Capacity Building: Home and Away

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Abstract: *Many countries are at pivotal points for reforming their education systems, particularly Asian countries moving into English as the medium instruction. The Ministry of Education Malaysia aims to reach its government's Vision 2020 for education reform, which includes teaching science education in English. Achieving Vision 2020 requires capacity building for Malaysian teaching institutes and their lecturers. The capacity building in this study involved professional development on specific preservice teacher education units conducted through Australian and English universities. Thirty-one Malaysian lecturers from two institutes were involved in professional development with three Australian university lecturers associated with a new primary science education degree. In addition, 96 Malaysian preservice teachers were co-taught by both the Malaysian and Australian lecturers over a two-week period, which provided lecture and tutorial demonstrations on science education, English, and human development psychology. This paper highlights capacity building in the areas of teaching and learning for Malaysian teaching institutes and the affiliated Australian university. Malaysian and Australian lecturers and the Malaysian preservice teachers gained an opportunity to refine their pedagogical knowledge and content knowledge with linkages to current theories (i.e., on science education, English, and human development psychology). International collaboration appeared to enhance teaching and learning programs by globalizing coursework, and presented potential for collaborative research.*

INTRODUCTION

Malaysia aims at developing a world-class education system to strengthen its economic position in the world market (Rahman Idris, 2005). The Ministry of Education Malaysia also aims to reach its government's Vision 2020 for education reform, which includes teaching science,

mathematics, and design and technology using English as the medium of instruction (EMI). The key focus has been placed on enhancing scientific literacy, which is considered central to education reform (Ayala, 2005; Gallagher, 2000; Pattanayak, 2003). Yet, science knowledge is widespread in English, particularly with the Internet, and English as Global Language (EGL) countries wish to access this knowledge for economic development. Educators (Berleur & Whitehouse, 1997; Meethan, 2001) note English as a contributing factor for globalization while other educators (Haley & Rentz, 2002; Larsen-Freeman, 2000; Lu, 2002; Wertheimer & Honigsfeld, 2000) highlight the essential nature of preparing preservice teachers for teaching science in EGL in order to be at the forefront of globalization.

Preparation for teaching primary science involves preservice teachers analysing and understanding current theories that underpin a science curriculum and developing adequate pedagogical knowledge and content knowledge (Fleer & Hardy, 2006; Morine-Dershimer & Kent, 1999). However, EGL preservice teachers have an additional challenge that is, learning to teach science with links to current education reform measures and learning to teach this subject using EMI (Hudson & Nguyen, 2007). The Malaysian education system aims at addressing simultaneously these two key educational reform measures (i.e., teaching science and teaching science using EMI).

In addition to shifting to EMI, Malaysia is moving from a diploma to degree status for preservice teacher education programs in its teaching institutes so as to advance its education system. The Ministry of Education Malaysia determined that the facilitation of a new degree required input from English-speaking countries (England and Australia) experienced in providing Education degrees. These arrangements had complex challenges with differences between pedagogical paradigms. It has been observed that in Malaysia, as in many other countries, teachers and textbooks were once authoritative. Textbooks were thought to contain all that was worth knowing. Teachers spoke while students listened and learning involved acquiring large quantities of information from teachers and textbooks. Students were examined on their capacity to reproduce the information. Factors such as class size, limited resources, and the teacher viewed as an authoritative source of knowledge contributed to the adoption of a teacher-centred approach as the pedagogical practice. While this approach may have been appropriate for earlier times, it no longer produces students with the capabilities needed in new workplaces and societies (Pandian & Balraj, 2005) where a student-centred approach is advocated (e.g., Fleer, Jane,

& Hardy, 2006). A key part of changing this view and generating education reform will necessitate professional development for Malaysian teaching institutes conducting a new degree.

