schools will be chosen to ensure a mix of primary and secondary schools. Principals from the six case study schools will also be interviewed two to three times by a researcher and asked to provide relevant school documents, such as school plans, and professional development activity records and plans.

2.6 Fidelity checks

The following strategies will be employed to enhance and monitor intervention quality. First, the intervention protocols will be outlined at the Quality Teaching Rounds workshops for (at least) the four teachers from each school who will facilitate Rounds in their schools. Second, fidelity checks (two per school) will be conducted by a member of the research team (with the researcher staying for the whole Round on each occasion) to monitor how Quality Teaching Rounds are being conducted and gather inter-rater reliability data on lesson observations comparing researcher QT scores with PLC-agreed QT scores. Third, an online checklist will be completed by each PLC for each Round addressing the degree to which they have complied with the main components of the intervention. This online survey includes eight key items relating to the conduct of the Round (e.g., Did PLC members individually code all QT elements prior to the lesson discussion? How long was the post-lesson discussion?), which mirror the items used for the fidelity checks. A fidelity score will be calculated for each PLC (i.e., level of compliance). As noted in sections 2.1.1 and 2.3, we anticipate some modifications/deviations from protocol to occur as teachers and schools adapt Quality Teaching Rounds to suit their own circumstances and will use these data to inform the analysis.

2.7 Sustainability of intervention

The 12-month follow-up data collection will provide insight into the sustainability of any impact on the quality of teaching, and other measures, after the intervention period ceases. Our concern is to develop a sustainable model for the development of teaching quality, in this instance in association with the NSWDEC. This kind of "translational" research, where the views of the stakeholders who are implementing an intervention are incorporated into subsequent theory and intervention design, has been deemed the most effective way to bridge the research-to-practice divide and ensure the continuation and improvement of effective approaches (Park & Peterson, 2009). Furthermore, the "RE-AIM" Framework will be applied. This framework, often used in public health research, is comprised of five evaluative components that describe the overall population-based impact of an intervention: Reach, Efficacy, Adoption, Implementation, and Maintenance (Glasgow, Vogt, & Boles, 1999). The use of this

framework will help in facilitating the translation of this research, and potential adoption and broader application in teacher professional development.

2.8 Process evaluation

Teachers will complete process evaluation questionnaires at the end of the intervention to determine their satisfaction with Quality Teaching Rounds. The process evaluation will be modified for the control group and administered at the 18-month time point.

2.9 Data analysis

The study has been designed to provide both quantitative and qualitative data. Statistical analyses of the primary and secondary outcomes will be conducted with linear mixed models using IBM SPSS Statistics for Windows, Version 22.0 (2010 SPSS Inc., IBM Company Armonk, NY) and alpha levels will be set at $p < .05$. The models will be used to assess the impact of the two interventions (QTR-Set or QTR-Choice), time (treated as categorical with levels baseline, 6-months, and 12-months), and group-by-time interaction, these three terms forming the base model. The models will be specified to adjust for the clustered nature of the data (i.e., teachers located within schools) and the multiple observations conducted at each time point using random intercepts. Linear mixed models have the advantage of being robust to the biases of missing data and provide appropriate balance of Type 1 and Type 2 errors (Mallinckrodt, Watkin, Molenberghs, Carroll, & Lilly, 2004). Mixed model analyses are consistent with the intention-to-treat principle, assuming the data are missing at random (White, Carpenter, & Horton, 2012). Moderators of intervention effects will be explored using linear mixed models with interaction terms for the following: (a) type of school (primary versus secondary), (b) SES (based on school Index of Community Socio-Educational Advantage (ICSEA) values), (c) geographic location of school (urban versus rural), (d) years of teaching experience, and (e) sex of teacher. Subgroup analyses will be conducted if significant interaction effects ($p < .1$) are identified (Assmann, Pocock, Enos, & Kasten, 2000).

Per-protocol analyses will be performed for those PLCs that met at least five of the eight pre-specified standards (based on fidelity checks), namely that: a professional reading session was conducted; PLC members were present throughout the lesson; PLC members individually coded all Quality Teaching elements prior to the lesson discussion; the post-lesson discussion was at least 60 minutes in duration; the host teacher was included in the discussion; PLC members were present throughout the discussion; PLC members provided their codes and justification using evidence from the lesson for each QT element; and, the Quality Teaching Classroom Practice Guide was a consistent point of reference throughout the discussion.

