Some Developments in Research in Science and Mathematics in Sub-Saharan Africa: Access, Relevance, Learning, Curriculum Research

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# Contents

Foreword  
Öyvind Mikalsen and Cyril Julie  

Introduction  
Cyril Julie and Lorna Holtman  

**THEME: RESEARCH**  
1. Developing a Research Instrument for Learner-Centred Classroom Observations: A Namibian Experience  
   Hileni M. Kapenda, Ole E. Torkildsen, David Mtetwa and Cyril Julie  
2. Introducing New Content into a School Mathematics Curriculum: The Case of Cryptology  
   Kalvin Whittles, Ole-Einar Torkildsen, Cyril Julie and Trygve Breiteig  
3. Analysing Learners’ Written Work for Open Mathematical Tasks  
   Cyril Julie and Ole-Einar Torkildsen  

**THEME: ACCESS**  
4. Epistemological Obstacles in Understanding the Limit of a Sequence: A Case of Undergraduate Students at the National University of Lesotho  
   Eunice K. Moru, Jan Persens, Trygve Breiteig and Joyce Ndalichako  
5. Foundational Provisions in the UWC Science Faculty: Widening Access and Promoting Success  
   Lorna B. Holtman and Delia Marshall  
6. Prospective A-Level Mathematics Teachers’ Perspectives of the Concept of a Function  
   Maroni Runesu Nyikahadzoyi, Cyril Julie, David K.J. Mtetwa and Ole Einar Torkildsen  
7. Promoting the Learning of Mathematics: On the Use of Learning Styles in a Distance Education Calculus Course  
   Chipo Tsvigu, Trygve Breiteig, Jan Persens and Joyce Ndalichako
THEME: CURRICULUM, INSTRUCTION AND ASSESSMENT
8. Performance Assessment in Science: Some Experiences of Teachers and Students in Swaziland
   
   Victoria Kelly, Dirk Meerkotter, Lorna Holtman and Øyvind Mikalsen

9. Localising the Junior Secondary Science Curriculum in Lesotho: An Attempt at Integrating Technology and Science
   
   Lits’abako Ntoi, Lorna Holtman, Meshach Ogunniyi and Svein Sjøberg

10. Practice-Related Underachievement in Science Education: The Case of Malawi
    
    Emmanuel Dzama, Lorna Holtman, Stein Dankert Kolstø and Øyvind Mikalsen

11. The Rationale for Science Education, Curriculum Change and Reform in sub-Saharan Africa: The Case of Zimbabwe
    
    Elaosi Vhurumuku, Lorna Holtman, Øyvind Mikalsen and Stein Dankert Kolstø

    
    Neo Paul Liphoto, Stein Dankert Kolstø, Silas Oluka and Meshach B. Ogunniyi

13. Knowledge and Process Skills Used by South African and Norwegian Students to Perform Cognitive Tasks on Gases
    
    Øyvind Mikalsen and Meshach Ogunniyi

    
    Charles Opolot-Okurut, Cyril Julie, Øyvind Mikalsen and Silas Oluka

15. The Participation and Contribution of Teachers in Zimbabwe Towards Their Own Professional Development
    
    Peter Kwaira, Stein Dankert Kolstø, Dirk Meerkotter and Meshach Ogunniyi

THEME: RELEVANCE OF SCIENCE AND MATHEMATICS EDUCATION
16. What Kinds of Science and Technology Do Pupils in Ghanaian Junior Secondary Schools Want to Learn About?
    
