Table of contents 2002

Section I: Plenary Papers and Abstracts

Values and policy: bridging the gap in mathematics education
Alan J. Bishop & John D. Volmink ................................................................. 1

A transformative practice in science education: what is it? What does it look like?
Images from South African classrooms
Loyiso Jita ........................................................................................................ 10

Looking back to look forward: 10 years of SAARMSTE
Panel of past chairs of SAARMSTE .............................................................. 24

Section II: Long Papers

Inset and mathematics teachers’ conceptual knowledge-in-practice
Jill Adler ........................................................................................................ 1

The impact of two different ways of assessment of the chemistry laboratory classes
in the basic science course at the Eduardo Mondlane University
Viriato N. V. Chevane .................................................................................... 9

To “tell” or not to “tell”: a reformulation of “telling” and the development
of an initiation/eliciting model of teaching
David Clarke & Joanne Lobato .................................................................... 15

Joining the club: identity and inclusion in mathematics classrooms and in
mathematics education research
Tony Cotton.................................................................................................... 23

Teachers, textbooks and pedagogy: studying maths for all in primary classrooms
P. Ensor, T. Dunne, J. Galant, F. Gumedze, S. Jaffer, C. Reeves & G. Tawodzera ....... 30

On the association of differences in classroom context with differences in attitudes to
science teaching and philosophy of science amongst a level biology teachers in
Harare Zimbabwe
Eric Gwimbi & Martin Monk ........................................................................ 38

Investigating whether using a computer as a tutor could enhance 1st year Peninsula
technikon science students conceptual understanding of electrical concepts
A. J. Hendricks ............................................................................................... 47

Teaching physics through an indigenous language: a Shona-physics case study
A. Madzudzo .................................................................................................. 54
“Do I still remember?” Using concept mapping to explore student understanding of key concepts in secondary mathematics
Willy Mwakapenda & Jill Adler ................................................................. 60

Border crossing and the contiguity learning hypothesis
M. B. Ogunniyi ....................................................................................... 68

Pilot outcomes from a foundation science programme in an open supported learning context: dilemmas and tensions for change
Marissa Rollnick & Susan Tresman ....................................................... 76

Secondary school biology learners’ difficulties in interpreting diagrams of biological sections
Martie Sanders ...................................................................................... 85

The promise of problem-based learning for training pre-service technology teachers
A van Loggerenberg ............................................................................ 95

Section III: Short papers and round tables

The validity of experimental measurements in physics: the understanding of open supported learning students
Claudia Albers, Fred Lubben, Marissa Rollnick, Wayne Bantom, Abdool Bapoo, Phil Ferrer, Simphiwe Fikizolo, Deena Naidoo .............................................. 2

Constructing a research-based framework for a first year physics laboratory curriculum
Saalih Ailee, Andy Buffler, Fred Lubben & Bob Campbell ......................... 4

Investigating acquisition of the language of science by science education students: initial and progressive comprehension; towards intervention
Olufunmilayo Amosun & Buyiswa Taho ............................................... 5

Using meta-analysis to develop a database of students’ conceptual and reasoning difficulties (CARD)
T. R. Anderson & J. McKenzie ............................................................... 11

Evaluating South African curriculum interventions: exploring the development of reasoning skills, classroom climate and discourse strategies as a triangulation
Pam Austin, Lesley Foster, Notozi Mgobozi, Viv England, Paddy Lynch, Paul Webb, Derek Potgieter & Scott Linneman .............................................. 17

An investigation into teachers’ knowledge in algebra
Sarah Bansilal ...................................................................................... 22

Public understanding of science through service learning
Wayne Bantom, Marissa Rollnick & Margaret White ................................. 27

