

Story weaving : a process for critical collaborative professional development

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This paper describes on-going action research into the collaborative professional development of the authors themselves. It was based on data collected through story telling and weaving. The results suggest that this is an effective tool for self initiated professional development.

We are two people who are working within pre-service mathematics teacher education at Waikato University. Merilyn has teaching experience with children aged 5 to 7 years and has worked in teacher education for 6 years. She is teaching a mixed media distance class (56 students) for the first time this year. Bronwen has teaching experience with children aged 13 to 18 years and has just started to work with pre-service teachers. We had shared ideas and experiences with respect to mathematics education and research informally prior to this. However, when the opportunity arose to work more closely together (we have adjoining offices) we made a commitment to meet regularly to discuss our teaching and learning. These meetings were intended as planned opportunities for professional development from which we could learn about our own teaching and learning (Bell & Gilbert, 1996).

We used an action research framework to explore the process of our learning (Cohen & Manion, 1994). Data has been generated and analysed through progressive story telling. Our reading and prior experiences suggested that story telling was an effective tool for making sense of and researching the complexities of teaching and learning (Bell and Gilbert, 1996; Bruner, 1986; Connelly & Clandinin 1990; Drake, Elliott & Castle, 1993; James, 1996; Taylor, 1996).

Story telling is important for both listeners and narrators. Stories are richly textured sources of information to others ... the assumptions underpinning the practices described within these stories may easily be questioned, leading to a reflective and potentially enlightening evaluation. (James, 1996)

Why weave stories together?

Through our previous discussions, we were aware we each found teaching to be a moral and an intellectual activity (Ball & Wilson, 1996; Fullan, 1993; Ocean, 1996). As teachers we are committed to helping our students think about mathematics and mathematics education issues. We consider we have a responsibility to strive to improve our teaching and thus provide more effective learning opportunities for our students and subsequently the children they will teach. We both believe in the value of collaboration, caring and connection (Belenky et al, 1986; Noddings, 1986; Gilligan, 1982). We wanted to model and experience the processes we believed in.

... we see a dialectic relationship between the teacher's collaborative inquiring relationship with other professionals and his or her similar relationship with members of his or her classroom community of inquiry. (Wells, 1997)

Our collaboration has involved sharing, by telling, the stories of our teaching and learning. More importantly our collaboration has led to a weaving of our stories.

Through the interaction of our individual narratives, we collaborated in the telling and retelling of stories of the past and in

the co-creation of stories for the present and future. (Beattie 1995)

Creating a weaving

Our discussions of the prescribed mathematics education readings for a pre-service mathematics education course are presented here as an example of the process of story telling and weaving. This episode took place over a period of four weeks.

Merilyn gave the selected readings to Bronwen. Bronwen was uncomfortable with the focus of one of the readings on young children's mathematics learning and did not want to use it. Merilyn explained other students had found the reading to be an accessible introduction to the theory of constuctivism.

Two weeks passed. During this time each of our students interviewed a five year old at a school. The purpose of the interview was to find out a child's ideas of number and number naming and to identify some which might be developed. The students provided their child with some learning experiences. Over this time we discussed the learning in our classes and the teaching and learning happening during the students' interactions with their child.

The next part of the course required a focus on learning theory. Bronwen had thought through some strategies she might use to do this. She asked Merilyn how she introduced her students to ways of thinking about theories of mathematics learning and how she linked these to their own experiences. Merilyn explained she used the reading that Bronwen had questioned. She said she presented it to her students as their first example of academic reading in mathematics education. She gave them class time to read, identify and discuss the issues it raised for them. She described the discussions. This approach was not one Bronwen had considered. However, she said she would try it.

We consider our collaboration enabled Bronwen to gain access to a new approach for focusing students on thinking about learning and to gain a feel for how students might respond to it. It challenged Merilyn to analyse why she used this approach with this reading as it was atypical of her teaching style.

We both introduced the reading in a similar way and found it generated vigorous debate about the nature of and links between learning and teaching mathematics. For example, the students discussed the links between teaching and learning mathematics, the difference between understanding and using rules and the implications of these ideas for teachers.

Our deliberate use of the same teaching strategy with an intention to share enhanced our awareness of the sense students were making while we were in our respective classrooms. Both of us were used to reflecting on our teaching but telling and re-telling the stories of our experiences required us to be more explicit. When we articulated what happened we were sharing our experiences, our doubts and concerns about the contribution we had made to our students' learning. We were also sharing our students' responses. Our joint story was woven from the insights we brought to the story telling and the sense we made together. Our joint weaving is more textured and complex than either of our stories separately, or if they had only been placed side by side.

As a result of this experience Bronwen modified two other courses to incorporate the reading. She found it generated stimulating discussion on the possibility of older children "inventing" mathematics, the use of calculators and the nature of mathematics.

Merilyn had previously given her distance mathematics education students a hard copy of the reading. She electronically posted specific focus questions to these students. This stimulated a large number of students to debate the nature of learning and teaching mathematics.