    Ishmael K. Anderson, Sven Sjøberg and Øyvind Mikalsen

17. What are the interests of Zimbabwean secondary school children in school science?
    
    Francis Z. Mavhunga, Svein Sjøberg, Øyvind Mikalsen and Cyril Julie

18. The Relevance of School Mathematics Education (ROSME)
    
    Cyril Julie and Lorna Holtman
Foreword

This book comprises a collection of articles of some research directions in sub-Saharan Africa. The contributors were, at the time of writing, primarily doctoral students involved in a research capacity development project, the GRAduate Studies in Science, Mathematics and Technology Education (GRASSMATE) project. GRASSMATE was launched in 2002 and funded for a five-year period by the Norwegian development agency, NUFU. The precursor of GRASSMATE project was the Postgraduate Programme in Mathematics Education. This project is reflected upon by Julie, Mikalsen and Persens (2005). It was towards the completion of the last-mentioned project that a survey was conducted in universities in sub-Saharan countries to ascertain the needs and interests for a doctoral education in Science and Mathematics Education. Responses came from most of the invited institutions and interests in pursuing doctoral studies were expressed by more than 50 non-doctoral-holding lecturers at the solicited universities in the sub-Saharan region.

Following consultation with the host institutions, 27 prospective students from Zimbabwe, Uganda, Swaziland, South Africa, Namibia, Malawi and Lesotho were invited to a seminar at the University of the Western Cape. This seminar was followed by further sessions of discussions on the readiness of the invited students to engage in doctoral studies. The outcome of these deliberations led to the selection of 21 students to pursue doctoral studies in Science, Mathematics and Technology Education. A further student, involved in Nursing Education, was selected to enter for a Master's degree with the intention to continue immediately with doctoral studies after the successful completion of the Master's degree. There was an equal split of female and male students.

Supervisors from universities in Norway, South Africa, Tanzania, Uganda and Zimbabwe guided the students and formed the backbone of the academic staff of the project. The project, being North–South and South–South collaboration, was anchored in Norway at the University of Bergen. Four professors and two associate professors from four higher education institutions in Norway (University of Bergen, University of Oslo, University of Agder and the University College of Volda) participated as supervisors. The anchoring institution in the South was the University of the Western Cape. Five professors and three senior lecturers from higher education institutions (University of
the Western Cape, University of Zimbabwe, University of Dar-es-Salaam and Makerere University) comprised the supervisory team members from sub-Saharan Africa.

As already mentioned, the project was primarily funded by the Norwegian development agency, NUFU. Additional funding was also received from the University of Bergen, and the University of the Western Cape provided infrastructural and other operational support.

The majority of the chapters in this book were primarily written by students. The supervisors supported them through commenting on drafts and sharpening their writing. The chapters were written when the project was about mid-way through the funding period of GRASSMATE and they deal with the research projects the students were pursuing.

Reference

Øyvind Mikalsen and Cyril Julie
Introduction

The different chapters in this collection should be read around the notions of access, adoption, adaptation and localisation.

Currently much attention in late developing countries is accorded to the provision of access to studies which will allow the pool of young people graduating from schools to enter science- and technology-related careers. This is driven by the belief that more school graduates entering these fields would substantially contribute towards the developmental needs of these countries. But access into institutions of higher learning only provides institutional access. A concern is that such students normally come from schooling environments suffering from a lack of resources – human, physical and financial. There is thus a need to provide such students with epistemological access to the disciplines of import to improve their chances of success. Some of the chapters deal with research related to epistemological access.

Research in any discipline does not occur in a vacuum. For any research endeavour there are antecedent studies on the topic of interest. A feature of studies of research in Science, Mathematics and Technology Education is that it is highly localised in terms of its empirical bases. This implies that although results have the potential to be generalised to a larger population of interest, it is problematic to universalise such generalisations. In environments where research productivity is low, it is not uncommon to find that there is either adoption, adaptation or localisation or some combination of these constructs of the problems being investigated, of the methods employed to address research problems, and the theoretical frameworks used in the research process. The value of such replication or quasi-replication studies is that they contribute towards knowledge production in the sense that they might provide more cases towards the universalisation of research results or provide a case which refutes assumed universality. As is evident, the three constructs are difficult to separate, but in reading the chapters it is possible to find the pivoting one which guides the chapter.

This introduction purposefully doesn't characterise the specific chapters under the four guiding constructs of the book. This is done so as to allow readers to use their own insight to decide the goodness-of-fit to the offered constructs. The book is divided into four sections or themes namely: Research; Access; Curriculum, Instruction and
Assessment and Relevance. The ideas of access, adoption, adaptation and localisation come through in these themes.

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