CONFRONTING, NAVIGATING AND RESOLVING RESEARCH TENSIONS

Debbie Stott
South African Numeracy Chair Project
Rhodes University, Grahamstown, South Africa
www.ru.ac.za/sanc

RHODES UNIVERSITY
Where leaders learn

SA NUMERACY CHAIR PROJECT

Introduction

- Why share these experiences?
  - **EDUCATIONAL RESEARCH TAKES PLACE IN REAL WORLD CONTEXTS, WITH REAL PEOPLE**
  - to illuminate that the path of undertaking a research study is not straightforward and without tensions and issues.
  - Issues that arise have to be confronted, navigated and resolved
  - I believe that the process of sharing how this is done in a research context is an important aspect of academic citizenship.
  - The tensions I encountered during the course of my research tell a story of my own learning process and they highlight reflective 'praxis' as a powerful part of the process.

Context and empirical field

- Member of the SANC project:
  - Unique opportunity to participate in a number of maths clubs as both club **mentor** and as a **researcher**.
  - Also the **Maths Club co-ordinator** for the project and have been specifically tasked with the design and related facilitator training
  - My work is focussed on both development and research in the field of numeracy
- SANC project aims:
  - to improve the quality of teaching of in-service teachers at primary level and to improve learner performance in primary schools as a result of quality teaching and learning.
  - to grow an area of research which looks towards finding sustainable solutions to the many numeracy education challenges faced in our area.
- The project began in 2011 and has worked with 14 schools in the greater Grahamstown area, Eastern Cape, South Africa.
- The teacher development programme has worked with approximately 45 numeracy teachers (ranging from Grade 0 to 6) who have participated in regular workshops focused on issues and challenges in numeracy teaching.

Methodology and questions

- Interpretive research paradigm
- Longitudinal case study research
- Aimed to explore the mathematical proficiency of learners in two clubs and to examine the nature of the mediation evident in the clubs.
- Specifically the research questions were:
  1. How do learners' mathematical proficiency levels evolve (if at all) over the period of participation in the maths club?
  2. What is the nature of the mediation that enables or constrains the emergence of a ZPD in the club learners?
- Conflicting questions?

The dual nature of study

The challenge of playing multiple roles

NAVIGATING …

The changing nature of research instruments

The challenge of collecting data in authentic contexts

Issues with ethical tensions with learner assessments

Navigating the dual nature of the research study

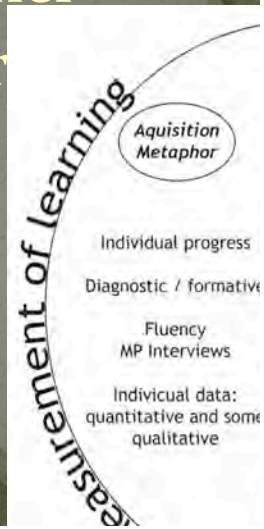
- a Vygotskian perspective to development and learning
- Learning cannot exist without development and development cannot exist without learning.
- Based on Sfard's 1998 work:
  - 'Learning as acquisition' - learning is the acquisition of something that is then stored in the individual.
  - 'Learning as participation' metaphor considers learning as a process of becoming a member of a certain community, which entails the "ability to communicate in the language of this community and act acco its particular norms" (Sfard, 1998, p. 6).

The dual nature of study

- purposely worked with both these perspectives using a complementary approach to the notions of acquisition and participation
- Often these two perspectives are seen as being in opposition to each other.
  - However, working within the broad sociocultural paradigm, the tensions between the two notions of acquisition and participation are nothing unusual. I saw the two notions as forming a yin/yang type of fit, which complemented rather than conflicted with each other.
- This complementary approach
  - a key part of my researsch
  - reflected and interwoven into all aspects of study:
    - two main research questions reflected the complementarity between the perspectives of acquisition (primary perspective foregrounded for question one) and participation (primary perspective foregrounded for question two)
    - the methodology, findings, analysis and discussion of these questions

Methodological concerns with this dual approach

- Combination of complementary perspectives and the idea that Vygotsky stressed the need to not concentrate only on the product of development but on the process of change (1978),
- Influenced how I designed the data collection and chose the data collection instrument for the study
  - Q1: measurement of possible learning for each learner
  - Q2: observation of the process of how possible lear was facilitated



