Collaboration around observation of teaching: Powerful professional learning

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This study investigated a group of six junior primary school teachers' learning as they collaboratively inquired into teaching practice they observed together. The focus of the study was on understanding how teachers collaborated around observed teaching practice to improve their pedagogy. The design involved four iterative stages of co-planning, observation, analysis and reflection. Results indicated a shift in participation of group members from seeing themselves as passive observers to active designers proposing improvements in teaching practice to their colleagues. An implication is that collaborative observation and reflection on teaching situated within the enactment of challenging tasks can be effective in supporting teachers to make sense of teaching in new ways.

Introduction

The current focus on practice based professional learning for teachers (Bass & Ball, 2014; Naik & Ball, 2014; Timperley, 2015) raises an important question: How do teachers effectively collaborate to improve teaching and learning? My experience as a teacher and teacher leader across grades, schools, geographic regions and organisations is that many teachers continue to work in isolation. Though I have observed some exceptional teaching practice within schools, I am often left thinking "if only this could be shared". However, when collaboration between teachers is timetabled into the school day, the allocated time is often focused on administrative issues such as playground duty rosters or excursions. My experience is that without a clear purpose, structure and protocols, teachers find it difficult to focus.

Collaboration amongst teachers involves learning together in communities of practice where new ideas can be tried out and reflected upon and new knowledge about teaching and learning can be co-constructed within the context of classroom experiences (Butler, Lauscher, Jarvis-Selinger, & Beckingham, 2004). Borko, Jacobs, Eiteljorg, and Pittman (2008) argue that collaboration is an important component of high quality professional learning for teachers.

Theoretical perspective on learning

In examining this further, a "*situated"* perspective of knowledge, thinking and learning was adopted. In this, learning is constructed through social interaction, it takes place in meaningful contexts and is distributed across others and artefacts. Through social interaction, individuals learn the ways of thinking and behaving that are valued by the community of practice (Putnam & Borko, 2000; Borko et al., 2008; Lave & Wenger, 1991). One form of social interaction is a professional conversation. Timperley (2015) argues it is these "conversations that transform the information and artefacts into actionable knowledge" (p.4). She also contends that collaboration is only possible through the mediation of a "knowledgeable other" or "expert teacher". However, she further highlights that there is a need for research to examine the impact of these conversations in communities of practice.

Examples of meaningful contexts include classrooms, group settings with a focus on teacher practice and other contexts focussed on teachers' own learning. The various contexts enable different types of knowing, the most appropriate way depends on the goal for teacher

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learning (Putnam & Borko, 2000). For example, "experiences situated in the teachers' own classrooms may be better suited to facilitating teachers' enactment of specific instructional practices" (Putnam & Borko, 2000, p. 7). This suggests observing lessons in real time classrooms may support teachers to enact particular pedagogies.

Artefacts such as videos of teaching practice are widely used in teacher professional learning. For example, Borko et al. (2008) claim videos are authentic representations that enable complex analyses of aspects of teaching and student thinking. Similarly, a small number of recent studies have proposed that watching modelled lessons supports teachers to notice intangible aspects of practice and see how effective teachers enact particular pedagogies (Hodgson, 2013). *Noticing* is concerned with what teachers attend to in the moment of teaching and how they make sense of their observations (Van Es, 2012). Likewise, in a discussion of the nature of mathematics teaching and learning, Bass and Ball (2014) argue "there is far more mathematics visible in watching it in action than one can see from [reading or studying] the curriculum alone" (p.305). This implies that observation of teaching might be more meaningful to teachers than other forms of professional learning focusing on less visible aspects of teaching.

Collaboration around observed lessons

Naik and Ball (2014) made an important contribution to understanding how teachers participate in communities of practice around observing lessons directly. They identified characteristics of teachers' participation in co-planning, observing and analysing five consecutive mathematics laboratory classes in a university in which an experienced teacher taught the lessons to a group of underperforming year 5 students. They argued that it was important for teachers to have a role in co-planning to give them an active voice in anticipating what might happen in the lesson even if they did not have to teach it. This differentiated participation for teachers in a non-threatening way and enabled them to actively participate and reflect on their practice. Naik and Ball (2014) also asserted that the collaborative discourse following modelled lessons was a powerful way for teachers to develop new insights about how to respond to diverse representations of student thinking. This suggests that opportunities to co-plan and anticipate responses as well as collaboratively reflect on observations are important components of collaboration around lesson observations.

