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September 1999

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Recommended Citation

Pardhan, H., & Wheeler, A. E. (1999). The Nairobi model: A focus on primary science classroom practice. *Science Education International*, 10(3), 31-33.

Science Teacher Education

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This section focuses on the education of science teachers, and aims to communicate ideas and strategies which will assist science teacher educators to enhance and enrich their programs.

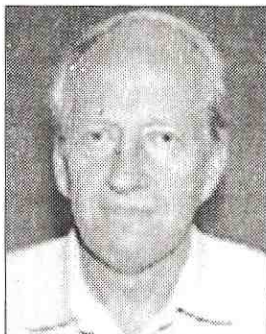
The Nairobi Model: a focus on primary science classroom practice

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"This (school based approach) complements the other advantage which comes with school-based teacher education: the opportunity to take stock of a learner-teacher's needs, and, over an extended period, to cater for these needs, to monitor the ways they develop, and to respond to these developments."

(1)

Background

The December 1998 issue of *SEI* (2) described efforts at the Aga Khan University - Institute for Educational Development (IED) to enhance science teachers' pedagogical content knowledge through a specially designed year long, part-time specialist programme whereby candidates translated acquired

skills into classroom practice in the context of their own schools. Based on this successful venture, the Subject Specialist Teacher (SST) Programme, has now been approved for extension to include other subject areas, and more importantly, has heavily influenced other regular programmes offered by IED. This paper describes a pilot school-based programme for the reprofessionalisation of primary science teachers in Nairobi, Kenya conducted during the August to December 1998 period, referred to here as the "Nairobi Model", which is a direct outgrowth of the SST Programme. It is seen to contain distinct advantages to impact more directly upon professional practice in the context in which it really matters - the regional classrooms of the candidates themselves. Salient features of the school-based Nairobi Model

are outlined together with a discussion of the merits of the Model for broader adoption for inservice teacher education.

The Visiting Teacher (VT) Programme

The main thrust at the IED has been the re-professionalisation of practising teachers in Pakistan and the region the Aga Khan University serves. Central to this professional development process has been the series of two-month, full-time courses offered under the rubric of the Visiting Teacher (VT) Programme which began in late 1995. By the end of 1999 nearly twelve hundred VTs will have graduated from the VT programme in one of five areas (Mathematics, Science, English, Social Studies, and Primary Education). A distinguishing feature of the VT Programme is that the instruction is largely carried out by IED's own M.Ed. graduates who are termed, Professional Development Teachers (PDTs), drawn from several countries in the region (i.e. Tanzania, Uganda, Kenya, Bangladesh, Tajikistan, Kryzstan) and from throughout Pakistan itself.

The VT Programme has evolved considerably over the years in response to various professional needs expressed by stakeholders in IED's cooperating schools. The Programme has been shown to be both resilient across a wide range of schools, both Private and Public, and able to accommodate to the differing contextual needs of the regions. The Nairobi Model represents the latest version of this evolving process and consists of the basic structure shown below.

"Nairobi Model"

In Component One (3 weeks), candidates were encouraged to reflect upon their current classroom practice and reconceptualise their beliefs about the teaching and learning of science, in light of contemporary theories. Ample opportunity was given to share their ideas and experiences. The overall focus of Component One was the enhancement of both pedagogical and content knowledge, which was largely achieved through a structured series of science activities emphasizing the basic processes of science and recognizing the importance of the student's prior knowledge in the understanding of the concepts and principles involved.

"The long awaited Second Module commences. I am composed and find myself 'fit as a fiddle' and ready to implement what I learned in the first Module."

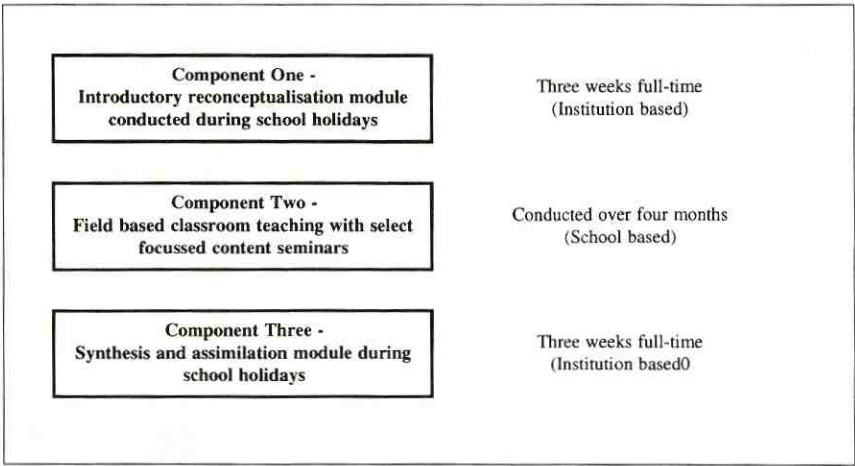
VT Candidate

The emphasis in Component Two was on the effectiveness of the candidates' ongoing classroom practice and reflects the central pillar of the Nairobi Model. Candidates were encouraged to try out specific strategies introduced in Component One over several months in their own classrooms. During this School-Based Component, faculty and PDTs held regular observational and reflective sessions with the VTs in the context of normal school routines and unexpected disruptions (e.g. a nation wide teacher strike).

"I have learnt more about the practical aspects of implementing the teaching strategies and process skills through teaching and/or observing VTs or other PDTs conducting sessions. This is especially true for cooperative learning and the investigative approach."

PDT's reflection

Regular seminars were held during the School Based Component to address selected content topics and to provide feedback and support regardless of the candidate's home



context. Special arrangements were made to accommodate candidates who resided outside Nairobi (i.e. Dar-es-Salaam and Mombasa). During this period, VTs had to develop and implement a science curriculum unit plan consistent with the skills acquired in Component One. Observational school visits were then carried out by the facilitators in accordance with the candidates' normal teaching responsibilities and the Unit Assignment.

Component Three attempted to bring together all the experiences and learning acquired over the field-based component. Candidates initially shared their successes and challenges faced in the implementation stage, which served as a basis for the overall synthesis of the programme. This synthesis process was useful in identifying further needs and areas of attention in order to continue to foster professional growth.

Summary

Overall the Nairobi Model was seen to hold distinct advantages to meet both the pedagogical and content needs of the classroom practitioners. Chief among these advantages was the manner in which the initiative was contextualised across the diversity of classrooms and backgrounds of the teachers. The extended opportunity to bridge the theory into

practice dimension over a realistic time was also a major strength. A further positive feature had to do with the increased interaction and collaboration between the schools and the institutional team.

The heavy emphasis placed on classroom practice and the increased presence of facilitators in the respective schools highlighted other school improvement aspects. For example, other teachers became motivated to try out similar strategies with their own students as a result of the attention the programme received in the school.

IED's collaborative experiences with the Nairobi innovation suggest that the Model holds considerable promise as a viable inservice teacher education approach which, with appropriate modification, could be adopted on a wider scale in other contexts.

Notes

- (1) McIntyre, Donald, Hazel, Hagger & Margaret Wilkin, (Eds) 1993), *Mentoring: Perspectives on School-Based Teacher Education*, Kogan Page, London.
- (2) Pardhan, Harcharan, Alan E. Wheeler (1998). Enhancing science teachers' learning through pedagogical content knowledge. *Science Education International*, Vol. 9, No. 4, December, Pp 21-25.

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