

Mar 2017

CURRICULUM VITAE

JILL ADLER

1. PERSONAL DETAILS

Name: Jillian Beryl Adler, nee Smidt.

Current Position SARChI Chair of Mathematics Education, Division of Mathematics Education, University of the Witwatersrand

Visiting Professor of Mathematics Education, Kings College, London.

Date / Place of Birth: 31 January 1951, Johannesburg, South Africa.

Citizenship: South African

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2. ACADEMIC QUALIFICATIONS

PhD 1996. University of the Witwatersrand (Rand), entitled: *Secondary teachers' knowledge of the dynamics of teaching and learning mathematics in multilingual classrooms.*

M.Ed 1985. University of the Witwatersrand (Rand). Dissertation, **with distinction**, entitled *Mathematics by newspaper in South Africa: junior secondary mathematics for adults through the medium of a newspaper.*

B.Sc 1972. University of the Witwatersrand. Mathematics III and Psychology III.

3. PROFESSIONAL QUALIFICATIONS

S.T.D 1973. Secondary Teacher's Diploma. University of Cape Town (mathematics; guidance).

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#### 4. ACADEMIC DISTINCTIONS/FELLOWSHIPS/AWARDS

- 2015 ICMI Hans Freudenthal Medal named after the eighth president of the International Commission of Mathematics Instruction – ICMI - (1967-1970), in recognition of a major cumulative program of research and its impact.
- 2015 Svend Pedersen Lecture Award 2015, Department of Mathematics and Science Education, University of Stockholm, for research that has made a significant and lasting contribution to the Department’s research and teacher education.
- 2015 – 2019 Continuation award of SARCHI Chair of Mathematics Education
- 2015 Award from Oppenheimer Memorial Trust for Research
- 2012 Academy of Sciences of South Africa (ASSAf) Gold Medal for Science in the service of society.
- 2009 NSTF award for innovation in mathematics and science education, Marang Centre
- 2007 Academy of Science of South Africa – Nominated and accepted member 2007.
- 2003 University of the Witwatersrand, Vice Chancellor’s Research Award for 2003.
- 2003 University of the Witwatersrand, Vice Chancellor’s Academic Citizenship Team Award for 2003 – Awarded to the Mathematics Education Unit that in 2003 was under my leadership.
- 2010-2014 Sasol Fellowships Mr Vasen Pillay (PhD); Ms Ntsiki Loxomo (Masters continuing into PhD).
- 2010-2012 Mellon Award for mentoring programme with Ms Patricia Nalube, doctoral fellow
- 2009-2014 FRF Chair of Mathematics Education (SARCHI Chair)
- 2001-2002 Growing Our Own Timber Award for mentoring with (now late) Godfrey Sethole, who graduated with PhD in November 2005.
- 2000-2003 British Council Higher Education Links award for joint activity across Southbank University in London and the University of the Witwatersrand.
- 1998-2000 Mellon Award for mentoring programme with Ms (now Professor) Mamokgethi Setati-Phakeng
- 1987 British Council Associate Fellowship Award, Institute of Education, London University.
- 1985 M ED dissertation achieved with distinction
- 1969/1970 American Field Scholarship

#### 5. MEMBERSHIP OF PROFESSIONAL BODIES, ASSOCIATIONS, EDITORIAL BOARDS, DIRECTOR BOARDS, REVIEW/ ADVISORY COMMITTEES

##### 5.1. Executive Positions:

##### 5.1.1. INTERNATIONAL:

##### **President ICMI (International Commission on Mathematical Instruction) 2017-2020**

Elected by ICMI General Assembly in Hamburg, Germany, July 24, 2016

##### **Vice President of ICMI 2003-2009**

Nominated by AMESA (National Mathematics Teachers’ Association) for the ICMI executive in 2002; supported by ICSU – South Africa and duly elected at the IMU conference and AGM in August 2002 as one of two Vice Presidents 2003 – 2006. Re-elected to this position for a second term: 2007 – 2009.

**Member of the International Programme Committee for ICME-10 Copenhagen 2004**  
(International Congress of Mathematical Education.)

**Member of the International Committee (IC) of PME 1994 - 1998**

- Elected on to the IC for PME at the Annual Conference in Lisbon Portugal, July 1994 for 4 years. The 16-member committee is responsible for the development and direction of the Group and the annual conference.
- One of three IC members elected to the **Programme Committee for the 1996** PME conference in Valencia, Spain.
- **Programme Chair** for the 22nd International Conference of the Psychology of Mathematics Education Group (PME22) due to be held in Stellenbosch in July 1998.

**5.1.2. NATIONAL**

**ASSAf – Academy of Science of South Africa - Chair of Commission on STEM Education Jan 2009 – Feb 2011**

**Executive Committee SAARMSTE 1993.**

(Southern African Association for Research in Mathematics, Science and Technology Education)

- SAARMSTE executive committee 1993-4. Portfolio: fundraising.
- Conference programme committee - 1994.
- Conference programme committee – 1996.

**5.2. Professional bodies and associations**

- International Group for the Psychology of Mathematics Education (PME)
- American Educational Research Association (AERA).
- British Society for Research in Learning Mathematics (BSRLM).
- Mathematics Education Research Group of Australasia (MERGA)
- Southern African Association for Research in Mathematics and Science Education. (SAARMSE)
- Association of Mathematics Educators in South Africa (AMESA)
- The Kenton Education Association (South Africa)

**5.3. Boards of Directors**

Member of Board of Directors for the **Gauteng Institute of Education Development (GIED)**, 1998 - 2003, a curriculum development initiative funded jointly by the Gauteng Department of Education and the British Government aid agency DFID.

**5.4. Editorial Boards**

July 2010 –

- **Journal for Research in Mathematics Education.** Journal of the National Association of Teachers of Mathematics, USA, ISI journal.

June 2007 –

- **Research in Mathematics Education.** Journal of the British Society for Research in Mathematics Education
- **Mathematics Education Research Journal** (International Journal published in Australia).

Jan 2004 – ...:

- **Pythagoras**. Journal of the Association for Mathematics Educators in South Africa (AMESA). Newly recognised South African Journal  
Jan 2000 - 2012:
- **Educational Studies in Mathematics** (International accredited Journal, Springer, leading international journal in Mathematics Education.)  
January 1998 - 2012:
- **For the Learning of Mathematics** (International accredited journal published in Canada)

### 5.5. Review Committees and review tasks

One of three international reviewers of the **Homi Bhabha Centre for Science Education, in Mumbai – India, October 2014**. The International Review Committee was tasked with assessing the progress of the Centre over its twenty years work, and recommending directions for the future.

### 5.6. National Research Foundation (NRF)

- Evaluation and Rating Committee: Education 2007
- Appeals committee for rated researchers – 2003 - 2005  
(This is a senior committee in the NRF and the rating process)
- Advisory Committee of the Institutional Research Development Programme (IRDP): Panel member for the University of the North, assessment of proposals within the Research Niche Area (RNA) on “Mathematics, science and technology education”. 2004.
- Evaluation Committee for Ratings for Science Educators. 1999 - 2001
- Evaluation Committee for review of funding proposals in Education for the Knowledge Era: Teacher Education, Science Education, Higher Education. 2000 ...
- Review Committee for Research Development at Historically Black Universities (Western Cape). 2001
- Reviewer for Science Education (ratings; project proposals; other funding applications). 1998 ongoing
- Reviewer for Education (project proposals; other funding applications). 1998 ongoing
- Advisor/participant in NRF “think tanks” e.g. Systemic change programme; review criteria for Science Educators. 1999-2001

## 6. ACADEMIC AND PROFESSIONAL POSTS HELD

October 2009 – current	<b>SARCHI (previously FRF) Chair of Mathematics Education</b> , Wits School of Education.
Jan 2008 – Dec 2008	<b>Director:</b> Marang Centre for Mathematics and Science Education, Wits School of Education.
Aug 2014 – current	<b>Visiting Professor of Mathematics Education</b> , King’s College London
Jan 2007 – July 2014	<b>Professor of Mathematics Education</b> , Kings College London (jointly held with position of Professor of Mathematics Education at Wits);
May 2005-Dec 2006...	<b>Head:</b> Division of Mathematics and Science Education, School of Education, Wits
Jan-Apr 2005	<b>Acting Director:</b> Centre for Mathematics and Science Education, School of Education, Wits
Apr 2002-...	<b>Professor of Mathematics Education in</b> School of Education (the Sentrachim Chair funding ended, the position continued but shifted to the School of Education in the Faculty of Humanities, Wits).
Jan 2000-2002	<b>Chairperson: School of Science Education</b> , Faculty of Science, University of the Witwatersrand (Wits).

- Jul 1997-2002      **Wits University/Sentrachem Foundation Chair of Mathematics Education Development**, School of Mathematics, Faculty of Science, Wits.
- Jan-Jun 1997      **Acting Head of Department of Education**, Wits
- Sep 1995-Jun 1997      **Deputy Director Further Diplomas in Education**  
Faculty of Education, Chair of Curriculum Committee, Wits.
- Apr 1994      Promoted to **Senior Lecturer, Department of Education, Wits**
- Jan 1989 - Mar 1994      **Lecturer, Education Department, Wits**
- Jan 1986 - Dec 1988      **Senior Lecturer, Department of Professional Studies (Maths) Johannesburg College of Education.**
- Jan 1977 - Dec 1985      **SACHED TRUST, Johannesburg**  
Jan 1977 - Oct 1978      **Distance Education Course Writer and Editor;** Consultant to Bophuthatswana Teacher Upgrading Project; Teacher GCE O-Level (international)
- Oct 1978 - Oct 1979      **Head of Department; Research and Development of Distance Learning Courses.**  
(November 1979 - January 1980 Accouchement leave)
- Jan 1980 - Dec 1985      **Distance Education Course editor, project evaluator.**
- Aug-Dec 1976:      **Secondary Mathematics Teacher**, King David High School, Victory Park, Johannesburg.
- Jan 1974 - Dec 1975      **Secondary Mathematics Teacher**, Harold Cressy High School, Cape Town.