Naik and Ball's (2014) study was limited to a University laboratory setting and they did not deliberately focus teacher observations on pedagogy whereas this present research explored collaboration around observed lessons in a school context with a deliberate focus on teacher actions. The particular pedagogical approach used in this study was based on the research of Sullivan, Walker, Borcek, and Rennie, (2015).

Pedagogy

Sullivan et al. (2015) argued for a 'challenging tasks' approach to mathematics classroom pedagogy in which students are encouraged to find solutions to problems by thinking for themselves before instruction from the teacher. Sullivan et al. asserted their approach is "fundamental to opportunities for problem solving and reasoning" (p. 41).

Importantly, Kisa and Stein (2015) claimed instruction that supports student thinking and reasoning is different from conventional and widespread teacher led instruction, which "tell[s] students what and how to think" (p.107). They maintained that teachers "must [learn to] shift their vision of teaching from a solo endeavour to an interactional event among their

own teaching actions, students thinking and the nature of the task they selected" (p. 108). Likewise, Sullivan et al. (2015) argued that teachers were more likely to use challenging tasks if they understood the mathematics in the tasks, could anticipate student responses and were aware of ways to differentiate and implement such tasks in their classrooms. Importantly, Naik and Ball (2014) assert that "[these ideas] won't be effective unless the teachers see them in actual practice" (p. 51). This suggests providing tangible opportunities for teachers to see teaching in more interactional ways and collaboratively reflect upon it is critical for raising levels of student thinking in classrooms.

The above summary of literature suggests that collaboration around observing modelled lessons in real time classrooms may have the potential to support teachers to see teaching in new ways and learn in a non-threatening way by positioning themselves inside and outside of teaching practice. This paper addresses a gap in the literature relating to the impact of collaborative conversations in communities of practice. The research question framing the research reported in this paper is:

> What is the nature of teacher learning about pedagogy in the collaboration around teaching that is observed together?

Method

The research reported here is focused on the nature of teacher learning as they engaged collaboratively in co-planning and analysing lessons they observed together.

As part of my larger doctoral project investigating the relationship between modelled lessons and teacher learning, I worked with a group of six Foundation level (age 5), and Year one and two teachers to investigate their learning through a process which involved engaging directly with practice through observing, planning and reflecting on observed lessons in collaboration with colleagues. The intent was to enable teachers to maximise their potential to develop the confidence to implement changes to their practice.

Because teachers' often report difficulties in catering for levels of achievement and in assigning tangible meaning to practices such as mathematical reasoning and problem solving a particular pedagogical approach was emphasised in the observed lessons. This involved initiating student learning experiences with challenging tasks, which would allow problem solving and extended thinking time as a first step in facilitating student reasoning. It also included differentiating those tasks for diverse learners with enabling and extending prompts (Sullivan et al. 2015). The intention was for teachers to notice these otherwise intangible practices and develop images of what it could mean to teach them. My role in this process was of researcher, teacher, and knowledgeable other. I had not met the teachers prior to this work.

Participants had between 0 to 30 years experience of teaching. The school was selected by the Department of Education Regional Director to be part of the larger study because many students at each school were below the benchmarks identified in NAPLAN testing at grades three and five.

The intervention consisted of four stages, each involving a pre-brief, live lesson and de-brief. Each stage was two hours duration, apart from stage three which was three hours long. The stages were spaced two weeks apart to allow participating teachers time to reflect on the experience. Stages one and two involved the researcher modelling one-hour lessons with 30-minute pre and post lesson briefings with the group to discuss the intent and format of the lesson. Stage three involved an additional hour co-planning with the group followed by the researcher co-teaching with a volunteer member of the group in the volunteer's class. Pre and post lesson briefings with the group were included. Stage four involved a volunteer

member of the group enacting the pedagogies that were the focus of the modelling. Again, included in this were pre and post-lesson briefings. There was an additional one-hour meeting with participating teachers prior to commencement of the intervention to explore how effective teachers facilitate student reasoning and problem solving and to outline the PL experience.

Following this meeting, a lesson request proforma was completed by the team of participating teachers. On the proforma they nominated a specific content focus for the first lesson. The purpose in having teachers choose the content focus for the modelled lessons was to exemplify teaching everyday practice through problem solving and differentiation which was connected to their classroom contexts and their perceived needs.

There were three opportunities for teacher learning in each stage described below:

Pre-brief. The thirty-minute pre-brief took place immediately before the lesson. During this time, the lesson plan was explained. This included the goals of the lesson, rationale, and tasks, how the lesson would be differentiated and learning intentions elaborated by the researcher. Any concerns teachers had about the lesson were shared and subsequently any modifications to the lesson were made.

