TEACHER EDUCATION IN AFRICA: WHY THE MATHEMATICS AND SCIENCE TEACHER EXTENSION PROGRAMME WORKS IN NAMIBIA

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INTRODUCTION

In the majority of African countries on attainment of political independence after decades of colonialism found themselves with few (if any) adequately educated and prepared persons to carry on the task of developing their new state economically. Namibia was no exception. Indeed at independence in 1990, Namibia found herself in the same position as other African countries, with a poorly trained or untrained cadre of schoolteachers in almost all subject areas. The building of more schools and the training of more schoolteachers for the majority of the previously colonized people was a must for these African countries. The general population saw education as a passport for a better life and their right. Therefore teacher education had to be emphasized to cope with the increased demand for education. Accordingly, teacher education was one of the priority areas of these independent countries in order to develop the necessary human resources and to develop economically. Education brought about a higher personal status and quality of life. Therefore,

CURRENT TEACHER EDUCATION PRACTICES IN SADC COUNTRIES

Currently, there are two main types of initial teacher training practices in African countries. One of these is the training of teachers especially for the primary and junior secondary schools at Teachers' Colleges. The other is the preparation of senior secondary school teachers at Universities. Indeed, in some countries such as Botswana, and Swaziland among others primary school teachers are also trained at the University.

One type of teacher training at the universities requires potential teachers to complete their initial degree, in this case the Bachelor of Science and then return for another year or so for a Post Graduate Diploma in Education emphasizing educational courses that gives them the right to practice as qualified teachers in the schools. The other type is the integrated mode in which the student teachers study both content and professional courses at the same time. In this situation the graduate is regarded as a fully trained and trained teacher.
As indicated earlier, teacher preparation may take place at the Teachers' Colleges or University. In some countries such as Namibia, the Teachers' Colleges are autonomous. In such a situation, the Colleges set their own curricula and examination standards without outside help. Token help may be sought from the university personnel on an individual basis.

In other countries such as Zambia, Zimbabwe, Swaziland and Botswana the Colleges and the University have entered in an Associateship relationship to oversee and maintain standards in the Colleges. The University has in most cases a determining say in the curriculum and standard of examinations set. In the countries cited above practice this relationship between the university and Teacher Training Colleges, university lecturers are also involved in supervising teaching practice to ensure the Colleges are really keeping the standards.

In both the first and second scenario, advantages and indeed disadvantages (problems) exist. It is a matter of each country practicing a particular mode of teacher training to have hopefully weighed these prior to adopting a particular one. Especially at universities, the student teachers are often expected and required to take content courses from their Faculties, while the Faculty of Education offers the professional subjects. In the case of science and mathematics teachers, their content courses often come from the Faculty of Science. And often the science and mathematics teachers take similar courses to those being taken by students who are pursuing a straight Bachelor of Science degree. At the end of either the third or fourth year of study, these students often go on teaching practice, and may be evaluated by either their university or college lecturers or host teachers or a combination of both their lecturers and host teachers who are in most cases senior teachers within the school. This exercise gives them a taste of the classroom reality for a few weeks or a complete semester. In most cases the school teaching practice is not a learning time. Many students are concerned with obtaining a passing mark than learning their future roles as teachers.
It should be noted that there are several aspects that need to be taught to trainee teachers during their initial teacher preparation programme. As a result the initial training programme seems to be a choice of what content is really necessary because there isn’t time to cover everything. One may even be bold enough to say that these teachers experience reality shock when they finally start teaching. Accordingly, it is not easy to find best practices at the pre-service teacher training levels. These are usually found at the second level of in-service programmes (INSET). This is due to the fact that the in-service programme content and activities could be tailor made to produce a particular kind of teacher.

MASTEP PROGRAMME IN NAMIBIA: BEST PRACTICE INNOVATION IN TEACHER TRAINING

The paucity of well-trained teachers is more acutely felt in the areas of mathematics and science education especially at the higher secondary school level in almost all countries in Africa and the outside world (Haambokoma, 2003; Pabale and Dekkers, 2003; Benson, 1994). Benson (1994) noted, “A high percentage of Science and Maths teachers (in South Africa) are under-qualified, and are themselves the product of a disadvantaged education system”. In Namibia the lack of adequately trained mathematics and science teachers has often been attributed to the fact that many schools in the black communities did not offer these subjects at all. This was as a result of the Bantu education system that existed in the country prior to independence. The South Africa colonial power believed that mathematics and science subjects were irrelevant to the needs of the African child. Ramananandan (1995:139) quotes Jardine (1993) who quoted Prime Minister Verwoerd’s speech of 1945 thus; “What is the use of teaching a Bantu child mathematics (and science) when it cannot use it in practice?...Education must train and teach people in accordance with their opportunities in life...” Such an official view in place had adverse effects on the learning of mathematics both in South Africa and Namibia.

At independence the Namibian Government recognized the vicious circle operating in the schools. That is the presence of poorly trained or untrained mathematics and science teachers produced the same kind of learners who failed to continue with the studying of
mathematics and science courses at tertiary level, hence producing fewer candidates to train as teachers and hence continuing the circle again. It is this set of factors that acted as the catalyst in trying to find ways of and breaking this circle.