**7. RESEARCH: RATING - NRF - National Research Foundation Rating 2011: A2**

There is a researcher rating system in South Africa, conducted by the National Research Foundation – funding for research from the NRF is linked to ratings. The description of A ratings in this process are provided below and taken from the NRF website. Further details of the research rating system in use in South Africa, together with descriptions of each level of rating, can be found on [www.nrf.ac.za](http://www.nrf.ac.za). All academics are re-rating on a 5 yearly basis. I was rerated in Nov 2011, and retained my A2 rating (first obtained in Nov 2006).

<b>A</b>	Researchers who are unequivocally recognised by their peers as leading international scholars in their field for the high quality and impact of their recent research outputs.	<b>A1</b>	A researcher in this group is recognized by all reviewers as a leading scholar in his or her field internationally for the high quality and wide impact (i.e. beyond a narrow field of specialisation) of his/her recent research outputs.
		<b>A2</b>	A researcher in this group is recognized by the over-riding majority of reviewers as a leading scholar in his or her field internationally for the high quality and impact (either wide or confined) of his or her recent research outputs

## **8. RESEARCH GRANTS, PROJECTS AND FUNDING**

**8.1. Oppenheimer Memorial Trust research award, Jul 2015 – Jun 2016, R650 000**

**8.2. SARCHI five year Chair – continuation – 2015 – 2019 (R3 450 000 p.a.)**

**8.3. FRF - SARCHI five year Chair 2010 – 2014 (R2 500 000 p.a.); supplementary funding for components of this project (R1 500 000 p.a.) from NRF, Sasol foundation, RMB and APEXhi**

**8.4. 2009-2012 Seed corn funding KCL for research on MEC programmes (GBP 2000)**

**8.5. NRF Five year grant 2007 – 2011 (R350 000 per year)**

**8.6. MARANG Centre for Mathematics and Science Education**

During 2003, together with some colleagues I led the development of a new Centre for Mathematics and Science Education, which was passed by Senate at the end of 2003. In 2004 I played a central role raising R3.5 million from one of the major banks in South Africa, supplementing R1.2 million from the University itself to fund the Centre and a Chair in Science Education for 2005 - 2007. As acting director of the Centre in the first months of 2005, I was instrumental in building a vision and strategic plan for research and development in the Centre. Restructuring in the School of Education in 2005 placed the Centre within a wider Division of Mathematics and Science Education of which I became the head, and Professor Setati was appointed Centre Director. On her move to Unisa at the end of 2007, I returned to the position of Director. The Centre won the prestigious NSTF award for contribution to science education in 2009.

**8.7. National Research Foundation (NRF) research project team leader 1996- ----**

Since 1996 I have secured funding as principal grant holder for ongoing research in teacher education, and specifically mathematical knowledge for teaching, from the National Research Foundation. Each of the studies involved/involves a research team. A list of projects follows.

The FDE project below involved a team of ten researchers, all working on the program as academic teaching staff. This program involved research across Mathematics, Science and English Language. Current research on mathematics for teaching involves collaboration with colleagues across institutions in South Africa.

**1996: A Base-line Study of the FDE programme in Mathematics, Science and English Language Teaching.**

**1997 – 1999: Mixed Mode FDEs And Their Effects**

Three year team-based follow-up study from the base line done in 1996 to investigate changes in FDE teachers practices in mathematics, science and English language teaching.

**2000: Continuation grant with focus on textbook usage in Grade 7 and 9 Mathematics classrooms.**

**2001: Appropriate mathematics for teaching – focus on concept-mapping as a research tool.**

**2002: Mathematics teachers' conceptual knowledge** – a survey of how this is conceptualised and operationalised in current formalised Level 6 and 7 mathematics and mathematics education courses across institutions in South Africa. This was a national collaboration involving co-investigators from UPE, UCT, UND and Univen, and formed the **research arm of QUANTUM** (see above)

**2003 - 2006: QUANTUM research project. Mathematical knowledge for teaching:** in depth case studies of mathematics in use in teacher education across three sites of practice (2003-5); followed by studies of mathematics in use in school classrooms across sites of practice (2005-2006).

**2007 – 2011: Mathematics for teaching. Continuation and development of QUANTUM** (5-year research funding from the NRF, with co-investigators across institutions in South Africa, and Dr Kazima in Malawi.)

**2009 – 2012 The UK arm of QUANTUM** was initiated and developed through the support of King's College. QUANTUM extended its focus across contexts beyond Africa

**8.8. British Council Higher Education Links Project leader Apr 2000 – Mar 2003**

7 200 GBP p.a. for a link programme with Southbank University and Professor Stephen Lerman for research, staff and programme development in Mathematics Education.

**8.9. British Council Higher Education Links Project Apr 2003 – Mar 2006**

5500 GBP p.a. for collaboration across Southbank, Wits and Domasi College in Malawi. This link is managed by Dr Mwakapends, together with myself and Prof Lerman

**8.10. Learner Perspective Study 2004-5**

International study, 10 countries led by Prof David Clarke of Australia. Prof Renuka Vithal, University of KwaZulu Natal (UKZN), was the PI and grant-holder for the SA study on Learner Perspectives on mathematics in Grade 8. The late Dr Sethole, was a doctoral student on the programme, under my supervision, and graduated in 2005.

**8.11. Completion of Doctoral Study 1996**

PhD completed in 1996, titled 'Secondary teachers' knowledge of the dynamics of teaching and learning mathematics in multilingual classrooms'

**8.12. CSD ad hoc grant 1993-4**

Towards effective mathematics teaching in the middle years

**8.13. M Ed degree by dissertation 1982 - 1984**

Completed in 1984. Original research in the then new fields of both distance education and illuminative evaluation. The dissertation reported on adults learning mathematics through courses printed in a national newspaper. This degree was awarded a distinction.

## 9. KEYNOTE/PLENARY INVITED ADDRESSES

Since 1993 I have delivered 49 keynote and/or plenary addresses at conferences across the world. A selection is presented here.

- 9.1. **One framework, multiple practices: The case for a common discursive resource.** Invited lecture as Freudenthal awardee. International Congree of Mathematics Education. Hamburg, July 2016.
- 9.2. **Mathematics education research in South Africa – a review and critical reflection** Keynote address, Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE), Pretoria, Jan 2016.
- 9.3. **Researching and doing professional development using a shared discursive resource.** Keynote address, Mathematics Education Research Group of Australasia (MERGA) Conference, Sunshine Coast, June 2015.
- 9.4. **From mathematics and language, to mathematical knowledge for teaching and back again: A (South African) research journey.** Svend Pederson Award lecture, University of Stockholm, May 2015.
- 9.5. **Bridging contexts, connecting research and practice: Reflections on mathematics teacher education and professional development.** Plenary presentation, Eighth British Congress of Mathematics Education (BCME8), Nottingham, April 2014
- 9.6. **Access, equity and knowledge-in-use: Reflections from a research-based teacher professional development project in post-Apartheid South Africa.** Moore Distinguished Lecture, North Carolina State University, September 2012.
- 9.7. **The interdependence of power and mathematics in opportunities to learn: A response to Marta Civil,** Plenary respondent: PME12, Korea, July 2012
- 9.8. **Access, equity and knowledge-in-use: Reflections from a research-based teacher professional development project in post-Apartheid South Africa.** Plenary address. Colloquium: Forms of Education and Emancipation, Rennes, France, May 2012
- 9.9. **Collaboration and emergence: Reflections on mathematics education in Africa.** Invited panel presentation. Plenary Panel. La didactique des mathématiques: approches et enjeux. Hommage à Michele Artigue, 31 May-2 Jun, 2012
- 9.10. **Professional Knowledge Matters in Mathematics Teaching.** Invited plenary, Section 19, The International Congress of Mathematicians, Hyderabad, India, August 2010.
- 9.11. **Mathematics for teaching matters.** Keynote, Australian Mathematics Teachers' Association, Perth, July 2009.
- 9.12. **Mathematics for teaching in the secondary school:** Plenary, AMESA, Bloemfontein, July 2009.
- 9.13. **Mathematical knowledge for teaching and concerns for equity.** Plenary panel. MSRI (Mathematical Sciences Research Institute) Conference on Mathematical knowledge for teaching K-8, Asilomar, California. May 2005



- 9.14. **The state of research in mathematics teacher education and how it needs to develop.** Plenary Presentation with Barbara Jaworksi, ICMI Study 15 on Mathematics Teacher Education, Brazil, May 2005
- 9.15. **Researching mathematics teacher education: The QUANTUM project and its progress.** Plenary presentation, 13<sup>th</sup> SAARMSTE (Southern African Association for Research in Mathematics, Science and Technology Education). Windhoek, Namibia. January 2005.
- 9.16. **Research on Mathematics Teacher Education: Mirror Images of an Emerging Field.** Plenary Presentation by ICME-10 Survey Team 3 - Professional Development of Mathematics. Copenhagen. July 2004. Chair of Survey team: Jill Adler, South Africa. Other members: Deborah Loewenberg Ball, U.S.A.; Konrad Krainer, Austria; Fou-Lai Lin, Taiwan; Jarmila Novotna, Czech Republic
- 9.17. **Researching inside teacher education: The QUANTUM project, its context, some results and implications.** Presidential panel on research into learning and practice in teacher education. Paper presented to the AERA conference in San Diego, April 2004.
- 9.18. **Mathematics and teaching in Mathematics Teacher Education: A situated and South African perspective.** Plenary address. Third Conference on the Teaching of Mathematics and Science. University of Lisbon, Department of Education and Research Centre of the Faculty of Sciences. Portugal. Jan 2004
- 9.19. **Social practice theory: some issues in mathematics teacher education.** Plenary speaker at a conference entitled: Social constructivism, socioculturalism and social practice theory: relevance and rationalisations in mathematics education. Lillehammer, Norway. March 2000
- 9.20. **Widening the lens, changing the focus: Researching language practices in mathematics classrooms.** Invited by the International Congress of Mathematics Education (ICME-9) Programme Committee to deliver a Regular Lecture (sub-plenary) in Tokyo, Japan, August 2000.
- 9.21. **What counts? Resourcing mathematical practice in South African schools.** Keynote speaker at the Canadian Mathematics Education Research Group. Ontario. Canada. June 1999.
- 9.22. **Key teaching dilemmas in multilingual secondary mathematics classrooms in South Africa.** Keynote address to conference entitled Mathematics and Culture, Royal Danish School of Educational Studies, Copenhagen, Denmark. March 1999
- 9.23. **(Re)distribution of resources = equity?** Plenary address. 1<sup>st</sup> International Conference on Mathematics Education and Society (MEAS1). Nottingham University. United Kingdom. September 1998.
- 9.24. **Resources as a verb: recontextualising resources in mathematics education.** Plenary address. 22<sup>nd</sup> International Congress of the Psychology of Mathematics Education (PME22). Stellenbosch. South Africa, July 1998.