Qualitative analyses will be conducted using NVivo (QSR International, 2014). These analyses will be used to explore: (1) what aspects of the intervention were most valued by the participants; (2) what, how, and why the intervention made an impact on which teachers and students; (3) how differences in each intervention group interacted with teaching culture, teacher identity, and teachers' career plans and aspirations; and (4) how differences in intervention groups relate to issues of implementation and scalability.

Because the intervention will vary (between groups, schools, PLCs, and teachers), the design of the study captures sufficient multiple points of evidence to allow comparisons across these differences in a triangulated fashion. Each of these comparisons is linked with some level of "emic" qualitative accounting. Thus the study will be able to complement all of its quantitative modelling with qualitative evidence, over time and treatments, and vice versa. School profiles will be developed for six schools across the three groups, providing opportunities for the depth of analysis produced in the triangulation

of findings across all sources of data to be readily shared with partner organisations and the education community more broadly.

3. Discussion

An emerging body of research has shown that significant professional learning experiences like QT Rounds have the capacity to shape and "anchor" teachers' professional identities (Mockler, 2011) and bolster professional resilience, for both beginning and mid-career teachers (Day & Kington, 2008; Pillen, Beijaard, & den Brok, 2012), helping redress critical problems of attrition and morale. Very few studies have been able to demonstrate approaches to professional learning that deliver on the tripartite goals of teacher learning, teaching quality, and student learning (Vescio et al., 2008) and none have traversed the teaching sector (primary/secondary), subject areas, and years of experience (first-year teacher to highly experienced) ranges that will be investigated in this study.

By investigating the interplay of teaching culture, teacher identity, career commitment, and collaborative professional learning through Quality Teaching Rounds, using a purposeful merger of experimental and qualitative forms of evidence, this study has the potential to play a world-leading role in the field of teacher professional development. Our previous studies of Quality Teaching Rounds have not systematically examined the mechanisms by which the approach works or how it works differently for different teachers. Nor have we had a large enough sample to use the kind of experimental design that can stand up to full scrutiny around questions of validity and statistical power. The approach detailed in this paper is central to successful replication in other jurisdictions nationally and internationally, using the Quality Teaching framework or other pedagogical frameworks. It is also critical in influencing government, policy, and educational system decisions about investments in teacher learning.

4. Conclusion

This paper describes and justifies the protocol for a three-arm cluster randomised controlled trial of Quality Teaching Rounds. The study is designed to establish the capacity for professional development to impact on teaching quality in a way that has so far largely eluded educational researchers. For the NSWDEC and other potential end-users, the applicability of the Quality Teaching Rounds approach to teaching in various contexts and with students from diverse backgrounds holds great promise as an adaptable, focussed, and sustainable platform for professional learning capable of supporting whole-system reform.

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Conflicts of interest

The authors report no conflicts of interest.

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References

Amosa, W., Ladwig, J., Griffiths, T., & Gore, J. (2007). *Equity effects of Quality Teaching: Closing the gap*. Paper presented at the annual conference of the Australian Association for Research in Education, Fremantle, Australia.

Assmann, S. F., Pocock, S. J., Enos, L. E., & Kasten, L. E. (2000). Subgroup analysis and other (mis)uses of baseline data in clinical trials. *Lancet, 355*(9209), 1064–1069. doi:10.1016/s0140-6736(00)02039-0

Aubusson, P., Steele, F., Dinham, S., & Brady, L. (2007). Action learning in teacher learning community formation: Informative or transformative? *Teacher Development, 11*(2), 133–148.

Avalos, B. (2011). Teacher professional development in Teaching and Teacher Education over ten years. *Teaching and Teacher Education, 27*(1), 10–20. doi:10.1016/j.tate.2010.08.007

Blase, J. J. (1988). The everyday political perspective of teachers: vulnerability and conservatism. *International Journal of Qualitative Studies in Education, 1*(2), 125–142.

Bowe, J., & Gore, J. (under review). *Re-assembling teacher professional development: The case for Quality Teaching Rounds*.

Bryk, A. S., & Schneider, B. (2003). Trust in schools: A core resource for school reform. *Educational Leadership, 60*(6), 40–45.

