

Report on organizing the ROSE survey in Zimbabwe

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1. ROSE team

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The Zimbabwe Rose survey was done by Francis Mavhunga in 2003 while based at Bindura University of Science Education in Zimbabwe. The involvement with the Rose project started at the stage of formulation of the Rose questionnaire. Comments on questionnaire items were submitted to the process of formulating the Rose questionnaire. The survey was supported by the Rose project in Norway. Much of the data collection was possible through contact that existed with schools through Teaching practice supervision, University outreach and previous research links. The Rose data is being used by the participant for a PhD.

2. School system and science teaching

Zimbabwe has a 13 year school system between the ages of 6 and 18. All levels of primary and secondary school education are examined by the Zimbabwe School Examinations Council. Historically secondary education was examined from Britain, (Cambridge University Local Examinations Syndicate) but in recent years, all such examinations and matters of curriculum development are fully localized.

a) Primary school (6-12yrs)

Primary school is seven years long and is examined by the Zimbabwe School Examinations Council. Science education at this stage is presented as study of environmental concepts. The curriculum emphasizes development of an awareness of the environment of the child. Concepts of Life science, physical processes, basic scientific skills and content are introduced to the learners. Primary education is compulsory.

b) Secondary school

The six year secondary school education is made up of three levels.

Form 1 and 2 (13-14) make up the Junior Secondary School. This level is examined by a public examination, the Zimbabwe Junior Certificate. An average of ten subjects is studied in the two years, to introduce the learner to a wide range of academic and practical disciplines.

Form 3 and 4 (15-16yrs) makes the middle secondary school. Science education exists in a number of syllabuses ranging from pure sciences, combined science to integrated science. This stage leads to Zimbabwe General Certificate of Education (Ordinary level). Specialization of study into either Sciences or Arts effectively starts and is based on the performance of learners in Ordinary level. Only about 20% of school leavers at this stage can be absorbed into existing Advanced level schools.

Form 5 and 6 (17-18). Advanced level is a highly competitive pre-university level. High passes at O-level are necessary and learners specialize in at least three Arts or Science subjects and General English for communication skills development.

3. Translation

Zimbabwean learners use English as medium of study and there was no need to translate the questionnaire into the local languages. Most respondents asked questions about concepts and phenomena they were not entirely familiar with such as cloning.

4. National questions

Zimbabwean schools have peculiarities that come from the colonial history of separate development for people of different races. Thus, former white schools have continued to have higher budgets, wider curricula and serve the more wealthy levels of society. Choices of activities and subjects in these schools differ from the rest of the mainstream government aided urban and rural schools. Mission boarding schools also have academic cultures and funding levels of their own.

In the wealthy schools, English is used more than the local languages. African families that have become acculturated into white communities because of their wealth speak English more commonly than their vernacular. Shona and Ndebele are the two main local languages (practically semi-official) and spoken in different regions of the country. For these reasons, national questions have been added at the head of the questionnaire to obtain information about:

- The language commonly spoken in the school and homes of the pupils
- The type of school, to reflect the level of society and hence subculture from which the children come from.
- Geographical Region in which school is situated

No changes were made to the actual items of the questionnaire.

5. Piloting

The Rose questionnaire was considered as complete and was not piloted further in Swaziland for question consistency and validity. The only piloting was of ten questionnaires given to pupils of one school to establish generally how long pupils in Zimbabwe would take answering the questionnaire. This was meant to guide the data collection process as to how much time would be required of the selected classes.

6. Official permission

Permission to enter the schools for the administration of the questionnaire was obtained from the Ministry of Education in Harare. Through the involvement of the researcher with many of the schools in previous data collection, supervision of student teachers and Physics Education outreach programs, access to the schools was easy.

7. Population

The Rose questionnaire targets 15 year olds. In Zimbabwe the ages of children in the penultimate year of secondary school is quite variable. Therefore it was considered that the academic level of the third year in secondary school would be the target. A run through the age frequencies shows a spread from as low as 14 to 20 years with a mean around 16. A total of 735 respondents participated which is above the statistically sound optimum of 650.

8. Sample and participation

Zimbabwe has an estimated 12million people and the sample was taken from a cross section of the types of schools, regions of the country and location of the schools. Regions of different economic activities such as farming, mining, rural, urban high-density and urban low-density areas were sampled to capture views from a wider section of the Zimbabwean community.

Schools were also sampled to reflect the different types of funding that schools live on. The majority of the population attends government aided. These receive grants from the Ministry of Education and use school fees paid to them as part of the running costs of the school. Teachers' salaries are however paid by the government. High fee paying schools are totally independent of government and they pay their own teachers. Such schools usually attract only the affluent.

Boarding schools run by churches (mission schools) are generally managed by the churches and boards of parents and teachers but they receive government aid in the form of teachers' salaries. These demand higher fees than government day schools and are normally serving the middle class.

The higher fee paying schools have generally low enrollments, average class sizes of 30 to 40 and usually can attract well trained and experienced teachers. Science laboratories in these schools are also much better resourced than government urban and rural schools.

9. Data collection in schools

Due to peculiar economic conditions in Zimbabwe, printing the questionnaire was prohibitively expensive. In order to contain the high costs, only about 100 questionnaires were photocopied. A special answer grid was designed on three pages. The 100 questionnaires were not to be marked and were retrieved from every class. While this limited the speed at which schools could get to answer the questionnaires, it kept the cost low. The overall cost for the whole exercise did not exceed US\$700.

Travel to sample schools over distances such as far apart as 600km was particularly challenging with an unreliable fuel situation. Transport to schools was either through hitch hiking or when possible combining questionnaire administration with other functions such as student teacher supervision or outreach programs to physics teachers in schools.

A colleague, Caleb Moyo, helped administer the questionnaires in the western half of the country (Bulawayo) and transfer of material was done through surface courier. This kept costs low.

10. Feedback and experiences

Pupils responded to the questionnaire with general ease. An average of 40 minutes was used to answer the whole questionnaire. In rural schools however, up to an hour was necessary to answer all the questions. Queries were raised by pupils where they did not understand some concepts such as the questions on black holes, cloning and solariums. These are generally not covered in their science lessons and hence were relatively new to them. It was interesting however to note that there was always one or two pupils who had very good ideas what these new terms referred to. This was mainly found in high fee paying schools and middle class schools. These pupils had learnt of these concepts either from siblings, satellite TV, magazines or the internet. These facilities are found in their homes more than the schools.

11. Coding (also of the open-ended I question)

The coding outline laid out in the Rose Handbook was used. Responses to item I were entered using the same coding instructions from the handbook. Very coherent responses were made by pupils in urban and high fee paying schools. However, rural, farming and mining area pupils seemed to have difficulty in articulating coherent answers due to weak command of English language. Often the statements in Item I attracted multiple answers. To maintain consistency in the coding, only the first submission made was considered. Where an answer was nonsense or incoherent this was considered as not having been answered.

Francis Mavhunga. November 2004.