## 10. RESEARCH OUTPUT

### 10.1. Papers in peer-reviewed journals.

- 10.1.1. Adler, J., Alshwaikh, J., Gcasamba, L. & Essack, R. (2016) Mathematics education research in South Africa 2007-2015: Review and reflection. *African Journal of Research in Mathematics, Science and Technology Education*, 10.1080/18117295.2016.1265858. <http://dx.doi.org/10.1080/18117295.2016.1265858>
- 10.1.2. Ronda, E. & Adler, J. (2016) Mining mathematics in textbook lessons. *International Journal of Science and Mathematics Education*. DOI: 10.1007/s10763-016-9738-6.
- 10.1.3. Lerman, S. & Adler, J. (2016) Policy and standards debate: Mapping changes in assessment. *Research in Mathematics Education*, 18, 2, 182-199.
- 10.1.4. Le Roux, K. & Adler, J. (2016) A critical discourse analysis of practical problems in a foundation mathematics course at a South African university. *Educational Studies in Mathematics*. 91, 2, 227-264. DOI 10.1007/s10649-015-9656-5
- 10.1.5. Pournara, C., Hodgen, J., Adler, J., & Pillay, V. (2015). Can improving teachers' knowledge of mathematics lead to gains in learners' attainment in mathematics? *South African Journal of Education*, 35(3), 10. doi: 10.15700/saje.v35n3a1083
- 10.1.6. Adler, J., & Ronda, E. (2015). A framework for describing Mathematics Discourse in Instruction and interpreting differences in teaching. *African Journal of Research in Mathematics, Science and Technology Education*. 19, 3, 237-254. doi:DOI:10.1080/10288457.2015.1089677)
- 10.1.7. Pillay, V. & Adler, J. (2015) Evaluation as key to describing the enacted object of learning. *International Journal for Lesson and Learning Studies*. 4, 3, 1-22
- 10.1.8. Parker, D. & Adler, J. (2014) Sociological tools in the study of knowledge and practice in mathematics teacher education. *Educational Studies in Mathematics*. 87, 2, 203-219.
- 10.1.9. Adler, J., Hossain, S., Stevenson, M., Clarke, J., Archer, R. and Grantham, B. (2014) Mathematics for teaching and deep subject knowledge: Voices of Mathematics Enhancement Course students in England. *Journal of Mathematics Teacher Education*. 17, 2, 129-148.
- 10.1.10. Hossain, S., Mendick, H., & Adler, J. (2013). Troubling 'understanding mathematics-in-depth': its role in the identity work of student-teachers in England. *Educational Studies in Mathematics*, 84, 35-48. doi: DOI 10.1007/s10649-013-9474-6
- 10.1.11. Adler, J. & Patahuddin, S (2012) Recontextualising items that measure mathematical knowledge for teaching into scenario based interviews: an investigation. *Journal of Education*. 56, 1 – 12.
- 10.1.12. Venkat, H., & Adler, J. (2012). Coherence and connections in teachers' mathematical discourses in instruction. *Pythagoras*, 33(3), Art. #188, 8 pages. <http://dx.doi.org/10.4102/pythagoras.v33i3.188>

- 10.1.13. Huillet, D., Adler, J. and Berger, M. (2011) Teachers as researchers: Placing mathematics at the core. *Education as Change*. 15,1, 17-32.
- 10.1.14. Miranda, H & Adler, J. (2010) Re-sourcing mathematics teaching through professional development. *Pythagoras*, 72, 14 – 26.
- 10.1.15. Adler, J (2010) Mathematics for teaching matters. *Education as Change*. 14(2), 123-135.
- 10.1.16. Venkat, H., Adler, J., Setati, M., Rollnick, M. and Vhurumuku, E. (2009) Mathematics and science education research, policy and practice in South Africa: What are the relationships? *The African Journal for Research in Mathematics Science and Technology Education. Special Issue*. November. Pp. 2-27.
- 10.1.17. Adler, J., Pournara, C., Taylor, D., Thorne, B. and Moletsane, G. (2009) Mathematics and science teacher education in South Africa : a review of research, policy and practice in times of change. *The African Journal for Research in Mathematics Science and Technology Education. Special Issue*. November. Pp. 28-46.
- 10.1.18. Rollnick, M., Adler, J. and Setati, M. (2009) The institutional location of research in mathematics and science education in South Africa. *The African Journal for Research in Mathematics Science and Technology Education. Special Issue*. November. Pp. 115-130.
- 10.1.19. Adler, J. (2009) Mathematics teacher education in South Africa: A research agenda focused on the mathematical work of teaching across diverse contexts. *The Indian Educational Researcher*. 3, 1, 5 – 20 (ISSN0974-2123) published by Stella Matutina College of Education, Ashok Nagar, Chennai 600083, India.
- 10.1.20. Adler, J. (2009) A methodology for studying mathematics for teaching. *Reserches en Didactique des Mathématique*. 29, 1, 33 – 57
- 10.1.21. Venkatakrisnan, H. and Adler, J. (2008) Expanding the foci of activity theory: Accessing the broader contexts and experiences of mathematics education reform. *Educational Review*. 60, 2, 127 – 140.
- 10.1.22. Kazima, M., Pillay, V and Adler, J. (2008) Mathematics for Teaching: Observations from two case studies. *South African Journal of Education*. 28, 283-299
- 10.1.23. Davis, Z., Adler, J., and Parker, D. (2007) Identification with images of the teacher and teaching in formalized in-service mathematics teacher education and the constitution of mathematics for teaching. *Journal of Education*, 42, 33 - 60.
- 10.1.24. Adler, J and Pillay, V. (2007). An Investigation into Mathematics for Teaching: Insights from a case. *African Journal of Research in Mathematics, Science and Technology Education*. 11, 2, 87-108
- 10.1.25. Adler, J. and Davis, Z. (2006). Opening another black box: Researching mathematics for teaching in mathematics teacher education. *Journal for Research in Mathematics Education*. 37, 4, 270 – 296.
- 10.1.26. Kazima, M. and Adler, J. (2006) Mathematical knowledge for teaching: adding to the description through a study of probability in practice. *Pythagoras*. 63, 36 – 48.

- 10.1.27. Adler, J. (2005) Mathematics for teaching: What is it and why is it important that we talk about it? *Pythagoras*. 62. 2 – 11.
- 10.1.28. Adler, J., Ball, D., Krainer, K., Lin, F.L. & Novotna, J. (2005) Reflections on an emerging field: Researching mathematics teacher education. *Educational Studies in Mathematics*. 61, 3, 359 – 381.
- 10.1.29. Parker, D. and Adler, J. (2005) Constraint or catalyst: The regulation of teacher education in South Africa. *Journal of Education*. 36. 59-78.
- 10.1.30. Adler, J. and Setati, M. (2005) Mathematics as filter of equity – an ‘old’ story and new telling. Response to Kahn, A Class Act. *Perspectives in Education*. 23. 3. 149 – 152.
- 10.1.31. Mwakapenda, W. and Adler, J. (2003) Using concept mapping to explore student understanding and experiences of school mathematics. *African Journal of Research in Mathematics, Science and Technology Education*. 7, 51-62.
- 10.1.32. Setati, M., Adler, J, Reed, Y. and Bapoo, A. (2002) Incomplete journeys: code-switching and other language practices in multilingual classrooms in South Africa. *Language and Education*. 16. 128-149
- 10.1.33. Adler, J. (2002) Lessons from and in curriculum reform across contexts? *The Mathematics Educator*. 12. 2. 1-5. (Guest editorial)
- 10.1.34. Setati, M., and Adler, J. (2001) Between languages and discourses: Code-switching practices in primary mathematics classrooms in South Africa. *Educational Studies in Mathematics*. 43. 243-269.
- 10.1.35. Dickson, M. and Adler, J. (2001) Textbook use in grades 7 and 9 mathematics classrooms. *Pythagoras*. 54.
- 10.1.36. Adler, J., Graven, M. and Pournara, C (2000). Integration within and across mathematics. *Pythagoras*. 53. 2-13.
- 10.1.37. Adler, J. (2000) Social practice theory and mathematics teacher education: a conversation between theory and practice. *Nordic Mathematics Education Journal (NOMAD)* 8. 3. 31-53.
- 10.1.38. Adler, J. and Reed, Y. (2000) Researching teachers’ take-up from a formal in-service professional development programme. *Journal of Education*, 25. 192-226.
- 10.1.39. Adler, J. (2000) Conceptualising resources as a theme for mathematics teacher education. *Journal of Mathematics Teacher Education*. 3. 3. 205-224.
- 10.1.40. Adler, J. (1999) Seeing and seeing through talk: The teaching dilemma of transparency in multilingual mathematics classrooms. *Journal for Research in Mathematics Education*. 30. 1. 47-64.
- 10.1.41. Adler, J. (1998) A language of teaching dilemmas: unlocking the complex multilingual secondary mathematics classroom. *For the Learning of Mathematics*, 18. 1. 24-33.