The current Mathematics and Science Teachers Extension Programme (MASTEP) is the upshot of the initially envisaged Namibian Mathematics and Science Education Programme (NAMSEP) mooted early in 1990. Nonetheless MASTEP became a reality in 1999 with joint funding from the Namibian Government and the European Community. The MASTEP programme is a two years part-time teacher in-service programme. The main goals are to; improve mathematics and science education in Namibia at the junior and senior secondary levels; upgrading initially about 360 serving teachers to teach biology, mathematics or physical science to the International General Certificate of Secondary Education level (IGCSE) and lastly enhance cooperation among UNAM Faculties and Colleges of Education in the country, at the end of the four years of the EU's funding. In addition to the three subjects, lack of proficiency in English among the schoolteachers was recognized as a possible hindrance to effective teaching. Accordingly, Communicative English was made an essential component of the MASTEP programme. Each MASTEP teacher was required to specialize in one subject only. A further diploma was awarded to the successful candidates.

During its duration, the MASTEP programme's effectiveness, was measured against the stated main goals at the midterm and end of programme points (Francis and Burger, 2003; Leyendecker, 2002). Both evaluations regarded the MASTEP programme as a promising practice in the preparation of mathematics and science teachers.

FEATURES THAT MAKE THE MASTEP EFFECTIVE IN THE PREPARATION OF TEACHERS
The success of the MASTEP programme has been attributed to a variety of features, chief being its careful planning. Some of these features include:

**Clear goals and objectives**
At its inception the aims and objectives that were to be achieved and how they were to be achieved were clearly stated. Indeed, the programme’s curriculum comprised content to account for 66% of the study time; 22% for the professional and s and 12% for the Communication and Study Skill content. This division of study time helped in focusing the conduct of the programme during its implementation. Indeed the use of a logical frame in both the planning phase and the formative evaluation of the programme helped in keeping of the objectives in mind.

The MASTEP programme comprised of a distance component of 46 weeks duration and a compulsory total of six weeks residential component in each of the two years. The residential school is carefully planned so as to cause as little disruption of the school system as possible. Indeed, the MASTEP teachers attend the residential school either a week before or after the opening of each school term.

**Careful organization of the programme**
The appointment of a project manager responsible for the day to day running of the programme assisted by a projector coordinator and two deputy project coordinators were instrumental in ensuring that programme activities were reviewed constantly and corrective measures implemented as soon as was feasible. Indeed the project manager had to be on top of all activities to ensure the project’s success. Since the MASTEP programme brought together the Faculty of Education, the Faculty of Science, the Language Centre and the Centre for External Studies at the University of Namibia on one hand and the Ministry of Basic Education and Culture on the other, the project manager had to maintain good relationships with all stakeholders and inform each one of them of the activities to take place. Further, frequently and timely reports of what objectives had been achieved during a given period were crucial to the achieving of the objectives.
Teaching and learning materials

The MASTEP programme’s materials were prepared during writing sessions by lecturers from both the Teachers’ Colleges and University staff. These carefully prepared materials were “tailor made distance education materials and manuals” for use by the MASTEP students and lecturers (Francis and Burger, 2003). According to Francis and Burger (2003) the materials “are clear, practical and interestingly written” (p. 16). Indeed, many of the writers became involved in the programme in one-way or the other including the teaching and/or facilitating the programme. The materials were made available to all the students when they reported for the initial two weeks face-to-face period (the programme has 6 weeks of face to face teaching) of this distance programme. During this period the students undergo intensive content and methods instruction. Indeed, the availability of textbooks and other materials has made the preparation of these teachers easier than would be the case with these materials.

Teaching staff

The teaching staff in the MASTEP programme includes both the successful practicing teachers in secondary schools, the Ministry of Basic Education, Sport and Culture and the University of Namibia lecturers. These have been found to be motivated and committed. Nonetheless, some financial remuneration is given to them for the work being done, which includes teaching, setting assignments and marking these. In their presentation of the methodological component, learner-centred teaching is emphasized so that these teachers would use the method upon graduation.

Host teacher support

The MASTEP teachers are supported by the materials to enable them complete their assignments in time and in the schools by trained host teachers. These are often more experienced teachers in the schools who are assigned the task of overseeing the MASTEP teachers during the time they are back in the schools. As Benson (1994) noted lack of professional support for teachers may produce in them a sense of isolation and “powerlessness to solve some of the problems they face at school on their own”. Accordingly, the support provided by the host teachers in the MASTEP programme gave
these teachers the assurance that they were not alone and that help was always available to them.

**Professional Development Placement (PDP)**

The PDP is four weeks (two separate weeks) long and the MASTEP teacher observes and teaches in a senior secondary school, often away from their actual school, which might be an upper primary school or combined school. The PDP is different from the usual school teaching practice often required of pre-service teachers. Under the watchful eye of the host teachers the MASTEP teacher takes over and teaches an IGCSE class in the subject in which they are being prepared. An evaluation of the PDP experience (van der Zwan, 2003: 84) found that the PDP made a positive difference to the experiences of the MASTEP teachers.

**Sustainability of the programme**

The use of local expertise in the teaching of the MASTEP programme and the UNAM’s continuing to offer the programme after the EU period of funding is an important aspect that makes the programme a worthwhile one in that it will hopefully continue to trainee mathematics and science teachers who will make a difference in our schools aimed with appropriate subject content.

Further in the four years of its duration, the MASTEP programme has been successful in graduating mathematics (73), biology (66) and physical science (85) teachers able to teach at the senior secondary school level, hence helping greatly in the development of dearly needed and adequately trained workforce for the Namibian classroom.

**CONCLUSION**

The MASTEP programme is a promising best practice for a number of reasons some of which have been described above. Indeed, the impression one gets is that the clear goals, better management, dedicated staff and an abundant supply of materials and support given to the MASTEP teachers in the field were responsible for the success of the programme in achieving its stated goals and objectives to a greater extent.
The MASTEP programme has similar features as the Centre for the Advancement of Science and Mathematics Education (CASME) in South Africa that helps mathematics and science teachers through a supportive environment.

REFERENCES


