AERA 2021
SIG-Data-Driven Decision Making in Education

Title:
Using colleague coaching to develop teacher data literacy

Abstract
This paper reports on teachers developing their own data literacy and then acting as data coaches for colleagues in their schools. The 13 teachers from 8 schools in the study analysed standardised data using a data conversation protocol, identified students with significant mathematical misconceptions and took data-informed action with these students. Through this inquiry process they developed confidence to act as data coaches with a small number of colleagues. By positioning themselves as co-learners with their coachees the teacher-coaches circumvented school power dynamics. Instead they drew authority from their own inquiries using the data conversation protocol. Nonetheless, some faced challenges when coachees were assigned to the process and or the formative intent of data use was not clear to coachees.

1. Objectives or purposes
Teachers need to be able to 'zoom in' on student achievement data to consider the strengths and needs of individual students. This relies on teachers being *data literate,* that is, having the "ability to set a purpose, collect, analyse, and interpret data, and take instructional action" (Kippers, Poortman, Schildkamp, & Visscher, 2018, p.21), which, in turn, relies on a combination of data, curricular, and pedagogical knowledge (e.g. processes for data collection and analysis, knowledge of children's likely learning progressions, pedagogical content knowledge, knowledge of the children they are teaching - see Mandinach, Friedman, & Gummer, 2015). Despite increasing policy and commercial interest in evidence-based practice, international research consistently reports that many educators do not make effective use of the student data they collect (Mandinach et al., 2015; Kippers et al., 2018). Our study sought to explore the nature of effective development and support for teachers as data coaches of their colleagues as a strategy for developing a school culture of proactive data use.

2. Perspective(s) or theoretical framework
Within New Zealand, the Education Review Office (ERO) have expressed the need for teacher data literacy and their concern about current levels of teacher data literacy (ERO, 2017). Our earlier work has shown that teacher professional practice has not kept pace with data literacy demands, with teachers expressing the view that development of data literacy needs to be a collaborative process (Peter, Cowie, Edwards, Eyers & Adam, 2017; see also Hermansen & Nerland, 2014; Kippers et al., 2018; Wyatt-Smith & Klenowski, 2014). In the current study we are focused on how data literacy capacity can be developed through the use of peer coaching, specifically in and for primary/ elementary school mathematics. We explore the use of a data conversation protocol adapted from Dalton and Anderson (2016) (earlier reported in Cowie, Edwards & Trask, 2020) and discussion of data in cross school meetings to initiate and build data-use capacity in teacher colleagues.

3. Methods, techniques, or modes of inquiry
The project from which the data for this paper is drawn is a two year project that used a design-based implementation research approach (Penuel, Fishman, Cheng, & Sabell, 2011). This approach is distinguished by (a) a focus on persistent problems of practice from

multiple stakeholders' perspectives; (b) a commitment to iterative, collaborative design; (c) a concern with developing theory related to both classroom learning and implementation through systematic inquiry; and (d) a concern with developing capacity for sustaining change in a system. The problem of interest was how to optimise data use for the math teaching and learning purposes of a small group of interested teachers and then to scale out in-school data use through the process of data coaching. The proposition was that through the project the initial group of teachers would have access to relationships and resources and develop the confidence needed to act as data coaches for their colleagues, thereby contributing to a focus on building a culture of data use across their school and, in the longer term, a cluster of schools.

Initially we worked with a core group of 15 teachers from 8 schools from a 16-school learning community from the same geographical area in New Zealand to develop the knowledge and practices they needed to use data independently and to develop their capability to act as data coaches. During the regular meetings and workshop days (seven days in total in 2019 and 6 days in 2020) teachers developed their understanding of data literacy and explored the use of a data conversation protocol, adapted from Dalton and Anderson (2016) (earlier reported in Cowie, Edwards & Trask, 2020). The data conversation protocol assisted them in analysing and acting on their own students' math assessment data when this was aggregated at the individual, class and school levels. The protocol provided a common ground for teachers to share interpretations of patterns in data, as well as strategies for action.