- 10.1.42. Adler, J. (1997) A participatory-inquiry approach and the mediation of mathematical knowledge in a multilingual classroom. *Educational Studies in Mathematics*, 33. 235-258.
- 10.1.43. Adler, J. (1997) Professionalism in Process: Mathematics teacher as researcher from a South African perspective. *Educational Action Research*, 5. 1. 87-103..
- 10.1.44. Adler, J. (1995) Dilemmas and A Paradox: Secondary Mathematics Teachers' Knowledge of their teaching in multilingual classrooms. *Teaching and Teacher Education*, 11. 3. 263-274.
- 10.1.45. Adler, J. (1995) Insights from mathematics education developments in South Africa in transition. *Mathematics Education Research Journal*, 6. 3. 101-112.
- 10.1.46. Adler, J. (1993) Moving beyond apartheid or more of the same? Political dimensions of national examining at the standard 7 level with Siza Shongwe. *Pythagoras*, 32. 29-34.
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## **10.2. Books**

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- 10.3.2. Adler, J. & Pillay, V. (2016) Setting the scene: School M, Mr T, the lesson and the data. In Adler, J. & Sfard, A. (Eds.) *Research for educational change: Transforming researchers' insights into improvement in mathematics teaching and learning*. (pp. 25-37) Routledge: London.
- 10.3.3. Adler, J. & Ronda, E. (2016) Mathematical discourse in instruction matters. In Adler, J. & Sfard, A. (Eds.) *Research for educational change: Transforming researchers' insights into improvement in mathematics teaching and learning*. (pp. 64-81) Routledge: London.
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- 10.3.7. Ronda, E., & Adler, J. (2014). Mathematical examples, tasks, and talk: A discursive lens for studying and crafting lessons. In S. Ulep, A. Punzalan, M. Ferido, & R. Reyes (Eds.), *Lesson study: Learning more together, growing in practice together* (pp. 249-280). Philippines: UP NISMED.
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- 10.3.16. Adler, J. and Huillet, D. (2008) The social production of mathematics for teaching. In Sullivan, P., & Wood, T. (Eds.) (2008). *International handbook of mathematics teacher education: Vol. 1. Knowledge and beliefs in mathematics teaching and teaching development*. Rotterdam, The Netherlands: Sense Publishers. (pp. 195-222).
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- 10.3.27. Adler, J., Slonimsky, L and Reed, Y. (2002) Subject-focussed inset and teachers' conceptual knowledge-in-practice. In Adler, J. & Reed, Y (Eds.) *Challenges of teacher development: An investigation of take-up in South Africa*. Van Schaik: Pretoria. Chapter 8, pp. 135-152.
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- 10.3.29. Adler, J. (1998) Lights and limits: Recontextualising Lave and Wenger to theorise knowledge of teaching and of learning school mathematics. In Watson, A. (Ed.) *Situated cognition and the learning of mathematics*. Centre for Mathematics Education Research. University of Oxford, Department of Educational Studies. Oxford. pp. 161-177.
- 10.3.30. Crawford, K and Adler, J. (1996) Teachers as researchers in mathematics education. In Keitel, C and Bishop A (Eds) *International Handbook of Research in Mathematics Education*. Kluwer. Dordrecht. Pp.1187-1206.



- 10.3.31. Adler, J. (1991) Vision and constraint: politics and national mathematics curricula in a changing South Africa' in Pimm, D and Love, E (Eds) *Teaching and Learning School Mathematics*. Hodder and Stoughton with Open University Press. pp 153-170.

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- 10.4.1. For the Learning of Mathematics, Special Issue: Knowing and Using Mathematics for Teaching. 29 (3), November, 2009. Co-editors J Adler and D Ball.
- 10.4.2. African Journal for Research in Mathematics, Science and Technology Education, Dec, 2009. Co-editors M Setati, J Adler and M Rollnick.

#### 10.5. Book Reviews

- 10.5.1. Adler, J (2010) Book Review. Multilingualism in mathematics classrooms: global perspectives. Richard Barwell, Ed. *Multilingual Matters*, Ottawa Published in *Research in Mathematics Education*.
- 10.5.2. Adler, J. (1996) *Alive and Well... : A Review Of Reviews Of Mathematics Education Research*.  
  
In Australasia. Review of: Bill Atweh, Kay Owen, and Peter Sullivan (Eds.) *Research in Mathematics Education in Australasia: 1992 - 1995*. MERGA. 388 pp. In *Mathematics Education Research Journal*, 10, 1, 75-79.

- 10.5.3. Multilingualism in mathematics classrooms: Richard Barwell. RME 2010

#### 10.6. Publications in refereed conference proceedings

**(NOTE: I do not, as a rule, include my name as co-author on conference papers of my research students, despite supervisory support provided for these. Hence there are numerous research project papers with my supervisory input, authored by my students, that do not appear here).**

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- 10.6.2. Adler, J. & Ronda, E. (2014) An analytic framework for describing teachers' mathematics discourse in instruction. In Nichol, C., Liljedahl, P., Oesterle, S. & Allan, D. (Eds.), *Proceedings of the joint meeting of PME 38 and PME-NA 36 (Vol 2)* (pp.9-16). Vancouver, Canada: PME.
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- 10.6.4. Adler, J. & Pattahudin, S. (2012) ICME – Using scenarios validated as measures to

explore SMK in an interview setting. The 12th International Congress on Mathematical Education (ICME-12), July 2012. Seoul, South Korea.

- 10.6.5. Le Roux, K. & Adler, J. (2012). Talking and looking structurally and operationally as ways of acting in a socio-political mathematical practice. In Tso, Tai-yih (Ed.), Proceedings of the 36th Conference of the International Group for the Psychology of Mathematics Education, 3 (pp. 51-58). Taipei: PME.
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- 10.6.7. Adler, J. (2010) Professional Knowledge Matters in Mathematics Teaching. Proceedings of the International Congress of Mathematicians, Hyderabad, India.
- 10.6.8. Adler, J. Hossain, S., Stevenson, M., Clarker, J., Archer, R., and Grantham, B. (2009) Interpretations of, and orientations to, “understanding mathematics in depth”: students in MEC programmes across institutions. Proceedings of the British Society for Research in Learning Mathematics (BSRLM), November.
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- 10.6.10. Parker, D. & Adler, J. (2009) Researching mathematics teacher education with sociological tools. In Tsekaki, M. et al (Eds.) Proceedings of the 33<sup>rd</sup> Conference of the International Group for the Psychology of Mathematics Education (PME). Thessalonika, Greece. July 2009. Volume 1. *Being developed for publication in international journal (Research in Mathematics Education).*
- 10.6.11. Adler, J. and Davis, Z. (2006) Imaginary-symbolic relations, pedagogic resources, and the constitution of mathematics for teaching in in-service mathematics teacher education. In Novotná, J., MoraováH., Krátká, M and Stehliková, N. (Eds.) *Proceedings of the 30<sup>th</sup> Conference of the International Group of the Psychology of Mathematics Education.* (Pp.2-9 – 2-16). Prague: Faculty of Education, Charles University.
- 10.6.12. Kazima, M. and Adler, J. (2006) Mathematical knowledge for teaching: Adding to the description through a study of probability in practice. In Novotná, J., MoraováH., Krátká, M and Stehliková, N. (Eds.) *Proceedings of the 30<sup>th</sup> Conference of the International Group of the Psychology of Mathematics Education.* (Pp. 3-417 – 3-424). Prague: Faculty of Education, Charles University. (Published in Pythagoras)
- 10.6.13. Adler, J. (2006) Mathematics teacher education and teaching in diverse contexts: Insights from South African experience and research. Homi Baba Centre for Mathematics and Science Education. Mumbai. India (Published as book chapter – Portuguese)
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- 10.6.15.**Adler, J. (2005) Researching mathematics teacher education: The QUANTUM project and its progress. In Kasanda, C., Muhammed, L., Akpo, S. and Ngololo, E. (Eds). *Proceedings of the 13<sup>th</sup> Annual Conference of the Southern African Association for Resesearch in Mathematics, Science and Technology Education*. Windhoek: University of Namibia. Pp. 11 – 24.
- 10.6.16.Adler, J., Davis, Z., Kazima, M., Parker, D. & Webb, L. (2005). Working with students' mathematical productions: elaborating a key element of mathematical knowledge for teaching. In Chick, H.L. & Vincent, J. L (Eds.) *Proceedings of the 29th Conference of the International Group for the Psychology of Mathematics Education*. Department of Science and Mathematics Education. Melbourne University. Australia. Volume 2, pp.1-8.
- 10.6.17.**Parker, D., Davis, Z. and Adler, J. (2005) Mathematics for teaching and competence: Pedagogies in formalised in-service mathematics teacher education in South African Universities. In Goos, M., Kanen, C. and Brown, R. (Eds.) *Proceedings of the 4th International Mathematics Education and Society Conference. Centre for Learning Research*. Griffith University. Australia. Pp. 268-277.
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- 10.6.20.**Adler, J. (2003) Mathematical knowledge for teaching: Structural and conceptual issues in a formal degree programme. In Jaffer, S. and Burgess, L. (Eds.) *Proceedings of the Ninth National Congress of the Association for Mathematics Education in South Africa (AMESA)* Cape Town, July 2003. Cape Town. AMESA. Pp. 95 – 108.
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- 10.6.23.Adler, J. (2002) Inset and mathematics teachers’ conceptual knowledge in practice. In Malcolm, C. and Lubisi, C. (Eds.) *Proceedings of the 10<sup>th</sup> Annual Conference of the*

Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE). University of Natal, Durban. Pp II 1-9.

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- 10.6.25. Adler, J. and Lerman, S. (2001) Ethical practice in mathematics education research: Getting the description right and making it count. In *Proceedings of the 25<sup>th</sup> International Conference for the Psychology of Mathematics Education (PME25)*, Utrecht. Vol 2, pp. 17-24.
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- 10.6.30. Adler, J. (1997) Teaching cases and dilemma language: a potentially powerful tool in mathematics teacher education. In Sanders, M (Ed.) *Proceedings of the Fifth Annual Meeting of the Southern African Association in Mathematics and Science Education*. University of the Witwatersrand. Johannesburg. Pp. 197-203.
- 10.6.31. Adler, J. (1996) Lave and Wenger's social practice theory and the teaching and learning of mathematics. In Puig, L (Ed) *Proceedings of the 20th International Conference for the Psychology of Mathematics Education (PME20)*, Vol 2, Valencia University, Spain pp. 3-10.
- 10.6.32. Adler, J. (1995) Participatory, inquiry pedagogy, communicative competence and mathematical knowledge in a multilingual classroom: A vignette. In Meira, L and D Carraher (Eds) *Proceedings of the 19th International Conference for the Psychology of Mathematics Education (PME19)*, Vol 3, Universidade Federal de Pernambuco, Recife, Pp 208-215.
- 10.6.33. Adler, J (1994) One Teacher, One Method? In *Proceedings of the First National Convention of AMESA (Association of Mathematics Education in South Africa)*, University of the Witwatersrand, Johannesburg, Pp. 1-11.