The tyranny of blessedness of marks
Irene Broekmann & Lesley Henning ........................................................ 30
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science teaching and HIV/AIDS education in Namibian secondary schools</td>
<td>Bob Campbell &amp; Fred Lubben</td>
<td>35</td>
</tr>
<tr>
<td>Gender differences in the pattern of teacher-pupils’ interactions in secondary mathematics classrooms in Mozambique</td>
<td>B. Cassy</td>
<td>41</td>
</tr>
<tr>
<td>Usefulness of science and mathematics centres in Zimbabwe</td>
<td>K. Chavhunduka, C. Fumhanda, F. joko, V. Manokore, S. Mupezeni &amp; D. Musademba</td>
<td>45</td>
</tr>
<tr>
<td>STARIS (Science Teachers As researchers In Schools): is it research or professional development</td>
<td>Ann Childs &amp; Brianne E. Woolnough</td>
<td>50</td>
</tr>
<tr>
<td>Decreasing noise in a chemistry laboratory – improving a practical for access students</td>
<td>Bette Davidowitz, Marissa Rollnick &amp; Cynthia Fakudze</td>
<td>54</td>
</tr>
<tr>
<td>Creating science education professional learning communities in Eastern and Southern Africa: the role of universities</td>
<td>Loe de Feiter</td>
<td>60</td>
</tr>
<tr>
<td>Pre-service teachers’ views about teaching science: an example of an action research</td>
<td>Betty T. Dlamini</td>
<td>69</td>
</tr>
<tr>
<td>Content analysis of arrow symbolism in biology textbooks</td>
<td>Lynn du Plessis, Trevor R. Anderson &amp; Diane J. Grayson</td>
<td>74</td>
</tr>
<tr>
<td>Changing classroom culture in science &amp; mathematics in South African schools: the Anglogold 5 star project</td>
<td>Hugh Glover, Paddy Lynch, Jeff Ilsley &amp; Paul Webb</td>
<td>80</td>
</tr>
<tr>
<td>Beyond statistics – a suggested role for the methods of computational intelligence in educational research and data modelling</td>
<td>John Greene and Biddy Greene</td>
<td>83</td>
</tr>
<tr>
<td>Students difficulties with different models in acid-base chemistry</td>
<td>Sheelagh E. Halstead, Trevor R. Anderson &amp; Sally Spankie</td>
<td>87</td>
</tr>
<tr>
<td>An investigation of factors which contribute to low numbers of Zambian females choosing to train as secondary school science teachers</td>
<td>Christopher Haambokoma</td>
<td>93</td>
</tr>
<tr>
<td>Reclaiming the meaning of problem solving: the need for a common understanding of the terms problem and problem solving</td>
<td>Paul Hobden</td>
<td>98</td>
</tr>
</tbody>
</table>
Adapting to change: towards an integrated style of mathematics education for preservice teachers
Sally Hobden ................................................................. 104

Towards developing a profile of South African grade 8 science teachers
Sarah J. Howie & Diane Grayson .................................................. 110

School and classroom level factors and pupils’ achievement in mathematics in South Africa: a closer look at the South Africa TIMSS-R data
Sarah J. Howie & Tjeerd Plomp .................................................. 116

Evolution of in-service and pre-service teachers’ conceptions of limits of functions, through participation in a research community
Danielle Huillet ................................................................. 124

Student difficulties with a diagram of the complement pathways in the immune system
Tracy L. Hull, Trevor R. Anderson & Diane J. Grayson ......................... 129

On the role of “context” in school mathematics
Eva Jablonka ................................................................. 135

Science for special educational needs learners: feeling the way forward
Sally Johnson, Martin Monk, Melanie Sadeck & Merle Hodges ................ 140

A study of the use of curriculum materials introduced to science teachers in the Western Cape
Sally Johnson, Zena Scholtz, Merle Hodges & Tommy Botha ..................... 146

Researching teacher development in the use of translation activities across Southern Africa
Sally Johnson ................................................................. 151

Gender attitudes towards the study of mathematics in Botswana junior secondary schools
Luckson M. Kaino ................................................................. 154

Evaluating a web-based package on human population issues for teachers
L. Kasalu, M. Doidge & M. Sanders ............................................. 160
A comparison of the use of everyday contexts by mathematics and science teachers in Namibian secondary schools  
Choshi D. Kasanda, Noah !Gaoseb & Fred Lubben

Science students’ biographical case studies  
Moyra Keane & Marissa Rollnick

Assessing the effect of an instructional intervention on the geometric understanding of learners in a South African primary school  
Lonnie C. C. King

Problems and challenges in promoting mixed ability teaching in Botswana  
A. T. Koosimile

Creating a holistic model for physical science teacher development: establishing a baseline  
Jeanne Kriek & Diane Grayson

A case study of an action-based environmental education course at one South African college of education  
X. S. Kyriacou & M. C. Doidge

Rudiger C. Laugksch

South African science teachers’ perceptions of the Nature Of Science (NOS): towards a framework for curriculum discussion  
Scott R. Linneman, Paddy Lynch, Rajah Kurup & Bongani Bantwini

The implemented curriculum: using science textbooks in Namibian classes: an investigation into the use of electronic networking by science and mathematics teachers in Zimbabwe  
A. Madzudzo, P. Masukume, A. Kurira, J. Shumbaimwe, E. Mushaikwa & C. C. Chitumwa

Observing classrooms: outcomes and opportunities to learn  
Cliff Malcolm & Lavine Kowlas
HIV, globalization and science curriculum in rural South Africa
Cliff Malcolm ........................................................................................................... 228