When sociocultural researchers conduct research on developmental processes, they "become part of that setting and thus become mediating factors" in the learning they are hoping to research. This does not 'contaminate' the research environment; rather the researcher becomes an "additional mediational means in a learner's development".

any assessment instrument "embodies the researcher's sense of an appropriate developmental path for people to follow, and produces data that identifies people's progress … according to the direction of the path"

Smagorinsky (1995)

My interview instrument and the task-based interviews were introduced into the club environment and became mediational in nature.

Navigating the changing nature of research instruments

- The timely administration of diagnostic assessment tasks in the pilot club enabled a powerful data-driven approach to activity selection to emerge from the club.
- But:
  - Difficult to track learner progress with original instrument
  - Changed to use Wright et al.s Maths Recovery 1-1 interviews and the LFIN
  - track detailed progression over time and thereby provide data for my first research question

The changing nature of research instruments

Navigating ethical tensions with learner assessments

- timed fluency activities to encourage learner fluency in basic facts (drawing on Askew's (2012) basic facts)
  - Initially intended to be part of the mental maths warm-up activities promoted.
  - Realised they provided useful research data for monitoring learner progression.
  - A clear advantage: fast to administer and quick access to learners' fluency levels in the basic facts.
- sizable body of work that argues against timed activities in mathematics
- Explored in a 2013 paper in xxx

Issues with ethical tensions with learner assessments

Navigating the challenge of collecting and transcribing data in authentic contexts

- RQ2: video as the data collection method
- originally intended to collect video data in every club session
- Challenging: lot of data but not useful!
  - I could not be mentor and collect video data at the same time – not Superwoman!
  - Did not show faces, gestures
  - Could not hear spoken words
- Task-based interviews:
  - esigned so that the interviewees not only interact with the interviewer and with each other but also with a task that is carefully designed for the purposes of the interview (Maher & Sigley, 2013)
  - Able to record discussions, gestures and facial expression
  - Same norms as the clubs

The challenge of collecting data in authentic contexts

Navigating the issue of playing multiple roles in the research process

- possible that my multiple roles could have caused tension
- My saviour
  - The research journal!
  - after weekly club sessions,
  - after reading literature,
  - after working on data,
  - after supervisory sessions,
  - grappling with a theoretical or methodological tension,
  - sketch the many diagrams I used in my study as these diagrams helped me to make sense of many aspects of my work.
- The entries were invaluable when it came to remembering the stories, the personal learning process, decisions I made and why and how aspects of the research evolved.
- Enabled a reflexive praxis to emerge during my study

The challenge of playing multiple roles

Praxis

- 'praxis' - a way of doing things or a way of translating theoretical ideas into action.
- from a Vygotskian perspective: data generated through the research process is a social construct developed through the relationship of the researcher, research participants, the research context and the methods of data collection.
- Researchers need to reflect on how their involvement in the research process affects teaching, learning, and the evaluation of both (Smagorinsky, 1995)
- My relationship – highly complex
- Reflect on how
  - the research process affected teaching and learning in the clubs
  - the research process affected me as researcher and the context in which I operate

Club co-ordinator
(club programme design,
broad data for SANC project reporting,
sustainability)

Broad to narrow focus
Narrow to broad focus

Theory into action
&
vice versa

Mentor / facilitator
(implementation: running clubs
according to
SANC project aims)

Theory into
action
&
vice versa

Researcher
(theoretical, conceptual
and methodological
focus)

Example

- pilot club
  - Illuminated the entwined and dialectical nature of the data collection and design processes
  - identified and shaped the zone of proximal development for the purposes of our club as the critical design concept for each club session for each learner.
  - influenced the broader study leading to an increased focus in my research questions and thus the theoretical and conceptual frameworks and the methodological design.
- reflective praxis illuminates the relationships between theory and practice and how the dialogue between the two elements informs each.
- Used empirical evidence to move from an initial multifaceted design to a much simpler, more learner-centred design and these findings informed the data collection process and the club session design for the subsequent research study