- 10.6.34. Adler, J. (1992) Action research and the theory-practice dialectic: insights from a small post graduate study inspired by activity theory. In *Proceedings of the 16<sup>th</sup>. Psychology of Mathematics Education Conference*, Vol 1, Durham, Pp. 41-49.

### **10.7. Other published conference proceedings**

- 10.7.1. Leshota, M. & Adler, J. (2014) The analysis of teachers' mobilisation of the textbook. In Jones, K., Bokhove, C., Howson, G. and Fan, Li. (eds.) *Proceedings of the International Conference on Mathematics Textbook Research and Development (ICMT-2014)*, Southampton, GB, University of Southampton. Pp. 291-296.
- 10.7.2. Adler, J. & Patahuddin, S. M. (2012, July). Using scenarios validated as measures to explore SMK in an interview setting. Paper presented at The 12th International Congress on Mathematical Education (ICME-12). Seoul, South Korea.
- 10.7.3. Venkat, H. & Adler, J. (2011) Disaggregating procedural practice. Paper presented at the British Society for Research into Learning Mathematics. London Institute of Education, March 2011. And short paper SAARMSTE
- 10.7.4.** Adler, J (2008) ICMI in Africa and Africa in ICMI: The development of AFRICME. In Proceedings of the ICMI Centennial Conference, Rome, March 2008.
- 10.7.5. Adler, J (2008) Empirical and theoretical reflections on researching mathematics for teaching in mathematics teacher education. In Proceedings of the ICMI Centennial Conference, Rome, March 2008.
- 10.7.6.** Adler, J. (2005) Mathematics for teaching: What is it and why is it important that we talk about it? Notices of the South African Mathematical Society (SAMS). September. 36 (2): 85-113.
- 10.7.7.** Adler, J., Ball, D., Krainer, K., Lin, FL and Novotna, J (2004) Mirror Images Of An Emerging Field: Researching Mathematics Teacher Education. In Niss, M. (Ed.) Proceedings of ICME10 (Forthcoming)
- 10.7.8.** Sethole, G; Adler, J & Vithal R (2002) When AIDS goes to a Mathematics classroom: Is it a hindrance or a source for revising the mathematics classroom culture? In *ICMI Comparative Study Conference*, University of Hong Kong: Hong Kong (pp. 57 – 68).
- 10.7.9. Adler, J. (2001) Ways and means: Issues in professional development research. In Mutimucuo, I. V. (Ed.) *Promoting regional collaboration in research in mathematics, science and technology education in Southern Africa*. Proceedings of the 9<sup>th</sup> conference of the Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE). Universidade Eduardo Mondlane, Maputo. Pp. 401-410.
- 10.7.10. Adler, J. (1999) Redistribution of resources = equity? In Kuiper, J. (Ed.) *Proceedings of the 7<sup>th</sup> Annual Meeting of the Southern African Association for Research in Mathematics and Science Education*. University of South Africa. Harare. Zimbabwe. Rhodes University. Grahamstown. Pp. 23-32.

- 10.7.11. Adler, J. (1998) Doing a base-line study. In Ogude, N. A. & Bohlman, C (Eds.) *Proceedings of the Sixth Annual Meeting of the Southern African Association for Research in Mathematics and Science Education. University of South Africa (SAARMSE)*. Pretoria. Pp. 30-38.
- 10.7.12. Adler, J. (1997) Teaching cases and dilemma language: a potentially powerful tool in mathematics teacher education. In Sanders, M. (Ed) *Proceedings of the 5<sup>th</sup> Annual Meeting of the SAARMSE*. University of the Witwatersrand. Johannesburg. Pp. 197-203.
- 10.7.13. Adler, J. (1995) Communicative competence and mathematical knowledge in a multilingual secondary mathematics classroom. In Reddy, V (ed) **Plenary Address: Proceedings of the third annual SAARMSE conference**. January, 1995. Pp. 1-26.
- 10.7.14. Adler, J (1994) Researching teachers' awareness of their teaching in multilingual mathematics classrooms. In Glencross, M (1994) (Ed) *Proceedings of the Second Annual Meeting of SAARMSE, 27-30 January, 1994*. Univ of Durban Westville. Durban/ University of the Transkei. Umtata. Pp. 1-10
- 10.7.15. Adler, J. (1993) Moving beyond apartheid or more of the same? Political dimensions of national examining at the standard 7 level' with Siza Shongwe. In Julie C, Angelis, D and Z Davis (Eds) *Proceedings of Second International Conference on Political Dimensions of Mathematics Education (PDME2): Curriculum Reconstruction for Society in Transition*. Maskew Miller Longman/NECC. Cape Town. Pp. 376-381.
- 10.7.16. Adler, J. (1993) What does community education mean in transitional society and particularly for the learning and teaching of mathematics: A response to Munir Fasheh. In Julie C et al (Eds) op cit. Pp. 20-23.
- 10.7.17. Adler, J. (1993) Activity theory as a tool for a mathematics teacher-as-researcher. In Reddy, V (Ed) *Proceedings of the First Annual Meeting of SAARMSE*. Grahamstown. Pp. 53-57.
- 10.7.18. Adler, J. (1992) Small-scale action research: possibilities and constraints within the B Ed degree. In *Proceedings of Workshop on Research in Mathematics and Science*. Natal. Pp. 143-151. 1992.
- 10.7.19. Adler, J (1991) Into the Future: An analysis of the working document for mathematics, Std 2 – 4. In Olivier, A (Ed) *Proceedings of the 14th National Convention on Mathematics and Natural Science Education*. Macmillan Boleswa. Cape Town. Pp. 1-9.
- 10.7.20. Adler, J. (1991) Socio-political understanding and mathematics Teacher Education : reflections on a post graduate mathematics education course. In Olivier, A op cit. Pp. 10-19.
- 10.7.21. Adler, J (1989) The development of junior secondary mathematics materials for adult distance learners. In Hirst, A and K (Eds) *Proceedings of ICME-6*, Budapest, 1989.

10.8. **Other publications**

**Dissertations**

- 10.8.1. Adler, J (1996) *Secondary teachers' knowledge of the dynamics of teaching and learning mathematics in multilingual classrooms*. Unpublished PhD dissertation. University of the Witwatersrand. Johannesburg.
- 10.8.2. Adler, J (1985) *Mathematics by newspaper in South Africa: junior secondary mathematics for adults through the medium of a newspaper*. Unpublished M.Ed dissertation. University of the Witwatersrand. Johannesburg.

**Edited Volumes**

- 10.8.3. Adler, J. & Ball, D. (Eds.) (2009) *Knowing and Using Mathematics for Teaching. For the Learning of Mathematics*. Special Issue. 29. 1.
- 10.8.4. *Perspectives on mathematics for teachers*. Proceedings of a National Workshop. University of the Witwatersrand. Johannesburg. 2000
- 10.8.5. *Perspectives on the Third International Mathematics and Science Study (TIMSS). Proceedings of a National Seminar*. University of the Witwatersrand. Johannesburg. 1998
- 10.8.6. *Language, Culture and Critical Thinking for secondary school mathematics. Vol I* (Ed) Department of Education. University of the Witwatersrand. Feb 1991; Vol II, Feb 1992, Vol III, October 1993, Vol IV October 1995. Vol V November 1996.
- 10.8.7. *Girls in/and maths; maths in/and culture: ideas and activities for primary teachers* (ED) Department of Education. University of the Witwatersrand. Feb 1991.

**Research Reports**

- 10.8.8. Adler, J. & Pournara, C. (2014) FRF Chair project report 2010 – 2014, National Research Foundation, 31 March 2014
- 10.8.9. Adler, J., Dickson, M., Mofolo, B. & Sethole, G. (2001) *The use of written texts in Mathematics classrooms: A study of Grade 7 and 9 classes in selected Gauteng and North-west schools in 2000*. Johannesburg. School of Mathematics, University of the Witwatersrand.
- 10.8.10. Adler, J. (Team leader, major author), Bapoo, P., Brodie, K., Davis, H., Dikgomo, P., Lelliott, T., Nyabanyaba, T., Reed, Y., Setati, M., & Slonimsky, L. *Mixed-mode Further Diplomas in Education and their Effects: Summary Report on Major Findings of a Three-year Research Project*. Faculty of Education. Johannesburg. August 1999 (Team leader). Also published in *Open Learning Through Distance Education (OLDE)*. 6, 1, March 2000.
- 10.8.11. Adler, J. (Team leader, major author), Lelliott, A., Reed, Y., with Bapoo, P., Brodie, K., Davis, H., De Wet, H., Dikgomo, P., Nyabanyaba, T., Setati, M., & Slonimsky, L. *Mixed-mode FDEs and their effects. Interim Report June 1998*. University of the Witwatersrand. Faculty of Education. Johannesburg. June 1998

10.8.12. Adler, J., (Team leader, major author) Lelliott, T., Slonimsky, L. with Reed, Y., Bapoo, P., Brodie, K., Davis, H., De Wet, H., Dikgomo, P., Nyabanyaba, T., Setati, M. *A Baseline study: teaching/ learning practices of primary and secondary mathematics, science and English language teachers enrolled in the Wits Further Diplomas in Education programme.* Faculty of Education. University of the Witwatersrand. Johannesburg. July 1997

10.8.13. Teacher accounts of communicating secondary mathematics in diverse multilingual classrooms in South Africa. CSD. March 1994

10.8.14. *Looking Back, Inside and Ahead: an Evaluation of the Mathematics Education Project.* MEP. UCT. June 1995.

## 11. INTERNATIONAL/ LOCAL (NATIONAL) GUEST SEMINARS/VISITING LECTURER

**All the seminars from 2013 were based on results from my SARChI-NRF Chair and research related to professional development in mathematics and frameworks of analysis. I do not list the separate titles here. The range and spread internationally is indicative of the international interest in my current work.**

### 2016

- **Seminar: Oxford University, UK, October 2016**
- **Seminar: Leeds University, UK, October, 2016**

### 2015

- **Seminar:** University of Cambridge, UK, May 2015
- **Seminar:** Gotenburg University, Sweden, May 2015
- **Seminar:** King's College London, Nov 2015

### 2014

- **Seminar: University of Nottingham, UK, June 2014**

### 2013

- **Weizmann Institute of Science, Israel, Visiting researcher, January 2013**

### 2012

- **NCETM London seminar** – The MEC and QUANTUM-UK - 12 December, Institute of Education. London.