Professional development is viewed as central to educational reform (Elmore, 1996; Hawley & Valli, 2000; Huey-Por & Chorng-Jee, 2005). Professional development activities must meet the needs of teachers who are at different career stages (Ganser, 2000), and teachers should be able to determine their needs for enhancing their own teaching practices (McCarthy & Riley, 2000). Researchers (e.g., Cobb, 2000; Ganser, 2000; McCarthy & Riley, 2000) have articulated contemporary principles for professional development of teachers. Fundamentally, professional development should: deepen and broaden knowledge of content; provide a strong pedagogical foundation; provide knowledge about teaching and learning processes; be based upon current research that also align with curriculum standards; and be designed by teachers in cooperation with experts in the field to include sufficient time, support, and resources (American Federation of Teachers, 2002). Furthermore, professional development should take a variety of forms, and allow sufficient time for colleagues to share ideas and facilitate guided risk-taking through workshops (Bondy & Ross, 2005; Hoewisch, 1998). Most importantly, effective professional development facilitates interactions with teachers (including lecturers) on successful classroom practices and innovations (King & Newmann, 2000). Overall, professional development programs need to be planned to address the learner's needs and should be goal focused (see Bondy & Ross, 2005).

Professional development requires collaboration employing experts who are knowledgeable about learners' needs. In education, the two-way engagement between those requiring professional development and a tertiary institute is recognized as an investment strategy advocated by Australian universities (Garlick, 2000). Collaboration, which includes professional development programs, is fundamental for capacity building and is "at the forefront of the attributes required by communities to generate viability in the global economy" (Garlick, 2003, p. 2). Developing learning communities necessitates partnerships for cultivating capacity-building communities (Kilpatrick, Barrett, & Jones, 2003). The Queensland University of Technology (QUT) Blueprint (2007) emphasizes engagement as a theme to guide strategic thinking, and implementing this direction requires "partnering with other organisations" to "open up opportunities" and "provide ways of sharing resources or programs" (QUT Blueprint,

2003, p. 7). QUT statements and briefs guide campus staff activities, which also entails international collaboration for community engagement and capacity building. Yet, how can a university collaborate internationally and what are the effects of capacity building for all stakeholders?

The Malaysian government's Vision 2020 for education reform has generated various plans. The thrust of the Ninth Malaysia Plan, 2006–2010, is to target preservice teacher education by developing specialist primary teachers who can teach specific subjects such as science using EMI (Rahman Idris, 2005). This plan has motivated the Ministry of Education Malaysia to draw upon international resources to move from diploma to degree status in their institutes, and as such invited universities from Australia (Queensland University of Technology and Deakin) and England (University of Hertfortshire and Canterbury Christchurch University) to design and implement new Bachelor of Education degrees that focus on science (and mathematics and design and technology) education. This study describes the professional development facilitated in Malaysia for a primary science degree and focuses on the capacity building received by both the Malaysian teaching institutes and a university as a result of this collaboration.

CONTEXT AND METHODS

Two institutes in urban areas of Peninsular Malaysia collaborated with Queensland University of Technology (QUT) in the program described in this paper. Each institution offered the science program to cohorts of high-achieving students for teaching primary science throughout Malaysia. Thirty-one Malaysian lecturers were involved in professional development with three QUT lecturers associated with a new primary science education degree. In addition, 96 Malaysian preservice teachers (50 at one institute and 46 at the other) were co-taught by both the Malaysian and QUT lecturers over a two-week period with some lectures and tutorials demonstrated by QUT staff. This study focuses on the third semester of the degree as the three QUT staff were involved in the third semester on site; nevertheless, a brief outline of the previous two semesters will be provided.

Semester 1 was conducted in Bahasa Melayu and involved compulsory studies required by the Ministry of Education in Malaysia (e.g., Islamic studies, co-curriculum). Semester 2 comprised four units,

that is: (1) the development of skills in information and communication technologies; (2) primary curriculum and pedagogy in health and physical education; (3) English for teachers; and, (4) an integrated mathematics and science foundation unit to develop scientific and quantitative literacy. There was also a two-week school-based experience for these preservice teachers to commence forming understandings of their primary school education system. During the second semester, all lectures, readings, workshops, and assessments were delivered in English. Lecturers and preservice teachers had to use English as the target language. It was a requirement that these preservice teachers live on campus in the accommodation provided for the duration of each semester.