The lesson observation. Before each lesson, observers were given an observation proforma containing the prompt:

> Write down everything you saw the modelling teacher say and do to facilitate the students' reasoning.

During the lesson participants sat at the back of the classroom but were able to move about and observe the children as they explored the mathematics in the lessons. They were asked not to teach the children but advised that they could ask children what they were thinking.

De-brief and subsequent planning. Because an important goal of the de-brief was drawing teachers' attention to teacher actions that facilitated student reasoning, I prompted the groups to discuss these actions (e.g., "What did you notice?" provoked the groups to discuss these actions).

Data presented in this paper were collected from the four cycles of teaching described above. To understand teachers' learning in the collaborative inquiry, the conversations in the post lesson de-briefs were analysed.

Analysis of Responses

Each post lesson-meeting audiotape was listened to several times and was segmented by splitting the teacher talk into *idea units* defined by a distinct change in the topic of conversation (Van Es, 2012).

Idea units were categorised according to the topic teachers attended to. These were coded as pedagogy, mathematics content, classroom management and student engagement (see Table 1.). I did further analysis of the pedagogy units to determine the following sub-categories: (1) pedagogy not clearly connected to students; (2) pedagogy clearly connected to students, but at a broad non-content specific level; (3) pedagogy clearly connected to students at a specific content-informed level (Kisa & Stein, 2015). The first sub-category captured participant comments that only related the modelling teachers actions. In contrast, the second sub-category (pedagogy clearly connected to students) characterised participant comments that were focused on the modelling teacher actions in response to the students actions as well as what the students actions response to the teacher actions. The comments in this sub-category were not at a content specific level. However the third sub-category characterised comments that were focused on teacher actions tied to student actions at a

content specific level (Kisa & Stein, 2015). These analyses with respect to the detail about pedagogy teachers that attended to enabled me to depict possible changes in their view of teaching.

Table 1: Descriptions of the codes related to the idea units with illustrative examples of teacher comments

Categories	Definition	Illustrative examples of teacher comments or questions
Pedagogy not clearly connected to students	Teacher actions with no connection to students' ideas	"The learning intentions were very clear, the children knew exactly how to participate."
Pedagogy clearly connected to students but at a broad non-content specific level	Teacher actions in relation to students ideas, but not content specific	"Your questions clarified their [students] ideas… Tell me about your thinking" "Revoicing… they [students] were able to explain their thinking"
Pedagogy clearly connected to students, at a specific content informed level	Teacher actions that affected or got affected from something specific that student(s) did or said	"I noticed as soon as Jack (student pseudonym) shared his number line strategy, quite a few went back and used that idea". For example, "Charlotte struggled until she saw that number line and then she thought "well I can take away 5 and take away 5"
Mathematics content	Questions specifically about the mathematical content of the lesson	"Were you trying to get the children to identify that 7 tens was 70?" "Would it be okay to chant in tens"
Classroom management	Issues related to student behaviours such as time management, disruptive students	"Lost kids, off task, would we have a focus group for the children that are lost?
Student engagement	The level of student participation, the extent to which students were attentive to the lesson	"The children were encouraged to keep thinking, they persisted. I saw their faces lighting up with success" " They had the courage to have a go and share their thinking"

Next, I inspected the *stance* participants used to talk about each idea unit (Van Es, 2012). This included whether participants (1) described which features stood out to them in the observed lesson, (2) evaluated what they saw instead of trying to understand it, or (4) interpreted the issue under discussion. Table 2 provides details about the stance codes.

Table 2: Descriptions of the codes related to the idea "stance"

Codes	Definition	Example
Descriptive	Talking about the observable features of the lesson.	"It was always the children who explained their own thinking"
Evaluative	Evaluating the quality of the classroom interactions; Making judgements about what was good or bad.	"I really liked how you could extend those who got the concept and enable those who were struggling".
Interpretive	Making inferences about what is observed.	"There was a lot of thinking time. Because you told them very clearly how they need to explain their thinking, I could see that Zac was sitting here thinking about how he was going to solve the problem and Zoe as well. They were thinking 'how am I going to draw that … how am I going to explain that?' Just the way you set that up enabled it to happen".

Finally, the substance of the teacher talk was analysed to encapsulate the collaborative nature of these conversations. In this, the idea units were coded as one of three categories: substantive, surface level and closed (Van Es, 2012). Substantive conversations included those where multiple participants were engaged in collective sense making of the mathematical ideas, teacher actions and student responses, in which they supported each other's evolving thinking and used evidence from the observed lesson to support claims. Surface level conversations included discussions about the mathematics learning where elaboration and evidence to support claims was scant or lacking. Closed conversations involved no analysis of the topic raised, usually only involving one participant and the researcher.