### 2011

- **Gauteng Department of Education presentation:** The transition from Arithmetic to Algebra: Why this is so important. Invited presentation, GDE MST Programme, Sept.

### 2010

- **Homi Bhabha Centre for Science Education - HBCSE - August;** invited presentation Seminar Mathematics Teacher Education in a context of curriculum reform.

### 2008

- **Oxford University, School of Education,** Invited Seminar Different similarities and similar differences: MfT across four case studies of secondary mathematics teaching. March



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- **University of Kwa-Zulu Natal**, School of Education, Invited Symposium presentation. Mathematics Education, democracy and development: Challenges for the 21<sup>st</sup> Century. 4 April.
- **University of Cape Town**. School of Education. Invited seminar. *Mathematical objects, reflections and grounds: shifting meanings across pedagogic contexts*. 18 April.
- **Institute of Education, University of London**, Invited Seminar, Different similarities in mathematics teacher education in South Africa: The case of working with student thinking. November.

#### 2007

- **Birmingham University, UK**, Midlands Mathematics Education Group Seminar, October 3. *Pedagogic 'models' and mathematical knowledge for teaching*.
- **Cambridge University, School of Education** – 19 November. *Mathematical objects, operations and grounds: shifting meanings across pedagogic contexts*.
- **Institute of Education, London Mathematics Education Group Seminar** – 5 December. *The relationship between mathematics and mathematics teacher education*.

#### 2006

- **Bogota, Colombia, Ministry of Education, Conference on mathematical competencies in tertiary education, including teacher education**. November 2006, presentation on The preparation and professional development of mathematics teachers: Challenges, initiatives and innovations in post-apartheid South Africa.
- **Marang Centre, Wits University, PhD seminar series**. March 2006, presentation on the QUANTUM project, its development, outputs, progress, and challenges.

#### 2005

- **Tata institute – Centre for Science Education – Mumbai, India**, to run workshops and discussions with staff on building a research agenda in multilingual mathematics education and teacher education. **November – December**
- **Charles Sturt University, NSW, Australia – November 6 – 11, 2005** - invited by Prof R Zevenbergen, to work with academic staff in the School of Education on their research development. Delivered a paper and held workshops and discussions with various academic staff.
- **Southbank University, London** – October 17 – 21, 2005, part of BC Higher Education Links Programme. Gave presentation to academic staff on my current research. Worked with Professor Lerman to develop continuing research collaboration
- **University of Pretoria, School of Mathematics** – Invited seminar to MUTI (Mathematics undergraduate teaching initiative) research group. July 2005.
- **Studying mathematics for teaching inside teacher education**. Workshop at ICMI Study15 on Teacher Education, Brazil, May 2005.

#### 2004

- **University of Kwa-Zulu Natal, School of Education, Pietermaritzburg campus**. Invited research seminar on building a research community. June 2004

#### 2003

- **School of Education** – University of the Witwatersrand - Work in progress seminar, October 2003.
- **Mathematics Multilingual Group within PME**: Discussant of paper, July 2003.

#### 2002

- **University of Michigan, USA** – Visiting Professor: August – December  
Seminar: Researching (Ma 1999) mathematics teaching and teacher education, November, 2002  
Seminar: Conceptualising equity issues in mathematics education, September, 2002

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- **University of Chicago Illinois: USA**  
Invited seminar and guest lecture: Teaching mathematics in multilingual classrooms, November 2002.
- **University of Toledo, Michigan: USA**  
Invited guest lecture: Mathematical practices in and across contexts. November 2002.
- **Michigan State University, USA** – Visiting Professor: April – May  
Seminar: Mathematics teacher education in South Africa: Focus on research
- **University of Alberta, Edmonton, Canada** – Guest speaker: May  
Title: Researching mathematics teacher education – focus on South Africa

## 2001

- **University of Wisconsin-Madison: May 2001**  
Researching mathematics teacher education  
Incomplete journeys: Languages practices across maths, science and English classes in South Africa
- **Michigan State University, East Lansing: May 2001**  
Getting the description right and making it count: Ethics and mathematics education research.
- **University of Michigan, Ann Arbor: May 2001**  
Teaching mathematics in multilingual classrooms
- **Eduardo Mondlane University, Maputo, Mozambique, November 2001**  
Researching mathematics teacher education  
Researching teachers' concepts of limits and/or inequalities

## 1999

- **University of Gothenburg and the Multicultural Centre, Stockholm, Sweden, Faculty Lecture.** *Dilemmas of teaching in multilingual settings.* 22 March 1999
- **University of Gothenburg and the Multicultural Centre, Stockholm, Sweden, Invited guest lecturer.** Full day workshop with teachers attached to the Centre project on *the teaching and learning of mathematics in multilingual settings.* 22-23 March 1999
- **Royal Danish School of Educational Studies, Copenhagen, Faculty PhD Seminar, 24 March 1999.** *Qualitative research methodology in mathematics education research.*
- **Faculty of Education Seminar, Michigan State University, 28 May 1999.** *Researching Mathematics Teacher Education.*
- Invited guest lecture: **Gauteng Institute of Education.** Integration within and across mathematics. GICD Centre. Johannesburg. 4 August 1999.

## 1998

- **Sheffield Hallam University, Centre for Mathematics and Science Education**, Sheffield, UK, 14 September 1998. *Teaching and learning mathematics in multilingual settings.*

## 1997

- **Open University, Centre for Mathematics Education, UK, July 22 1997.** *Teacher education in South Africa.*

## 1996

- **Open University, Centre for Mathematics Education, United Kingdom** - 25 March 1996 *The dilemma of transparency in teaching mathematics in multilingual classrooms.*

## 1995

- Invited guest lecturer, **UNITRA 10 - 11 October**, seminars on qualitative research methods in general and working in multilingual maths classroom in particular.

## 1994

- **University of Sydney**, Faculty of Education, 10 May 1994.
- **Monash University, Melbourne Australia**, School of Post Graduate Studies in Education, 12 May 1994.
- **Griffith University, Faculty of Education**, Gold Coast Campus, 16 May; Brisbane Campus, 17 May. '*Educational Challenges in the New South Africa: with particular focus on mathematics education*'.

## 12. POST-DOCTORAL FELLOWSHIPS

- Oct 2000 – Dec 2001** **Dr Willie Mwakapenda, Malawi.** (PhD, Deakin University Australia, Now Professor of Education at Tswane University of Technology, SA)
- Apr 2004 – Dec 2005** **Dr Mercy Kazima, Malawi** (PhD, University of Leeds, UK, now Associate Prof, University of Malawi, Chancellor College)
- March - Nov 2009** **Dr Helena Miranda from Namibia** (PhD from Alberta, Canada, now Senior Lecturer, University of Namibia)
- Jan 2011– Dec 2012** **Dr Femi Otalaja** (PhD from USA, now a lecturer at Wits)
- June 2011 – Dec 2012 -** **Dr Sitti Pattahudin – Indonesia** (PhD University of Queensland, Australia, now a lecturer in Canberra Australia)
- Oct 2012 – Dec 2013** **Dr Thuli Nkambule - Swaziland** (PhD from UNISA, South Africa)
- March 2013 – Mar 2015** **Erlina Ronda – Philippines** (PhD from Catholic University, Australia, back at the University of the Philippines)
- Sept 2015 – Jun 2017** **Dr Jehad Alshwaick – Palestine** (PhD from Institute of Education, London)
- Jan 2016 – Dec 2016** **Dr Forster Ntow – Ghana** (PhD from University of Minnesota, USA)
- Jan 2017 -** **Dr Moneoang Leshota** (University of Lesotho, PhD from Wits, SA)

## 13. SUPERVISION OF HIGHER DEGREES

### 13.1. PHD - DOCTORAL STUDENTS

Since 1998, when I took on my first PhD students, 18 (12 South African, 2 Lesotho, 1 Mozambique, 1 Nigeria, 1 Zambia; 1 Botswana; 7 males, 11 females; 9 black, 9 white) have successfully completed their theses under my supervision. Currently (2017) I supervise 4 students (3 women, 2 black South Africans, the third from Gambia).

### 13.2. SUPERVISOR: Registration and graduation dates provided in brackets

#### • Graduates

**Mellony Graven:** Mathematics teachers' learning, communities of practice the centrality of Confidence. Part-time (1998, Graduated June 2002)

**Thabiso Nyabanyaba:** Examining examination: The O Level mathematics examination in Lesotho and the impact of recent trends on Basotho students' epistemological access. (1998, Graduated June 2002) Full-time.

**Mamokgethi Setati:** Language practices in multilingual classrooms in South Africa. Part-time (1998, Graduated June 2002)

**Margot Berger:** The appropriation of mathematical objects by undergraduate mathematics students: A study. Part-time (1998, graduated April 2003)