Carter, A. (2015). *Carter review of initial teacher training (ITT)*. Report prepared for the UK Secretary of State for Education. Retrieved February 16, 2015 from https://www.gov.uk/government/publications/carter-review-of-initial-teacher-training

City, E. A., Elmore, R. F., Fiarman, S. E., & Teitel, L. (2009). *Instructional rounds in education: A network approach to improving teaching and learning*. Cambridge, MA: Harvard Education Press.

Cochran-Smith, M., & Fries, K. (2005). The AERA panel on research and teacher education: Context and goals. In M. Cochran-Smith, & K. M. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (pp. 37–68). Mahwah, NJ: Lawrence Erlbaum.

Cochran-Smith, M., & Zeichner, K. M. (Eds.). (2005). *Studying teacher education: The report of the AERA panel on research and teacher education*. Mahwah, NJ: Lawrence Erlbaum.

Day, C., & Kington, A. (2008). Identity, well-being and effectiveness: The emotional contexts of teaching. *Pedagogy, Culture and Society, 16*(1), 7–23.

Day, C., & Smethem, L. (2009). The effects of reform: Have teachers really lost their sense of professionalism? *Journal of Educational Change, 10*(2), 141–157.

Dorman, J. (2003). Testing a model for teacher burnout. *Australian Journal of Educational and Developmental Psychology, 3*, 35–47.

DuFour, R. (2004). What is a "Professional Learning Community"? *Educational Leadership, 61*(8), 6–11.

Ewing, R., Groundwater-Smith, S., Mockler, N., Loughland, T., Simpson, A., Smith, D., . . . Brooks, D. (2010). *Meta analysis of Quality Teaching Action Learning Project, 2003–2009*. Sydney, Australia: University of Sydney. Retrieved February 18, 2014 from http://sydney.edu.au/education_social_work/professional_learning/resources/papers/AGQTP_reports/2010_MetaAnalysis_Quality_Teaching_Action_Learning_Project.pdf

Feuer, M. J., Towne, L., & Shavelson, R. J. (2002). Scientific culture and educational research. *Educational Researcher, 31*(8), 4–14.

Flores, M. A., & Day, C. (2006). Contexts which shape and reshape new teachers' identities: A multi-perspective study. *Teaching and Teacher Education, 22*(2), 219–232.

Flyvbjerg, B. (2006). Five misunderstandings about case study research. *Qualitative Inquiry, 12*(2), 219–245.

Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health, 89*(9), 1322–1327.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2004). Collective efficacy beliefs: Theoretical developments, empirical evidence, and future directions. *Educational Researcher, 33*(3), 3–13.

Gorard, S. (2010). Serious doubts about school effectiveness. *British Educational Research Journal, 36*(5), 745–766.

Gore, J. M. (2007). Improving pedagogy: Challenges of moving teachers toward higher levels of Quality Teaching. In J. Butcher & J. Asha (Eds.), *Making a difference: Challenges for teachers, teaching, and teacher education* (pp. 15–33). New York, NY: Sense.

Gore, J. M. (2014a). Effective implementation of pedagogical reform through Quality Teaching Rounds. In *What counts as quality in education? Proceedings of the Annual National Conference of the Australian College of Educators (ACE)* (pp. 16–21). Melbourne, Australia: ACE.

Gore, J. M. (2014b). Towards quality and equity: The case for Quality Teaching Rounds. In *Quality and Equity: What does research tell us? Proceedings of the Australian Council for Educational Research (ACER) Research Conference* (pp. 86–91). Melbourne, Australia: ACER.

Gore, J. M., Bowe, J., & Elsworth, W. (2010). *Examining the impact of Quality Teaching Rounds on teacher professional learning*. Paper presented at the Australian Association for Research in Education annual conference, Melbourne, Australia.

Gore, J. M., Bowe, J., Mockler, N., Smith, M., Ellis, H., & Lyell, A. (2013). *Investigating 'Quality Teaching Rounds' to support teacher professional learning* (Research report prepared for the ACT Education and Training Directorate). Newcastle, Australia: The University of Newcastle.

Gore, J. M., Griffiths, T., & Ladwig, J. G. (2004). Towards better teaching: productive pedagogy as a framework for teacher education. *Teaching and Teacher Education, 20*(4), 375–387. doi:10.1016/j.tate.2004.02.010

Gore, J. M., & Ladwig, J. G. (2006). *Professional development for pedagogical impact*. Paper presented at the annual conference of the Australian Association for Research in Education, Adelaide, Australia.

