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FOREWORD

Some key questions with no easy answers

Dr Gregory P. THOMAS

Head, Department of Science
The Hong Kong Institute of Education
HONG KONG, CHINA
Email: gpthomas@ied.edu.hk

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Key Questions

How do we know what we as science educators teach in our science education methods courses is appropriate for developing high quality science teachers? How do we decide? Who else, besides us, decides? What are our criteria? What are others' criteria and how do their criteria compare with ours? Why are our criteria valid? Are

others' criteria more, less, or equally valid in comparison to ours. I have pondered such general questions in response to Norman Lederman's Presidential address at the annual meeting of the National Association for Research in Science Teaching in New Orleans in 2002. Lederman refloated common conundrums that I'm sure many science educators consider as we develop our science teacher education courses and in thinking about our community roles and responsibilities as science educators. Two issues he raised were, (a) that our research and what we teach does not resonate with either policymakers or teachers and, (b) that the research questions "that we ask very often just don't make sense to the concerns and needs of classroom teachers" (p. 4). No body who has been in science education for more than 5 minutes will be too surprised by these propositions. But how do we respond to them? How do we justify what we teach our students and our research agendas within the broader educational landscape? While we might be interested in promoting scientific literacy, helping students develop an understanding of the nature of science, developing a focus on student inquiry, or in my own case developing students' metacognition, how can we be sure that our interests match those interests of other educational stakeholders, and what do we do if they do not match? In what follows I reflect briefly on the current situation in Hong Kong and ask readers to seek comparisons between Hong Kong and their own educational contexts as they seek responses to these important questions and issues. Finally, I point to selected research that provides some examples of how shared criteria in relation to classroom reform, which is at the heart of educational reform, can be developed.

Science Education Reform in Hong Kong

Presently in Hong Kong, as in other countries, substantial efforts are being made in developing science curricula and pedagogies that cater for a diverse student population. There are new curriculum documents focused around Key Learning Areas and a 'Learning to Learn' philosophy and consultations on those documents. Eventually change is supposed to happen in schools. Of course this implies some change in teachers' thinking and practice so that there will be changes in their students. However, research tells us that educational change is difficult to effect as it is a complex process, the complexity of which is not to be underestimated. Science teacher education courses respond to new curriculum initiatives and in Hong Kong's case many of the initiatives are in line with current thinking on best practice in science

teaching and are supported generally by available research from Hong Kong and overseas. Therefore there is a reasonable level of congruence between the proposed reforms and what is proposed within contemporary science education. Further, many tertiary science educators are actively involved in the process of curriculum development in Hong Kong. Therefore, there is some impact of the research community in Hong Kong on policy. However, the proposed reforms will still happen against a backdrop of the issues and varying levels of disconnection between teacher education institutions and schools and the teachers within them that were raised above. Our roles as science educators in supporting education reform rely heavily on teachers and schools perceiving that we might be relevant to the forthcoming challenges and also on them being willing to engage in constructive and thoughtful dialogue with us. However, many teachers are skeptical of the need for and nature of the reforms and their theoretical underpinnings, and initiating and developing the dialogue that leads to measurable improvement in students' learning outcomes, as previously mentioned, may be problematic. I have noted that teachers and principals often assign different criteria to me and some of my colleagues when evaluating the performance of potential soon-to-be colleagues and employees who attend their schools for teaching practice attachments. This has become increasingly clear to me as I have listened to mentors in schools discuss the teaching of student teachers taking my methods modules. The differences in what criteria are applied become apparent. However, we should be mindful to respect such differences and use our knowledge of such differences to initiate empathetic dialogue with teachers and principals because their perspectives are truly valid for them and form part of their referents that guide their actions and thoughts in relation to teacher education. What also becomes evident is that at least some of what is taught in methods courses is not seen as relevant to the context of schools and practicing teachers. Some principals in Hong Kong highlight their perception of this lack of relevance in preferring to hire non-trained teachers.

Tentative proposals

Obviously this is an area we, as science educators, need to work on. Lederman was referring specifically to the United States context when he strongly alluded to this but I suspect such a situation is quite universal. Expecting that schools and teachers will be knocking science educators' doors down for cooperation has been and still is clearly inappropriate in all but a handful of cases. I strongly agree with the old adage

that teachers are the keys to educational reform. This presents a problem because there is a need for teachers to perceive that change is necessary and for them to be willing to step away from or modify some of their well-established pedagogical patterns before reform can be effected. Consequently, the process of reform can take considerable time and effort. Building relationships with teachers and schools takes time and it is us who need to be willing to approach teachers and listen to the views emanating from schools. To develop a common set of criteria for evaluating educational outcomes there is a need for trust and a shared vision to be developed. This will only happen initially through face-to-face dialogue and visiting schools is I think a powerful means for this. Findings from the seminal Project to Enhance Effective Learning (PEEL) (Baird & Mitchell, 1986; Baird & Northfield, 1992) and smaller scale research that I was involved in (Thomas & McRobbie, 2002) have convinced me that trust and shared vision can be developed, that reform can proceed and that the outcomes for schools teachers and their students are considerable. The criteria for evaluating progress may not be immediately apparent either to teachers and or the science educators involved. Rather they develop over time as collaboration proceeds. The aforementioned references also attest to the need for patience in this pursuit and highlight the possible research benefits from such collaboration between academics and practicing teachers. It is now almost 20 years since PEEL began and many people, and I would count myself as one, have benefited from the lessons learned through its operation. When I was a practicing high school science teacher it had a profound influence on how I saw the potential benefits of university academics working in collaboration with classroom teachers. Still today I believe it still serves as a powerful model of how science educators, teachers and schools can develop shared criteria for understanding and evaluating teaching and learning and hence for helping all members of the education community to have input into teacher education and development. There are no easy answers to the questions raised earlier in this foreword, however there are successful examples of how academics can work with classroom teachers and schools to better understand each other and engage in the dialogue that is so necessary for true reform to eventuate. It is important to search for these examples, to draw on the available case studies and research, if we are to begin to search further for answers.

References

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