- Lorraine Marnewick:** Curriculum Change in Northern Province Primary Schools. Co-supervisor with Prof Pam Christie, Griffiths University, Australia. Part-time. (1997, *Graduated. 2005*)
- Godfrey Sethole:** Learner's perspectives on mathematics in the new curriculum (2001, *Graduated. 2005*) *Deceased.*
- Dany Huillet:** Evolution through participation in a research group of Mozambican secondary school teachers' personal relation to limits of functions. (2001, *Graduated 2007*)
- Diane Parker:** Knowledges and discourses in mathematics teacher education in higher educational institutions in SA in the early 21<sup>st</sup> century. Part-time. (2001; *graduated April 2009*)
- Bruce Tobias** From textual problems to mathematical relationships: Case studies of secondary students and discourses at play in interpreting word problems. Upgrade from M Sc research report to PhD. (*Part-time, graduated July 2010*).
- Kate Bennie** A critical examination of the Discourse practices used by students when solving real – world problems in an undergraduate access course in Mathematics (*PT 2006; Graduated in November 2011*)
- Craig Pournara** Mathematics-for-teaching in pre-service mathematics teacher education: The case of financial mathematics. (*PT 2006; Graduated March 2013*)
- Lynn Bowie:** The production of school geometry in the new FET curriculum in South Africa. Proposal submitted and passed. (FT 2006, PT 2010, *Graduated November 2013*)
- Tony Essien** Pedagogical Practices of Teacher Educators Preparing pre-service teachers for teaching mathematics in multilingual classrooms. Co supervision with Professor Setati. (FT 2007, PT, 2010, *Graduated June 2013*)
- Patricia Phiri** Student teachers knowledge and positioning with respect to learner thinking in mathematics teaching. (*July 2008, FT, graduated 2014*)
- Vasen Pillay:** Teacher development through focus on examples: the case of functions in Gr 10 (*Apr 2010, FT, graduated 2014*)
- Shadrack Moalosi:** The constitution of mathematics for teaching in professional development and teachers professional knowledge: what is the relationship? (*Jan 2010, FT, graduated 2015*)
- Moneoang Leshota:** The textbook – teacher relationship: The case of functions in Grade 10. (*October 2009, FT, graduated 2015*)
- Regina Essack:** Exploring Grade 11 learner routines on function from a commognitive perspective (*Jan 2011, graduated 2016*)
- **Writing up**  
**Nontsiki Luxomo** Explaining explanation through recontextualising practices (Jan 2012)
  - **Data collection**  
**Lizeka Gcasamba** Mathematics teacher learning through Lesson study (Jan 2015)
  - **Data Collection to begin 2017** (registered January 2016)  
**Fatou Sey**

### 13.3. SUPERVISION KCL

While at King's College London, I have co-supervised two doctoral students to completion

**Damon Vosper Singleton** – co-supervisor Dr Clive Kanes, major supervisor – graduated 2014  
**Frieda Vatileni** – current major supervisor Prof Eva Jablonka – minor corrections Dec 2015

#### 13.4. ASSISTANT SUPERVISOR

- **Associate supervisor for Surgeon Xolo – PhD student at Cambridge University – Graduated December 2012.**
- I was the **South African advisor - thus at level of assistant supervisor** - to three students who were part of a PhD programme run by Prof Olé Skovsmose from the Royal Danish Institute in Copenhagen, Denmark. All three are from Kwa-Zulu Natal, all registered at Aalborg University for their degrees.

<b>Dr B Naidoo</b>	(Graduated 1999)	
<b>Dr R Vithal</b>	(Graduated 2000)	all part-time
<b>Dr N Dlamini</b>	(Graduated 2001)	

#### 13.5. PHD COMMITTEE MEMBER (For external examination ONLY)

I was on the PhD Examining Committee for two PhD candidates at University of Twente in The Netherlands:

**Dr Sara Howie – graduated 28 June 2002**

**Dr Pauline Vos – graduated 28 June 2002**

Both theses were based on secondary analysis of TIMSS and TIMSS-R data in South Africa and The Netherlands respectively. The studies were done under the supervision of Prof Tjeerd Plomp of the International Association for the Evaluation of Educational Achievement (IEA), in the Netherlands.

#### 13.6. M SC / M ED RESEARCH REPORT SUPERVISION

Rakgokong, L	'Language and the Construction of Meaning Associated with Division in Senior Primary Mathematics'. Graduated 1993. M Sc
De Wee, K	'A Critical Examination of Decision-making structures in a DET College of Education'. Co-supervised with Shirley Pendlebury. Graduated 1993. M Ed
Diphofa, J	'Teachers Perceptions of Their Role in Curriculum Development: a Comparative Study of Two Soweto Primary Schools'. Co-supervised with S Pendlebury. Graduated 1993. M Ed
Dikgomo, P	'Misconceptions of Inequalities in Std 8: a constructivist perspective'. Graduated 1994. M Sc.
Akoojee, S	'A Critical Analysis of Teaching Practice as a Component of Initial Teacher Education at a College of Education in South Africa'. Co-supervision with S Pendlebury. Graduated 1995. M Ed.
Brodie, K.	'Classroom Discourse and ownership of Mathematical Knowledge'. Graduated 1995, <b>with distinction. M Ed.</b>
Scott, G	'Applicability of Mathematics in Technical Curricula'. Graduated 1996. M Ed.
Setati, M	'Code switching and mathematical meaning in a Std 3 mathematics class'. Graduated 1996. M Ed.
Berger, M	'The graphical calculator as a mediating sign in the learning of tertiary mathematics'. <b>Graduated with distinction</b> , August 1996. M Sc.
Mnisi, P	(co-supervisor Prof Pendlebury). Investigation of extent to which CAPME fosters reflective stance in its teachers. Graduated 1997. M Ed.

- Rademeyer, A 'Recognition of prior numeracy learning at ABE levels 1 and 2'. Graduated 1997. M Ed.
- Mphunyane, M 'Mathematics teachers' perceptions of their role in relation to ESL pupils' problems with language'. Graduated 1997. M Ed.
- Nyabanyaba, T Teachers' understanding of relevance as a curriculum concept. Graduated 1998 **with distinction**. M Ed.
- Khechane, N An investigation into an INSET mathematics project in Lesotho. Graduated 1998. M Ed.
- Dickson, M The internet and mathematics learning. Graduated 1999. M Sc
- Ramsing, V 'The extent to which MCPT teachers have changed in the direction the programme intended'. Graduated June 2000. M Ed.
- Mokapi, C Fraction conceptions in Grade 10 in Lesotho: a case study. Graduated 2001. M Sc.
- Mofolo, B. The mathematics textbook: prescriptive or enabling resource for teaching and learning. Registered part-time 2000. Graduated, 2003. M Sc.
- Tobias, B. Cultural models at work in the solving of algebraic 'word' problems. M Sc. (Registered part-time in 2002, **passed with distinction, upgraded to PhD in 2004**)
- Rodwell, L. Learners' experiences and perceptions of new assessment practices: A case study. M Sc. Part-time, graduated November 2006.
- Pillay, V. Mathematics for Teaching: The case of functions in Grade 10. M Sc. **Graduated with distinction, November 2006**
- Tatolo, T. Mathematical work of teaching: A case study of Grade 8 algebra in a private school in Johannesburg. **Graduated with distinction for research report, November 2007**
- Naidoo, S. Mathematical work of teaching: A case study of Geometry in Grade 10 in a suburban secondary school in Johannesburg. M Sc. *Graduated. 2008*
- Bennett, S. Mathematical work of teaching: A case study of Grade 7 fractions in a suburban primary school in Johannesburg. *Graduated 2008.*
- Luxomo, N. The constitution of the legitimate text in official and pedagogic discourse: The case of patterns in Grade 11. **Graduated 2011 (research report with distinction)**
- Bogdanova, M Object and meta-level learning of congruency in Grade 9. **Graduated November 2012 (research report with distinction)**
- Clarke, R. Exploring and describing growth points of learners as they encounter functions in equation form. **Graduated July 2014**
- Gcasamba, L. A discursive analysis of learners' mathematical thinking: The case of functions. *Graduated July 2014*
- Ramaisa, M. Investigating an intervention, informed by variation theory, into Grade 11 learners' interpretations of algebraic functions. *Graduated December 2014*
- Makhalyane, M. An investigation into competent teachers' choice and use of examples in teaching algebraic functions in Grade 11 in the South African context: A case of two teachers. *Graduated December 2015*

### 13.7. B ED/ B SC HONOURS RESEARCH PROJECTS:

Since joining the University in 1989, I have supervised 50 successful Honours level research projects, all in the field of Mathematics Education. Specifically,

- 2005: 5 B Sc Hons projects focussed on Unpacking Mathematics in My Teaching
- 2004: 6 B Sc Hons projects focused on Learners' conceptions of Area and Perimeter
- 2003: 5 B Sc Hons projects focused on Learners' conceptions of Area and Perimeter
- 2002: Sabbatical leave
- 2001: 4 B Ed Hons projects on various topics – see below

2000: 4 B Ed Hons projects in the field of mathematics education – see below

1997: one project

1989 - 1996: 25 B Ed Hons projects in the field mathematics education – see below.

The work produced in and across **B Ed Hons project**, have spanned numerous topics of interest to students, and in many cases involved small-scale action research. Educational issues explored have included ethnomathematical practices in the teaching of mathematics, equitable pedagogic strategies, language and learning; other projects have been studies focused on a particularly mathematical topics (e.g. teaching fractions; exploring learners' conceptions).

Due to what is arguably a productive pedagogy in inducting first level graduate students into research, the projects have in the main been of high quality, and moreover, in the teachers' views effective in encouraging reflection on practice. The following are examples of some of the projects that have been completed.

- Action-research on the constraints on teaching and learning through games in the mathematics classroom
- A teaching experiment on the learning of the multiplication concept
- Using action research to evaluate my teaching
- Students' perceptions of the value of group discussion in their learning of mathematics in multilingual classrooms
- Grade 8 students' responses to and reasoning behind solutions to selected problems involving linear equations
- Grade 6 students' responses to and reasoning behind solutions to selected problems with decimal fractions.
- Grade 9 learners responses to and reasoning on the concepts of area and perimeter and their inter-relation
- Unpacking mathematics in my teaching: The case of functions in a Grade 10 class.

It is important to note here that the majority of teachers in the Honours programme are studying part-time. Most are teaching in multilingual and often economically disadvantaged schools. Their systematic study of their own teaching, and/or learners in their schools and classrooms has contributed not only to their own practice, but to increasing understanding of the different possibilities and constraints on mathematics education reform across our ranging conditions.

#### **14. ACADEMIC & PROFESSIONAL TEACHING EXPERIENCE, and CURRICULUM INNOVATION (including conceptualisation and development of formal professional development programmes in mathematics and science education).**

In my 27 years as an academic, I have led curriculum innovation teams in relation to new degrees/diplomas at Wits University, particularly in **mathematics and science in-service teacher education**, and taught courses in **mathematics education** at Undergraduate and Postgraduate levels. I have also taught more general courses in **research methods** and **curriculum**. In my current position as SARChI FRF Chair and through the research and development work with teachers in ten Gauteng schools, I have, with project colleagues, developed **20-day professional development courses for teachers, focused on subject knowledge for teaching**. These courses are elaborated on the WMCS website.