Explanations by chemistry teachers and in chemistry textbooks: their characteristics and students’ perceptions of their utility imagery: a tool for the generation, expression and recognition of students’ views about the world of molecules
Liliana Mammino .................................................................................................... 237

Explaining achievement at O-level physical science examinations: a cross-analysis of four schools in Lesotho
Tholang Z. Maqutu .................................................................................................... 243

Computers in education: a survey on student teachers’ beliefs, perceptions and attitudes
Tonderai D. Maswera & Chipo Tsvigu ..................................................................... 250

Teaching and learning word problems and mathematical constructions in Swaziland primary schools
Michael Mhlungu, Makhosazana Madondo & Clement Dlamini ............................. 254

Microscale equipment in Mpumalanga schools
Jan and Vuyiswa Mkhwanazi, Marissa Rollnick & John Bradley ............................ 260

Research involving ethnomathematics in a mathematics classroom
David Mogari ............................................................................................................. 265

A study of gender differences in learners’ self and peer reports of enjoyment, learning and participation in translation activity and non-translation activity lessons
Martin Monk & Olufunmilayo Amosun ..................................................................... 269

Mathematics teachers’ professional development in a South African context: a case study of the evolution of participants’ attitudes and classroom practices
Tulsi Morar ................................................................................................................. 274

History and cultural specificity of ethnomathematical activities in mathematics classrooms
Mogege Mosimege .................................................................................................... 279
Investigating some causes of the teaching and learning difficulties in chemistry as perceived by some A-level chemistry students and teachers in Zimbabwe: a preliminary study to a SEITT materials development programme
C. Moyo, T. T. Mukono, B. Mashayamombe & C. Njowa ............................................. 284

Teachers assisting teachers: to what extent can resource teachers in Zimbabwean schools mentor their peers?

Levels of acceptance of development and implementation of contextualized curriculum materials: a comparison between resource teachers and other teachers in Zimbabwe
T. T. Mukono, B. Mashayamombe, C. Njowa, & C. Moyo ........................................... 296

An investigation of the causes of poor performance in A-level chemistry practical work in Zimbabwe
T. T. Mukono, C. Njowa, C. Moyo & B. Mashayamombe ........................................... 301

The relationship between students’ concept images evoked and representations used in solving tasks: a case study
Balbina Mutemba .............................................................................................................. 306

Code switching revisited: the use of language in primary school science and mathematics classrooms
Nelisa Ncedo, Mary-Louise Peires & Tulsi Morar ......................................................... 308

Teacher support materials as a catalyst for science curriculum implementation in Namibia
Wout Ottevanger .............................................................................................................. 313

Impact of attaining “Further Diploma in Education” South African science education network project in improving content knowledge and attitude
D. Pandey ......................................................................................................................... 321

Some teacher factors likely to affect the implementation of curriculum 2005
Rajen Pillay & Martie Sanders .......................................................................................... 326

Researching youth sexual identity within the climate of HIV/AIDS pandemic
Shakila Reddy .................................................................................................................... 332
The influence of the initial aspects of a course on pedagogical content knowledge on a group of teachers and teacher educators
Mariam Rhemtula & Marissa Rollnick ................................................................. 335

The implementation of C2005 in Mpumalanga: towards a theory of implementation
J. M. Rogan, D. J. Grayson, J. van den Akker, T. Ndlalane, S. Dlamini & C. Aldous ......... 340

The science and technology of the home economics
F. Samkange & S. D. Gumbo ............................................................................. 350

Institutional relationship versus personal relationship of Mozambican mathematics teachers to inequalities
Luis San, Ribas Guambe, Ida Alvarinho & Torgeir Onstad ........................................... 358

The interpretation of biology textbook illustrations by grade 10 learners
Martie Sanders & Marethabile Khanyane ............................................................. 364

A cross-sectional survey of learners’ ideas about animals
Martie Sanders & Gerda du Preez ........................................................................... 370

Developing and testing a model of the factors affecting student interaction with scientific diagrams
Konrad J. Schonborn, Trevor R. Anderson & Diane J. Grayson ................................. 377

Why support science education for girls in developing countries?
Astrid Sinnes ........................................................................................................... 383

Assessing gender differences of A-level biology students’ perceptions of laboratory environments in Zimbabwean schools
Emmanuel Mark Zororo Tambo ........................................................................ 389

Triggering whole-class discussion in science classrooms: practical work, conversational texts and prompt posters
Paul Webb, Paddy Lynch, Derek Potgieter, Notozi Mgobozi, Des Cross, Raj Kurup, Pam Austin, Viv England and Scott Linneman ......................................................... 394

The contribution of the student voice in classroom research: a case study
Gaye Williams & David Clarke .................................................................................. 398