

Introduction

An important aspect of science education reform in the world today is the implementation of science and technology education. Technology bridges science and society, brings relevance to science teaching, and unifies different subjects. It provides approaches to problem solving, relates different subjects to life and helps to link theory and practice. The science teacher educators in many developing countries are finding it difficult to prepare science teachers for this kind of science education. They recommended in a Commonwealth Secretariat meeting that monographs be developed which could guide science teacher educators in their attempt to prepare science teachers for science and technology education. These monographs have been developed to meet that felt need of science and technology teacher educators.

Science graduate programmes in the Universities have long been organised in terms of separate subjects namely botany, chemistry, physics, zoology etc. Consequently the scope of science knowledge of most science teacher educators is limited – they are familiar with one or two science subjects. However science and technology education usually involves inter-subject teaching. This requires teacher educators to have a broad base of science knowledge. In Monograph 1 ‘Training needs of science and technology educators’, it has therefore been highlighted that while recruiting teacher educators, candidates with broad-base knowledge of science subjects be preferred. Selected candidates and existing teacher educators who lack breadth in their science knowledge be provided opportunities to acquire the perceived deficiencies through in-service courses or attachments with science departments in universities/colleges.

It has also been recognised that most science teacher have tended to stress science while neglecting technology in their classes because of lack of training in linking technology with science. The priority task is therefore to improve the pedagogical skills of science teacher educators themselves such that they could relate science and technology using examples of local technology. This also requires that teacher educators will be able to help teacher trainees to think in many different ways, including the selection of methods and the use of different materials and tools. Science teacher educators must provide this kind of experience to the teacher trainees during the courses they conduct for science teachers. In Monograph 2 ‘Teaching practice for science and technology’, a four-tier approach to the training of science teachers has been suggested whereby the science teacher educator first explains the theory underlying a methodology then demonstrates the use of a pedagogy followed up with practice by the prospective teachers and finally the follow up in the actual classroom. Considerable emphasis has therefore been laid on practice teaching and its supervision.

Effective science and technology education requires the use of variety of resources. Lack of availability of material resources specially the science equipment has been regarded as an impediment in providing quality science and technology education. Many science

teacher educators fail to recognise the use of locally available and improvised materials as an opportunity to provide relevant and life related science and technology education. The reason for this cynicism partly lies in the lack of their ability to identify, use and improvise suitable locally available materials. Monograph 3 'Resources in science and technology education', has therefore been written to help teacher educators' first in the identification and use of locally available material and how they can go about improvising such materials in their own teaching. Secondly, it helps them to provide guidelines to teacher trainees in the use of such resources.

An important feature of the monographs is that they not only provide guidelines to the teacher educators to improve their own teaching but also provide strategies which could be used by them with their trainees to make them better science and technology teachers. Another common thread throughout the monographs is the emphasis on the regular use of those methods, materials and approaches by the teacher educators in their own teaching which they expect teachers to use. It is based on the understanding that when the trainees observe a skill in action, and get the opportunity to practice that after observation, the chances of transfer of skill improve.

Science teacher educators require tools and techniques to assess teacher trainees both at the formative and summative levels. They also have to provide training to the prospective teachers in evaluation to enable them to evaluate their students. Monograph 4, 'Evaluation', precisely does this by discussing purposes, uses and techniques of different kinds of evaluation.

To improve the training of science and technology teachers in the teacher training institutions, and the delivery of science and technology education in schools requires coordination at all levels and professional development of all concerned. Monograph 5, 'Professional development of science and technology teacher educators', discusses the important interactive relationships within and across teacher training institutions, schools and external institutions and provides guidelines on achieving coordination for professional development. Monograph 6, 'Participating in science and technology education research', has been written to stimulate action research amongst teacher educators and demonstrates how they could generate such research among teachers.

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