Below is a brief description of university-based and accredited curriculum innovations, followed by a list of some of the courses taught at each level so to provide insight into the teaching content:

**14.1. Teaching and Curriculum Innovation – focused on formal in-service teacher education/professional development.**

- **Post Graduate: B Sc Honours in Mathematics and Science Education**

In 2000-2001 I initiated and developed the curriculum for a new **Honours Programme in Science and Mathematics Education**, aimed at senior and leader teachers of these critical subjects in the secondary school system. This programme has been sustained and is now in its 13<sup>th</sup> year. The major motivation and incentive in this programme is the opportunity to extend teachers' subject knowledge in ways that are useful to teaching. Previous honours level programmes were either all educationally focussed with little attention to subject knowledge per se, or where subject knowledge was included, courses taken had to be the same as those studying pure mathematics at an honours level. This was inappropriate and fewer and fewer students selected to do these kinds of programmes.

*Note: In its first four years, this programme ran as a partnership with the Gauteng Department of Education. The province provided full bursaries for Gauteng teachers accepted into the programme. The collaboration with the Provincial department at a time of rapid curriculum change in South Africa was extremely productive for both institutions and particularly for teachers whose professional development was actively supported by their employer. After a two-year break, the province once again funded this programme in a new three year cycle, beginning 2008. An independent evaluation of the programme in 2004 was very positive. A few hundred teachers in Gauteng Province have graduated from the programme, most of whom continue to play leadership roles in their schools. I am aware that a number of these teachers now hold positions in their district offices, or in university teacher education.*

- **Further Diploma in Mathematics, Science and English Language Teaching FDE (now renamed as Advanced Certificate in Education – ACE).**

Between 1995 and 1997 I was Overall co-ordinator of curriculum development in the **Further Diploma of Education Programme for Mathematics, Science And English Language Teaching**, having led the process of establishing this new qualification in the University. This entailed leading a team of course developers in conceptualising an integrated and coherent curriculum for education, methodology and discipline courses, as well as developing ways in which these will operate at a distance. FDEs were relatively new initiatives in South Africa at that time – aimed at enabling disadvantaged teachers to upgrade qualifications - with little to guide the innovative programme. A particular challenge here was constructing mathematics courses that would extend teachers' subject knowledge in ways that were useful for teaching. FDEs have been replaced by ACEs Advanced Certificates in Education.

Both of these programmes entailed dealing with rules and procedures for new courses and degrees in the University, as well as the management of staff in them. Moreover, they have had and are continuing to have an impact on the development of teachers' mathematical knowledge, their pedagogic content knowledge and our knowledge of the specificity of mathematics for teaching.

At the same time as the FDE programme was initiated and developed, I set up and directed an NRF-funded research project for all academic staff in the program, to investigate teachers' learning in such a program. This research activity was instrumental in building research and teaching capacity across staff in the program, all of whom (except myself) were novice researchers. It is of note that Professors Mamokgethi Setati-Phakeng and Karin Brodie, and Associate Professor Yvonne Reed were researchers on this programme. The products of that research are reported below, and include a book



that has received favourable reviews in South Africa for its relevance and scholarship, and gone into a second print.

#### **14.2. Teaching: Post Graduate Courses/ Seminar programmes**

*(In my position at King's College, London, and being there only for specific periods in the year, I contributed to Masters level courses, and assist with PhD supervision and upgrades).*

**PhD: Researching mathematics education across domains of practice** (This is not a formal course, but an informal programme for PhD students in Mathematics Education.)

**1998 – 2002 Initiated, conceptualised and ran a PhD program in Mathematics Education in the School of Mathematics/School of Science Education at Wits.** This was a co-ordinated series of workshops during the year through which a cohort of PhD students were supervised and supported. By 2003, four of my students had completed and graduated with their PhDs, and all are now either Associate of Full professors and in senior university positions. Since the move of all mathematics education activity to the School of Education, and the establishment of the Marang Centre (see below) and an increase in suitably qualified mathematics education staff, including the graduates noted above, the running of the PhD programme has been taken over by other staff. Further PhD graduates are listed below.

*Between August and December 2002, and during my sabbatical year, I was a visiting professor in the School of Education at the University of Michigan in the US. While there I taught a graduate (PhD) course “Equity and Diversity in Mathematics Education”.*

**Masters:** Since 1993 I have taught and conceptualized (see those marked \*) a range of masters degree courses in mathematics education, mathematics and science education, and curriculum

- Teaching and learning algebra\*
- Issues in Curriculum\*
- Curriculum Issues in Mathematics Education\*
- Language and Communication in Mathematics Education
- Theories of learning and teaching mathematics\*
- Research methods and design in Mathematics and Science Education\*

**Honours:** As noted I led much of the curriculum innovation in the overall Honours programme for Mathematics and Science Educators. The particular courses I have conceptualized and taught are

- Connecting mathematics
- Pedagogy and Diversity in Mathematics Education
- Teaching mathematics in multilingual classrooms
- Research project in mathematics education honours

#### **14.3. Teaching: Undergraduate Courses**

- Concepts in mathematics
- Further Diploma in Education – assisted with course materials writing and teaching. This included both mathematics and mathematics education courses.
  1. Tutoring in UG Education courses (Sociology of Education; Psychology of Education)
  2. Higher Diploma in Education: Curriculum, curriculum development and reflective practice;
  3. HDE: Secondary Maths Methodology – occasional lectures; teaching practicum
  4. B Primary Ed. Professional Studies in Mathematics.

#### 14.4. School Mathematics teaching

- 1977 - 1985. Cambridge O-levels; EIC Matriculation Winter school mathematics.
- 1976 - 1976 Secondary mathematics, Grades 8 – 12, KDHS, Johannesburg.
- 1974 - 1975. Secondary mathematics, Grades 9 – 12, Harold Cressy High, Cape Town.

#### 14.5. Out-of-school (non-formal/adult) educational experience

- 1977-1985 - SACHED TRUST (an independent, non-profit educational trust).
- **Course Development for Distance Education Students.** Writer and/or editor of:
  - \* Set Theory for std 6 - 8 (writer, 1977). Published in educational supplement to Weekend World, called People's College.
  - \* Basic arithmetic for adults (editor, 1978). This course was extensively tested on a group of factory workers and then reworked by both the writer and myself.
  - \* Pitmans Elementary Arithmetic Course (writer of the introductory lessons and of the book on measurement; editor of the remainder of the course, 1979). Published in supplement to Sunday Post, called Learning Post.
  - \* Basic Algebra (writer of section on equations and inequalities, extensive revision and editing of remaining materials, 1980). Published in Learning Post.
  - \* How to read and understand graphs (writer, 1980)
  - \* The Turret Junior Maths course:
    - Ratio and Proportion (writer, 1985)
    - Geometry Book 4 (editor, 1983) More about theorems, circles and parallel lines
    - Geometry Book 7 (editor, 1983) Constructions
    - Graphs Book 1 (editor, 1984)
    - Graphs Book 2 (editor, 1985)
    - Using the Calculator (writer, 1985)
- 1977 - 1980
  - editor of other formal and also non-formal educational material for newspaper supplements.

#### 14.6. Organisational, Training and Management Experience

- Educational development for SACHED's Teacher Upgrading Project (1977 - 1978).
- Head of the Research and Development department, SACHED, 1978 - 1979.
- Acting Head of Department of Education at Wits – Jan-Jun 1997
- Chairperson: School of Science Education: 2000-2002
- Unit head: Mathematics Education, School of Education 2003 – 2004
- Acting Director: Centre for Mathematics and Science Education. Dec 2004 – May 2005
- Division head: Mathematics and Science Education – 2005 –Dec 2006
- Director Marang: Jan – Dec 2008

**15. ADDITIONAL ACADEMIC AND PROFESSIONAL EXPERIENCE (SERVICE TO UNIVERSITY/PROFESSION/DISCIPLINE/ COMMUNITY)**

- 15.1. **ICME13 Topic Study Group Co-Chair** 2016, Secondary teachers' professional development. Germany. Co Chair Yudong Yang, Japan.
- 15.2. **ASSAf STEM committee: Chairperson** – enabled the development of a forum on key issues in mathematics and science education in 2009, and a follow up forum on “minding the gap” between school and university science in 2010.
- 15.3. **Programme Advisor, AFRICME3 Congress**, Botswana, May 2010
- 15.4. **Visiting scholar: Rhodes University, Department of Education, October 2009.**
- 15.5. **South African Mathematical Society (SAMS)** mid-year conference and focus on mathematics teacher education in South Africa. *Mathematics teaching and mathematics teacher education.* 1 August 2008. Presentation.
- 15.6. **ICME11 Topic Study Group Co-Chair** 2008, Mathematical knowledge for teaching. Mexico. Co Chair, Deborah Ball, USA.
- 15.7. **Programme Advisor, AFRICME2**, Nairobi, Kenya, May 2007.
- 15.8. **Congress and Programme Chair: First African Regional Congress of ICMI (AFRICME1), 22 – 25 June 2005, University of the Witwatersrand,**
- 15.9. **Editorial boards: MERJ, JRME, RME**
- 15.10. **Reviewer for peer-reviewed journals**

I regularly review articles for the following refereed journals, national and international. I review more papers for those journals where I am on the editorial board (see above).

- For the Learning of Mathematics
- Teaching and Teacher Education
- Journal for Research in Mathematics Education
- Mathematics Education Research Journal
- South African Journal of Education
- Educational Studies in Mathematics
- American Education Research Journal
- Perspectives in Education
- African Journal for Research in Mathematics, Science and Technology Education
- Education as Change
- Pythagoras

**15.11. Collaboration with Provincial Department of Education**

The Current Chair project involves collaboration with the Provincial Education Department and the district in which the schools we work with are located.

Between 2000 and 2004, established and managed a partnership with the Provincial Government Department of Education. In order to reinvigorate mathematics and science teaching in secondary schools, designed a new honours' programme for senior teachers in the field. Their studies were funded by the Department (up to 50 students p.a.).

**15.12. External examiner**

PhD: I have been external examiner for numerous PhD studies across institutions in South Africa and other countries across the world e.g. IoE, University College London; Griffiths University, Monash University, and Latrobe in Australia; University of Twente in the Netherlands

M Ed Numerous research reports from UCT, UND, Rhodes, UPE; University of Botswana

M Ed Course work examiner for UCT Mathematics Education courses.

B Prim Ed: External examiner for Mathematics Professional Studies at JCE/Wits.