Using the codes, I created a data display. I revisited the coding through multiple iterations until the coding was solidified. For example, on my initial inspection, I included

student thinking as a category. However, upon further analysis I merged that category with (1) pedagogy clearly connected to students but at a broad non-content specific level and (2) pedagogy clearly connected to students at a specific content informed level. Based on the analysis, a table was created for the results showing the number and percentage of idea units relating to the various codes. This enabled me to see a change in the percentage of idea units related to each code from stage 1 to stage 4 of the professional learning experience.

Results and discussion

Analysis of the data revealed changes in what teachers attended to in the observation of teaching, how they made sense of what they attended to and the collaborative nature of their conversations. Importantly, the number of substantive conversations about pedagogy connected to students at a specific content informed level increased. Furthermore, teachers adopted a more interpretive stance and less evaluative stance to what they observed in the lessons. This is an important finding as an interpretive stance sets teachers up to analyse student thinking and reasoning during the enactment of cognitively challenging tasks (Kisa & Stein, 2015). The findings are encouraging in terms of the effectiveness of the professional learning in supporting teachers to see teaching in more interactional ways (Kisa & Stein, 2015).

Changing views of teaching:

The categories emerging from the data analysis of the issues teachers attended to and the total number of idea units discussed, are presented in Table 3.

Table 3: Topics of Discussion by Category

		Category											
Stages	Total number of idea units (Topics)	Pedagogy not clearly connected to students		Pedagogy clearly connected to students but at a broad non-content specific level		Pedagogy clearly connected to students, at a specific content informed level		Student engagement		Mathematics Content		Classroom Management	
		n	%	n	%	n	%	n	%	n	%	n	%
1	26	10	38	7	27	1	4	4	15	2	8	2	8
2	15	4	29	6	40	2	14	1	7	2	14	0	0
3	9	1	11	3	33	4	45	1	11	0	0	0	0
4	6	0	0	1	17	5	83	0	0	0	0	0	0

The majority of topics raised by participants fell under pedagogy compared to other issues such as student engagement, mathematics content or classroom management. Topics raised in these latter categories fell to 0% indicating that teachers focussed much less on peripheral issues and much more on pedagogy. The high percentage of pedagogy related conversations is not surprising given that the specific focus of each observation was on teacher actions that promote student reasoning. The large number of talk segments related to these topics enabled me to conduct a deeper analysis related to the pedagogy category.

My analysis of what particular aspects of pedagogy participants raised exposed an interesting pattern (see table 3). Analyses indicated that 38% of topics mentioned were initially about pedagogy not linked to students. For example, one teacher commented, “You asked probing questions to get them [the students] thinking”. These comments focussed on what the teacher did which was not clearly connected what the students appeared to be doing in relation to the task (Kisa & Stein, 2015). However, in stage 4, none of the participants

talk related to teacher actions independent of students. In this stage the majority of pedagogy related conversations (83%) were associated with teacher actions in relation to student's actions, whilst in stage 1 only 4% were at that level. The following segment illustrates the nature of such pedagogy related conversations in stage 4:

> Teacher A: I saw Jack and Tabitha (student pseudonyms) having really good conversations about the task… but the lower [ability] group were having difficulty understanding the concept [of difference]. I'm wondering whether meaning was lost in enabling prompt? …Just wondering if you think it may have been more effective if you used the same context as the main problem?
>
> Teacher B: Yeah, do you think I needed to have it exactly worded the same?"

In this excerpt participants focused on a content specific issue, that is how the class teacher B. might respond to students that had perceived difficulties in understanding the task as observed by teacher A. This excerpt also illustrates how teacher A positioned herself as a co-planner (Naik & Ball, 2012) to suggest improvements to the enabling prompt to her colleague teacher B.

The total number of topics discussed fell from 26 to 6 over the course of four stages. This decline in topics is indicative of longer, sense making collaborative conversations as exemplified in table 4.

Collaborating to investigate pedagogies

To address how collaboration impacted teacher learning about pedagogies, I examined the substance of the teacher talk related to the topics discussed and the stance participants took in discussing the lesson observations.

Table 4: Substance of teacher conversations and stance teachers took in analysing their observations.