Weaving our stories enabled us to learn from and build on each others' experiences. With our students we found we noticed we could weave in more subtle nuances from their comments. This deepened and enriched all discussions. In addition, this extended process confirmed the teaching strategy was able to be generalised. Our sharing worked with mathematical activities as well. This paper is another joint story and the writing of it has helped us become more aware of ourselves as teachers and learners.

What have we woven?

Even though we are experienced teachers we have found story weaving has made the process of professional development more innovative. Through our collaborative action research we have been able to weave an intricate, textured joint story. It has given us the impetus to reflect on, describe and explore the tentative feelings and thoughts we had about teaching and learning in new situations. It encouraged us to dabble in the unknown.

We have learned:

- the power of **critical collaborative reflection on practice** (Lytle & Cochran-Smith, 1992; Drake, Elliott and Castle, 1993)
- the value of setting aside **time** for this (Fullan, 1993; Hargreaves, 1994, Lytle and Cochran-Smith, 1992)
- the importance of **ongoing** reflection for professional development (Fullan, 1993)
- the importance of being **non-judgemental** when sharing (Cowie and Saunders, 1993)
- that together we can create **new possibilities** for action by weaving our individual prior and current experiences.

The interlacing of experience and critical reflection supported by mutual trust, caring, and sharing created more opportunities and more questions (Fullan, 1993; Thayer-Bacon, 1993; Wells, 1997). Some of these are:

- Who can produce knowledge of teaching that is seen as legitimate?
- Who is able to legitimise this knowledge and what criteria do they use?
- What does the knowledge encompass?

These questions have already been raised by researchers investigating teachers' voice and insider/outsider perspectives (Hargreaves, 1996; Elbaz, 1990; Lytle and Cochran-Smith, 1992). None of them seem to have explored the questions in relation to their own professional development and knowledge of teaching. We intend to use our collaborative weaving to explore these questions within our continuing mathematics education research. We would like others to weave with us.

References

- Ball, D. L., & Wilson, S. M. (1996). Integrity in Teaching: Recognising the Fusion of the Moral and Intellectual. *American Educational Researcher*, 33(1), 155-192.
- Beattie, M. (1995). The Making of Music: The Construction and Reconstruction of a Teacher's Personal Practical Knowledge during Inquiry. *Curriculum Inquiry*, 25(2), 133-150.
- Belenky, M. F., Clinchy, B. M., Goldberger, N. R., & Tarule, J. M. (1986). *Women's Ways of Knowing*. United States of America: Basic Books.
- Bell, B., & Gilbert, J. (1996). *Teacher Development: A model from science education*. London: The Falmer Press.
- Bruner, J. (1986). *Actual Minds, Possible Worlds*. Cambridge, Massachusetts: Harvard University Press.
- Cohen, & Manion (1994). *Research Methods in Education*. London: Routledge.
- Connelly, F. M., & Clandinin, D. J. (1990). Stories of Experience and Narrative Inquiry. *Educational Researcher*, 19(5).
- Cowie, B., & Saunders, J. (1993). Reflection. In J. Neyland (Ed.), *Mathematics Education: A Handbook for Teachers Volume 1*, Wellington: The Wellington College of Education.
- Drake, S. M., Elliot, A. E., & Castle, J. (1993). Collaborative reflection through story: towards a deeper understanding of ourselves as women researchers. *Qualitative Studies in Education*, 6(4), 291-301.
- Elbaz, F. (1990). Knowledge and Discourse: The Evolution of Research on Teacher Thinking. In C. Day, M. Pope, & P. Denicolo (Eds.), *Insight into Teachers Thinking and Practice* London: Falmer.
- Fullan, M. (1993). *Change Forces*. London: The Falmer Press.
- Gilligan, C. (1982). *In a different voice*. Cambridge: Harvard University Press.
- Hargreaves, A. (1996). Revisiting Voice. *Educational Researcher*, 25(1), 12-19.
- Hargreaves, A. (1994). *Changing Teachers, Changing Times*. London: Cassell.
- James, A. (1996). Learning to be friends: methodological lessons from participant observation among English schoolchildren. *Childhood*, 3(3), 313-332.
- Lytle, S., & Cochran-Smith, M. (1992). Teacher Research as a Way of Knowing. *Harvard Educational Review*, 62(4), 447-474.
- Noddings, N. (1986). Fidelity in teaching, teacher education, and research for teaching. *Harvard Educational Review*, 56, 496-510.
- Ocean, J. (1996). Ethics, Morality and Mathematics Education. In P. C. Clarkson (Ed.), *Technology in Mathematics Education*
- Taylor, M. (1996). Teacher's Personal Stories: A basis for classroom mathematics development? In R. Zevenbergen (Ed.), *Mathematics Education in Changing*

Times: Reactive or Proactive?. Melbourne, Australia: Mathematics Education Lecturers' Association.

Thayer-Bacon, B. (1993). Caring and its Relationship to Critical Thinking. *Educational theory*, 43(3), 323-341.

Wells, G. (1997). List-serve communication