Hammond, J. (2008). Intellectual challenge and ESL students: Implications of quality teaching initiatives. *Australian Journal of Language and Literacy, 31*(2), 128–154.

Hart, P. M., Wearing, A. J., Conn, M., Carter, N. L., & Dingle, R. K. (2000). Development of the School Organisational Health questionnaire: A measure for assessing teacher morale and school organisational climate. *British Journal of Educational Psychology, 70*(2), 211–228. doi:10.1348/000709900158065

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.

Hawley, W. D., & Valli, L. (1999). The essentials of effective professional development: A new consensus. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 127–150). San Francisco, CA: Jossey-Bass.

Hoy, A. W., Hoy, W. K., & Kurz, N. M. (2008). Teacher's academic optimism: The development and test of a new construct. *Teaching and Teacher Education, 24*(4), 821–835.

Imants, J., & van Veen, K. (2010). Teacher learning as workplace learning. In E. Baker, B. McGaw, & P. Peterson (Eds.), *International encyclopedia of education* (3rd ed., pp. 569–574). Oxford, UK: Elsevier.

Ingersoll, R. M., & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Educational Leadership, 60*(8), 30–33.

Jensen, B., Hunter, A., Sonnemann, J., & Burns, T. (2012). *Catching up: Learning from the best school systems in East Asia*. Retrieved February 16, 2015 from Grattan Institute website: http://grattan.edu.au/wp-content/uploads/2014/04/129_report_learning_from_the_best_main.pdf

King, M. B., & Bouchard, K. (2011). The capacity to build organizational capacity in schools. *Journal of Educational Administration, 49*(6), 653–669.

Ladwig, J. G., Smith, M., Gore, J., Amosa, W., & Griffiths, T. (2007). *Quality of pedagogy and student achievement: Multi-level replication of authentic pedagogy*. Paper presented at the annual conference of the Australian Association for Research in Education, Fremantle, Australia.

Lewis, C. (2015). What is improvement science? Do we need it in education? *Educational Researcher, 44*(1), 54–61. doi:10.3102/0013189x15570388

Little, J. W. (2006). *Professional community and professional development in the learning-centered school*. Arlington, VA: National Education Association.

Louis, K. S. (2006). Changing the culture of schools: Professional community, organizational learning, and trust. *Journal of School Leadership, 16*(5), 477.

Louis, K. S., & Marks, H. M. (1998). Does professional community affect the classroom? Teachers' work and student experiences in restructuring schools. *American Journal of Education, 106*(4), 532–575. doi:10.2307/1085627

Louis, K. S., Marks, H. M., & Kruse, S. (1996). Teachers' professional community in restructuring schools. *American Educational Research Journal, 33*(4), 757–798.

Mallinckrodt, C. H., Watkin, J. G., Molenberghs, G., Carroll, R. J., & Lilly, E. (2004). Choice of the primary analysis in longitudinal clinical trials. *Pharmaceutical Statistics, 3*, 161–169.

McKenzie, P., Santiago, P., Sliwka, P., & Hiroyuki, H. (2005). *Teachers matter: Attracting, developing and retaining effective teachers*. Paris, France: OECD.

Mockler, N. (2011). Beyond 'what works': Understanding teacher identity as a practical and political tool. *Teachers and Teaching, 17*(5), 517–528.

Moher, D., Hopewell, S., Schulz, K. F., Montori, V., Gøtzsche, P. C., Devereaux, P. J., . . . Altman, D. G. (2010). *CONSORT 2010* Explanation and elaboration: Updated guidelines for reporting parallel group randomised trials. *British Medical Journal, 340*, c869. doi:10.1136/bmj.c869

Murray, D. M. (1998). *Design and analysis of group-randomized trials*. New York, NY: Oxford University Press.

Newmann & Associates. (1996). *Authentic achievement: Restructuring schools for intellectual quality*. San Francisco, CA: Jossey Bass.

Newmann, F. M., King, M. B., & Youngs, P. (2000). Professional development that addresses school capacity: Lessons from urban elementary schools. *American Journal of Education, 108*(4), 259–299.

NSW Department of Education and Training (NSWDET). (2003). *Quality Teaching in NSW public schools*. Sydney, Australia: NSWDET.