		Stance						Conversations					
Stages	Total number of idea units (Topics)	Descriptive		Evaluative		Interpretive		Substantive		Surface level		Closed	
		n	%	n	%	n	%	n	%	n	%	n	%
1	26	4	15	13	50	9	35	3	11	2	8	21	81
2	15	1	7	2	13	12	80	6	40	4	27	5	33
3	9	0	0	1	11	8	89	3	34	3	33	3	33
4	6	0	0	0	0	6	100	6	100	0	0	0	0

Over the course of the professional learning experience participant's conversations became more substantive progressing from (11%) in stage 1 to (100%) in stage 4 as they began initiating conversations, examining pedagogies associated with student thinking and making suggestions to their colleague teachers (as shown in the excerpt above). This concurs with Naik and Ball (2014). Conversely, there was a decline in closed conversations from 81% in stage 1 to 0% in stage 4. This is because in the initial stages participants responded one at a time in turn to a prompt from the researcher: "What did you notice the modelling teacher do and say to facilitate student reasoning?"

Importantly interpretive sense making conversations increased from 35% in stage 1 to 100% in stage 4. This change is important because an interpretive stance enables teachers to deeply examine classroom events, which leads to more accurate assessments of teaching and learning and productive responses to student thinking (Kisa & Stein, 2015).

The large percentage of evaluative comments (50%) in stage one is indicative of the majority of comments from participants, which began with "I liked…" Such evaluative comments decreased over time to 0% in stage 4.

The above data in table 4 supports the data in Table 3 showing conversations about pedagogy became deeper enabling greater participation and more sense making to occur. This suggests features such as: anticipating-observing-analysing-reflecting-planning-anticipating impacted and shaped teacher participation which in turn impacted teacher learning. This finding is consistent with Naik and Ball (2012).

Conclusion

This study sought to answer the question 'What is the nature of teacher learning about pedagogy in the collaboration around teaching that is observed together?' The results indicate that teachers not only progressed in shifting their views of teaching but also from seeing themselves as passive learners to active designers in proposing improvements to their colleagues. An important implication is that collaborative observation and reflection on teaching situated within the enactment of challenging tasks can be effective in supporting teachers to make sense of teaching in new ways. Further research needs to be conducted on the impact of the role of the knowledgeable other in this process.

References

Bass, H., & Ball, D. L. (2014). Mathematics and education: Collaboration in practice. In M. N Fried & T. Dreyfus (Eds.), *Mathematics & mathematics education: Searching for common ground* (pp. 299-312). Springer Netherlands.

Borko, H., Jacobs, J., Eiteljorg, E., & Pittman, M. E. (2008). Video as a tool for fostering productive discussions in mathematics professional development. *Teaching and Teacher Education*, *24*, 417-436.

Butler, D., Lauscher, H., Jarvis-Selinger, S., & Beckingham, B. (2004). Collaboration and self-regulation in teachers' professional development. *Teaching and Teacher Education, 20*, 435-455

Hodgson, L. (2013). What teachers see when watching others teach. In V. Steinle, L. Ball & C. Bardini (Eds.), *Mathematics Education: Yesterday, today and tomorrow: Proceedings of the 36th annual conference of the Mathematics Education Research Group of Australasia*. (pp. 386 -393). Melbourne.

Kisa, M. T., & Stein, M. K. (2015). Learning to see teaching in new ways: A foundation for maintaining cognitive demand. *American Educational Research Journal, 52* (1) 105 -136.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.

Naik, S., & Ball, D. L. (2012). *Teacher learning through organized experiences*. Paper or poster session presented at the meeting of the 12th International Congress of Mathematical Education, Seoul, Korea.

Naik, S. S., & Ball, D. L. (2014). Professional development in a laboratory setting examining evolution in teachers' questioning and participation. *Journal of Mathematics Education*, *7*(2), 40-54.

Putnam, R. T., & Borko, H. (2000). *Educational Researcher*, *29*(1), 4-15.

Sullivan, P., Walker, N., Borcek, C., & Rennie, M. (2015). Exploring a structure for mathematics lessons that foster problem solving and reasoning. In M. Marshman, V. Geiger & A. Bennison (Eds.), *Mathematics Education in the Margins: Proceedings of the 38th annual conference of the Mathematics Education Research Group of Australasia.* (pp. 41 -57). Sunshine Coast.

Timperley. (2015). *Professional conversations and improvement focussed feedback*. Retrieved from http://www.aitsl.edu.au/docs/default-source/professional-growth-resources/Research/professional-conversations-literature-review-oct-2015.pdf

Van Es, E. A. (2012). Using video to collaborate around problems of practice. *Teacher Education Quarterly*, *39*(2), 103-116.