At the same time, teachers and researchers worked together to plan and pilot materials for use in coaching sessions. Teachers prepared for their coaching roles through their involvement in scaffolded discussions, activities and readings to interrogate ideas about coaching conversations and relationship management, and assumptions about data use.

The teachers then joined with coachees who were a colleague or small group of colleagues from the same school. Teachers worked with coachees to:

- Discuss definitions for data literacy and why being data literate might be important
- Familiarise coachee/s with the data conversation protocol (DCP)
- Link the data conversation protocol to action steps in coachee teacher inquiries
- Support the coachee/s to unpack/analyse data and develop strategies for targeted instructional action (Here's what, so what, now what steps in DCP)
- Reflect on action and building of data-use capacity in colleagues and student learning/development of student agency

Coach teachers were asked to collect evidence of their work with their coachee in the form of minutes of meetings, materials used or produced including data used and plans made, coachee reflections on action and critique of the data conversation protocol process. Following coaching activities teachers met as a group to report back and reflect on and share experiences.

4. Data sources, evidence, objects, or materials

The teachers participated in the study with the active consent of their principals and their multi-school learning community. Data was collected by audio recordings from teacher meetings and workshops where teachers reported on their work own actions using data and on their work with coachees, and resultant outcomes. Other data sources included the PowerPoints the teachers developed to share their experiences with colleagues, written case studies in which the teachers reflected on their work with their coachees, including perceived impact, and one to one interviews with the teachers to further interrogate their experiences and observations about data use and the culture of data use in their schools.

5. Results and/or substantiated conclusions or warrants for arguments/point of view

Data showed that the following aspects were important in the **colleague coaching** process :

(i) Coaches viewed themselves as teachers helping other teachers as co-learners

The teacher coaches viewed themselves as being "on the same level" or as "just teachers helping teachers" and "not always having all the answers" but co-learning with their coachees. Thus they were able to some extent circumvent issues of school-based organisational power: "Not being in the senior leadership team puts the power balance in a different place." The teacher coaches considered this meant that they were approachable which enhanced their ability to have open dialogue. A typical comment was:

"Because I don't have any official leadership role in the school, they feel quite comfortable to come to me. They'll come and ask me, 'What do I do about this?' I'm not their boss in any shape or form, I'm there to help them."

(ii) Teacher coach authority was based on personal experience and collectively developed resources

The teacher coaches saw their comfortable, equitable insider relationships with colleagues as having unfavourable as well as favourable consequences. Sometimes they felt as if they were working to balance or tread a fine line between approachability and credibility in the sense of "I'm also just a teacher" when trying to get buy-in from coachee colleagues. They worried that coachees would think "Who the hell does she think she is?", and felt they needed some basis for their authority as a coach as well as confidence to do so.

Teachers' confidence as coaches grew as they realised that "Oh, I know that! They don't." That is, they came to appreciate and draw on the authority of their own learning and experience which had been developed during workshop sessions and through their own inquiries using the protocol. They also benefited from their demonstrated public commitment to the value of data use through being part of a research project, which offered additional status to them in their role.

As data coaches, teachers noted the need to "understand the assessment task, how to administer it, how to analyse" and be able to support teachers to use data to inform their teaching and improve student learning. They found the data conversation protocol, as a facilitation tool for conversation, useful. Effective coaching practices included modelling - showing coachees how to look at and interpret data using the think aloud strategies of the protocol, suggesting and discussing strategies for next teaching and learning steps, and modelling how to work with students. An effective practice was for the coachee to watch the coach working with the coachee's students and then discuss what had happened.

However, the teachers continued to describe themselves as co-learners, and because they understood coachees' fear of being exposed as 'not knowing' they were careful to remain non-judgemental and to keep the focus on the data. The teacher coaches reported they reminded themselves that they were critiquing the data, student responses and possible reasons for these as well as what might be contributing teaching strategies. They emphasised the need to be clear with their coachee that the focus was *not* on them as a teacher.