Özer, N., & Beycioglu, K. (2010). The relationship between teacher professional development and burnout. *Procedia-Social and Behavioral Sciences, 2*(2), 4928–4932.

Park, N., & Peterson, C. (2009). Achieving and sustaining a good life. *Perspectives on Psychological Science, 4*(4), 422–428.

Penney, D., Brooker, R., Hay, P., & Gillespie, L. (2009). Curriculum, pedagogy and assessment: Three message systems of schooling and dimensions of quality physical education. *Sport, Education and Society, 14*(4), 421–442. doi:10.1080/13573320903217125

Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher, 40*(7), 331–337. doi:10.3102/0013189x11421826

Pillen, M., Beijaard, D., & den Brok, P. (2012). Tensions in beginning teachers' professional identity development, accompanying feelings and coping strategies. *European Journal of Teacher Education, 36*(3), 240–260. doi:10.1080/02619768.2012.696192

Plummer, F., Nyholm, M., Quince, S., & Dione, M. (2010). Innovative practice in middle years literacy: A New South Wales perspective on professional learning. *Literacy Learning: The Middle Years, 18*(2), 31.

QSR International. (2014). *NVivo* (Version 10.0.638.0 SP6). Doncaster, Victoria: QSR International.

Rushton, K. (2008). Cooperative planning and teaching for ESL students in the mainstream classroom. *TESOL in Context, 18*(1), 21.

Teacher Education Ministerial Advisory Group. (2014). *Action now: Classroom ready teachers* (Report prepared for the Australian Government Department of Education and Training). Canberra, Australia: TEMAG. Retrieved February 13, 2015 from http://www.studentsfirst.gov.au/teacher-education-ministerial-advisory-group

Treble, V. (2009). 'A love of teaching and learning': A case study of English teaching transformed through quality teaching and professional learning. *Teacher Development, 13*(4), 363–371. doi:10.1080/13664530903578280

Tschannen-Moran, M., & Hoy, A. W. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education, 23*(6), 944–956.

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education, 24*(1), 80–91.

Watt, H. M. G., & Richardson, P. W. (2007). Motivational factors influencing teaching as a career choice: Development and validation of the FIT-Choice scale. *The Journal of Experimental Education, 75*(3), 167–202. doi:10.3200/JEXE.75.3.167-202

White, I. R., Carpenter, J., & Horton, N. J. (2012). Including all individuals is not enough: Lessons for intention-to-treat analysis. *Clinical Trials, 9*(4), 396–407. doi:10.1177/1740774512450098

Wilson, S. M., Floden, R. E., & Ferrini-Mundy, J. (2001). *Teacher preparation research: Current knowledge, gaps, and recommendations* (Report prepared for the US Department of Education and the Office for Educational Research and Improvement). Washington, DC: Center for the Study of Teaching and Policy. Retrieved February 16, 2015 from https://depts.washington.edu/ctpmail/PDFs/TeacherPrep-WFFM-02-2001.pdf

Appendix A. The Quality Teaching framework (Adapted from NSWDET, 2003).

