

SCIENCE, TECHNOLOGY AND ENVIRONMENT: INTERCHANGE WORKSHOPS AMONGST MASTER OF EDUCATION STUDENTS, UNIVERSITY OF DURBAN-WESTVILLE AND RHODES UNIVERSITY

Rob O'Donoghue

The workshop interchange reported here were funded with a grant from the Foundation for Research Development (FRD). Two workshops were convened by the Master of Education students of the interacting universities. The theme of science, technology and environment was introduced as a cluster of priorities that has often been treated as three discrete learning areas in the curriculum debate. The three concerns are, however, inseparable and intermeshed in the development challenges and environmental risks of everyday community life in South Africa.

The first workshop was held at Durban-Westville as a pre-conference day within the EEASA annual conference of 1995. This enabled wider participation on the focus theme of 'environmental and science education' and opened discussions on how the three developing concerns emerged as differing disciplines, environmental education, science education and technology education, amongst specialist curriculum development initiatives.

After introductory remarks on the interchange theme by Rob O'Donoghue (Natal Parks Board), Prem Naidoo (UDW) outlined a history of science education and a developing concern for science, technology, society (STS) with a strong environmental problem-solving flavour. A plenary discussion then raised key issues for the proposed workshop discussion groups. Focus topics examined were culture and indigenous knowledge, constructivist theories of learning, classroom realities, research proposals and making sense of post modernism. Participants concluded the day with a report back outlining joint writing projects to further explore these topics and they proposed issues to be carried forward to the second workshop at Rhodes. The focus theme for this was educational research.

The second workshop was held at Rhodes in August, 1995. Eureka Janse van Rensburg opened with a paper on paradigms and other frameworks to give historical and conceptual focus to develop the workshop theme of educational research. This concern was particularly relevant as all of the

participating students were constructing proposals for, or were working on / concluding, research projects as the final hurdle in their Masters degree courses. The workshop developed as a process of reporting on their research and the presenting of summaries on issues from the first workshop. The latter were tabled for inclusion in the proceedings of the interchange. The workshop was concluded with individuals and groups electing to undertake further writing tasks for the proceedings and for a proposed EEASA Journal on science, technology and environment.

All submissions for the proceedings were received by early 1996 and a record of the workshops was circulated to participants. Thesis pressures thinned the field of intended journal articles but four draft papers were received. With insufficient material for a journal it was decided to conclude the interchange with this report and to include summaries of the draft papers and research topics being undertaken by student participants. More fully developed papers were invited for submission to the *SAJEE* and *Bulletin* in 1997.

By outlining current research topics and developing papers in this journal it is hoped that researchers with similar interests will be able to interact and that EEASA members will get a sense of what happened at the interchange workshops. The goal of fostering wider professional interaction amongst students and of stimulating discourse on pressing issues in science, technology and environment education was to some extent achieved. Honest critical interaction on course design, research experiences and comparative university facilities was an added richness within the interchange. The conveners are grateful to the FRD and EEASA for supporting and encouraging this interchange. We hope that there will be continued development of interchange workshop opportunities amongst an emerging cohort of South African researchers with great things to contribute in the reshaping of sedimented orientations that often have us falling short of a clear grasp of the developing challenges within which we are intermeshed.

Summary of submissions by participating researchers

The relationship between the present pre-service science primary course at Ezakheni College of Education and the teaching of general science at a primary school. Thabani Msweli, UDW.

This survey sets out to describe and to illuminate the experience of newly qualified teachers in the school system where one often finds that science teachers do not get to teach their favoured subject and yet there are calls for a rectifying of a shortage of trained science teachers. Semi-structured interviews were conducted to clarify some of these issues and problems amidst subject boundaries and a trend towards STS where these diminish. Problems experienced by newly qualified teachers are examined as the joys and disappointments of science teaching in schools and questions are posed as to the appropriateness of current college programmes.

The role of culture in understanding science concepts. Farida Patel, UDW.

Questionnaires and interviews with pupils and their teachers are used to penetrate cultural tensions in standard seven science classrooms. After pilot testing the research instruments were broadened and refined to examine 'conflicts that arise' where 'prior knowledge and beliefs' are challenged in science lessons. Particular attention is then given to teacher sensitivity to and interpretation of these concerns, and also to their strategies for enhancing classroom learning.

Case studies of selected physical science classrooms and training schools with a view to clearer insights of the current state of Primary Science at the operational level. Abel Kannieappan, Logis Pillai and Allen Moodley, UDW.

This study sought to examine the current state of physical science teaching in a range of classrooms. The case studies seek to examine tensions amidst policy development in science and technology and some of the facilities and classroom realities experienced by teachers. The goal of the research was to try to gain insight into what factors may contribute to low and high performance over a diverse range of schools within changes to a unitary education system.

Participatory curriculum development: The case of science curriculum initiatives undertaken at the Durban Teachers' Centre (DTC). Derek Govender, UDW.

A policy shift to teacher participation in the shaping of the new curriculum is examined in the historical context of developing education department practices and developing strategies to involve teachers in shaping change.

Action research as a means of introducing an innovation like cooperative learning. Rehana Schreuder, UDW.

Three cycles of action research, with developing reconnaissance amongst observations, diaries, tape recordings of interactions and solicited reflections (for example) are used to penetrate a setting of cooperative learning. This experience generated mountains of data that are interpreted in continuing work and are used to reflect on the developing innovation.

An evaluation of a primary science inservice correspondence course. Sharma Bhikha, UDW.

Close attention is given to use of study guides by students involved in a science in-service course. Questionnaires, interview schedules and observations are used to penetrate the impact of the course on teacher professional development and classroom practice. Many of the practical problems teachers experienced on the course are documented.

Teacher understanding of and participation in the development of programmes at EE centres. Charmaine Klein, RU.

A collaborative, action research project involving teachers and the EE Centre at UWC, to improve existing programmes or develop new ones through teacher participation, and at the same time, to develop a better shared understanding of EE. The study led to teachers taking action by presenting a workshop in which they attempted to involve other teachers from the schools.

Facilitating reflective practice in the science curriculum: Towards education for environmental literacy in Lesotho. Tsepo Mokuku, RU.

Mokuku selected five Junior Science teachers in five secondary schools Maseru in order to:

1. Clarify the meaning of environmental literacy in the context of Lesotho in collaboration with the selected teachers (the research team),
2. Explore how Junior Science may be taught in accordance with the emerging meaning of environmental literacy in the context of Lesotho, as interpreted by the research team.

Phelane Lebuso and Mamohau Mapesela introduced a small action research project in their science classrooms.

Student-teachers' conceptualisations of 'significant' animals. Neil Murtough, RU.

This study uses a socio-constructionist perspective to understand the scientific and other cultural conceptions of animals held by a group of Tswana-speaking student teachers. Many constructivist notions are challenged in the quest to develop appropriate teaching methodologies for EE in multi-cultural science classrooms.

Contact addresses of participants and copies of the proceedings can be obtained from Rob O'Donoghue, Natal Parks Board, P. O. Box 662, Pietermaritzburg 3200 or from the convening universities.

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Aims of EEASA

- * To act as a responsible body for the purpose of consultation and coordination on matters of public and professional interest concerning environmental education in southern Africa.
- * To promote interdisciplinary as well as multidisciplinary environmental education.
- * To promote, organise and support activities associated with and research in environmental education.
- * To provide opportunities for the exchange of ideas and opinions *inter alia* by means of the publication of a journal.

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