(iii) Challenges and the benefit of hindsight - it is not all smooth sailing

In hindsight coaches could have had better prepared for the coaching role and for challenges they might encounter. They experienced a level of vulnerability with their strengths and weaknesses on show, and felt the need to keep a focus on learning together - "we're just both teachers". Other concerns included how to have difficult conversations in a

respectful way, keeping the interests of students to the fore. There were challenges in being realistic about the amount of progress that could be made at any one time with students, and with agreeing realistic time frames for action with their coachee/s.

Some aspects were out of coach's control. In some schools, senior leadership nominated coachees on the basis of perceived need and level of teaching experience, for example, teachers new to the school, beginning teachers or recent immigrants to New Zealand. These coachees were not volunteers and teachers had to carefully navigate the coaching relationship and coachee expectations for data inquiry. In this case, coaches were surprised at the time required to build enthusiasm for data analysis and use. Enthusiasm was developed as coachees came to understand the focus for and benefits for student learning of them developing data literacy.

Teacher coaches' recommendations for subsequent coaching action included:

- protected time for collaborative work
- conducting the data inquiry process with a small targeted group of students (3-4) in the first instance
- visible support and understanding from senior leadership
- coaches having experience with the data inquiry cycle using the DCP
- a focus on questioning conversations rather than a telling approach
- data inquiry coaching positioned as, "This is just what we do - how can I change my practice to do better for my students?" and not professional development

6. Scientific or scholarly significance of the study

"Armed with our classroom journey [own teacher inquiry], full of motivation, backed up with relevant research our team of two started to 'zoom out' passing on and coaching other staff members to join our journey. This involved critical and constructive data sharing and analysing. But most of all it relied on teacher trust and a willingness to put oneself under the microscope, to show our knowledge of data literacy but also pledge honesty to what we do with it and with what degree we use this information." [Teacher case study reflection]

Teachers coaching colleagues in data use using a data conversation protocol and drawing on their own relevant experience of the benefits can be used to build colleagues' data literacy and action on data. Teacher coaches working alongside colleagues depowers coaching interactions but comes with the challenge of establishing credibility, especially if colleagues have not volunteered. One-to-one colleague coaching means coaches have the ability to be flexible and adapt to the needs of coachees. Ideally, the process, in the project teacher coaches view, should lead to coachee's /colleagues' realisation that "once you understand the process of using data to inform your teaching and you can do it confidently, it's not so formal, it becomes part of your planning."

References

Cowie, B., Edwards, F. & Trask, S. (2020, Apr 17 - 21) *The Value of Data Conversation Protocol for Zooming In on Student Thinking* [Roundtable Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/rhsqsrt (Conference Canceled)

Dalton, J., & Anderson, D. (2016). *Learning talk: Important conversations at work*. Victoria, Australia: Hands on Education Consultancy.

Education Review Office (ERO). (2017, January, 17). *Communities of learning | Kāhui Ako: Collaboration to improve learner outcomes.* http://www.ero.govt.nz/publications/communities-of-learning-kahui-ako-collaboration-to-improve-learner-outcomes/

Hermansen, H. Y., & Nerland, M. (2014). Reworking practice through an AfL project: An analysis of teachers' collaborative engagement with new assessment guidelines. *British Educational Research Journal, 40,* 187-206.

Kippers, W. B., Poortman, C. L., Schildkamp, K., & Visscher, A. J. (2018). Data literacy: What do educators learn and struggle with during a data use intervention? *Studies in Educational Evaluation, 56*, 21-31.

Mandinach, E. B., Friedman, J. M., & Gummer, E. S. (2015). How can schools of education help to build educators' capacity to use data? A systemic view of the issue. *Teachers College Record 117*(4), 1–50.

Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabell, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher,* 40,331–337.

Peter, M., Cowie, B., Edwards, F., Eyers, G., & Adam, A. (2017). *Beyond pretty charts: From student data to pedagogical action*. Retrieved from http://bit.ly/2q3he1R

Wyatt-Smith, C., & Klenowski, V. (2014). Elements of better assessment for the improvement of learning. In C, Wyatt-Smith, V. Klenowski, & P. Colbert, (Eds.), *Designing assessment for quality learning* (pp. 195–210. Dorchester, The Netherlands: Springer.