		Elements	Coding scale question
Dimensions		Deep knowledge	To what extent is the knowledge being addressed focused on a small number of key concepts and the relationships between them?
		Deep understanding	To what extent do students demonstrate a meaningful understanding of central ideas and the relationships between and among those ideas?
		Problematic knowledge	To what extent are students encouraged to recognise multiple perspectives and solutions? To what extent are students able to recognise knowledge as constructed and therefore open to question?
		Higher-order thinking	To what extent are students regularly engaged in thinking that requires them to organise, reorganise, apply, analyse, synthesise and evaluate knowledge and information?
		Metalanguage	To what extent do lessons explicitly name and analyse knowledge as a specialist language? To what extent do lessons provide frequent commentary on language use and the various contexts of differing language uses?
		Substantive communication	To what extent are students regularly engaged in sustained communication (in oral, written or artistic forms) about the ideas and concepts they are encountering?
		Explicit quality criteria	To what extent are students provided with explicit criteria for the quality of work they are to produce? To what extent are those criteria a regular reference point for the development and assessment of student work?
		Engagement	To what extent are most students, most of the time, seriously engaged in the lesson? To what extent do students display sustained interest and attention?
		High expectations	To what extent are high expectations of all students communicated? To what extent is conceptual risk taking encouraged and rewarded?
		Social support	To what extent is there strong positive support for learning and mutual respect among teachers and students and others assisting students' learning? To what extent is the classroom free of negative personal comment or put-downs?
		Students' self-regulation	To what extent do students demonstrate autonomy and initiative so that minimal attention to the disciplining and regulation of student behaviour is required?
		Student direction	To what extent do students exercise some direction over the selection of activities related to their learning and the means and manner by which these activities will be done?
		Background knowledge	To what extent do lessons regularly and explicitly build from students' background knowledge, in terms of their prior school knowledge, as well as other aspects of their personal lives?
		Cultural knowledge	To what extent do lessons regularly incorporate the cultural knowledge of diverse social groupings?
		Knowledge integration	To what extent do lessons regularly demonstrate links between and within subjects and key learning areas?
		Inclusivity	To what extent do lessons include and publicly value the participation of all students across the social and cultural backgrounds represented in the classroom?
		Connectedness	To what extent do lesson activities rely on the application of school knowledge in real-life contexts or problems? To what extent do lesson activities provide opportunities for students to share their work with audiences beyond the classroom and school?
		Narrative	To what extent do lessons employ narrative to enrich student understanding?

Appendix B. Sample coding guidelines adapted from the Quality Teaching Classroom Practice Guide (NSWDET, 2003).

Element: Social support

Description

Classrooms high in social support for student learning encourage all students to try hard and risk initial failure in a climate of mutual respect. Classrooms high in social support are characterised by teacher and student behaviours, comments and actions that encourage and value effort, participation, and the expression of one's views in the pursuit of learning. If disagreement or conflict occurs in the classroom, it is resolved in a constructive way for all concerned.

Classrooms low in social support are characterised by teacher or student behaviours, comments and actions that discourage effort, participation and taking risks to learn or express one's views. For example, teacher or student comments that belittle a student's response, and efforts by some students to prevent others from taking seriously an activity, serve to undermine support for learning. Social support can also be absent in a class when no overt acts like the above occur, but the overall atmosphere of the class is negative.

Focus question: To what extent is there strong positive support for learning and mutual respect among teachers and students and others assisting students' learning? To what extent is the classroom free of negative personal comment or put-downs?

Coding scale

1. Social support is low. Actions or comments by the teacher or students result in "put-downs", and the classroom atmosphere is negative.
2. Social support is mixed; both undermining and supportive behaviours or comments are observed.
3. Social support is neutral or mildly positive. While no undermining behaviours are observed, supportive behaviours or comments are directed at those students most engaged in the lesson, rather than those students who are more reluctant.
4. Social support is clearly positive. Supportive behaviours and comments are directed at most students, including clear attempts at supporting reluctant students.
5. Social support is strong. Supportive behaviours or comments from students and the teacher are directed at all students, including soliciting and valuing the contributions of all.

Notes

1. The teacher has the responsibility for setting the tone in the classroom by creating and maintaining a mutually respectful environment. The core business of the classroom is student learning, and this will be most productive in an atmosphere that is both supportive of students and supportive of their learning.
2. A behaviour in and of itself may be either negative or supportive, depending on the context and power dynamics within the particular classroom.

Appendix C. Quality Teaching coding sheet.

Intellectual Quality

1.1 Deep knowledge	1	2	3	4	5
1.2 Deep understanding	1	2	3	4	5
1.3 Problematic knowledge	1	2	3	4	5
1.4 Higher-order thinking	1	2	3	4	5
1.5 Metalanguage	1	2	3	4	5
1.6 Substantive communication	1	2	3	4	5

Quality Learning Environment

2.1 Explicit quality criteria	1	2	3	4	5
2.2 Engagement	1	2	3	4	5
2.3 High expectations	1	2	3	4	5
2.4 Social support	1	2	3	4	5
2.5 Students' self-regulation	1	2	3	4	5
2.6 Student direction	1	2	3	4	5

Significance

3.1 Background knowledge	1	2	3	4	5
3.2 Cultural knowledge	1	2	3	4	5
3.3 Knowledge integration	1	2	3	4	5
3.4 Inclusivity	1	2	3	4	5
3.5 Connectedness	1	2	3	4	5
3.6 Narrative	1	2	3	4	5