Semester 3 involved four units, viz: Human development, primary science pedagogy, Earth and space, and an English language and literacy unit. Each unit had a specific design, for example, the English language and literacy curriculum unit was designed to equip preservice teachers to work with primary school students who were: (1) learning to read (novice readers); (2) reading to learn (fluent readers); and (3) learning to write scientific text. Theoretical frameworks were selected to enable the students to think critically about a wide range of pedagogical approaches for teaching English language and literacy while considering the requirements and beliefs of local contexts, the demands of economic and cultural globalization on educators, and the ICT revolution in textual environments. These included notions of multimodal text design developed by multiliteracies theorists (Cope & Kalantzis, 2000), and a pedagogical theory, focused on knowledge processes, developed by Learning by Design theorists (Kalantzis & Cope, 2005). Content focused on areas of particular importance for second language learners, including multilingual reading processes, vocabulary, comprehension, spelling and scientific genres. Assignments required preservice teachers to: (1) plan a science lesson highlighting the English language and literacy support provided; and (2) observe and report orally on the language and literacy support provided by a practising teacher of science.

As this was a primary science degree, units aimed to make links with science education. To illustrate, the literacy unit covered controversial issues such as the role of the science teacher in teaching English language and literacy, and the history of pedagogic colonization by Western English language teachers. Students were encouraged to debate the language teaching role of the science teacher, using perspectives from the literacy literature as provocations (e.g., Manzo,

Manzo, & Estes, 2001). Care was taken to link pedagogic approaches encouraged in the unit with Malaysian imperatives: "[Graduates] need to have the confidence, ability to solve problems and have the command of at least two languages ... We need our students to add value to their studies ... and to challenge themselves. They have to be innovative and develop their creativity" (PM Datuk Seri Abdullah Ahmad Badawi, New Straits Times, 17/01/07, p. 2). Further care was taken to avoid proselytizing any particular method of English language education, but rather to equip the Malaysian preservice teachers with an understanding of the strengths and limitations of a range of pedagogic methods. Data from the Malaysian lecturers were collected through questionnaires and discussions.

Malaysian lecturers shared with QUT lecturers a strong basis of common knowledge on the semester 3 units. For example, the language and literacy lecturers in both institutes had been experienced school English teachers prior to working in the tertiary sector. Many had qualifications from English-speaking countries, and all had specialist TESOL qualifications. The lecturers were involved in curriculum development, teacher professional development, and other forms of educational leadership. The Malaysian lecturers were also aware of historically important methods of English-language teaching, and the debates and controversies around content and methods of EGL teaching.

RESULTS AND DISCUSSION

The process of developing the Bachelor of Education Studies units commenced with each QUT unit coordinator compiling Week 1 documents. These comprehensive documents provide a brief synopsis of the unit, a description of the rationale, aim and objectives of the unit, teaching and learning approaches, an overview of content areas, assessments, and necessary resources. It also provides a scope and sequence of teaching and learning activities for the semester; including lecture topics, tutorial activities, relevant readings from recommended textbooks, and associated online learning and teaching resources (e.g., lecture PowerPoint slides, lecture study guide, course materials database, class handouts, educational activities and applications, important web-based links, research skills tutorials).

Specific feedback was sought from Malaysian lecturers and academic coordinators in relation to the suitability of the unit's content, tutorial activities, and assessment requirements, and the feasibility of the lecture and tutorial sequence in relation to Malaysia's academic calendar. Modifications of the document were made accordingly. Upon receiving support for each unit's Week 1 document, QUT university lecturers developed, in consultation with their respective Malaysian counterparts, online learning and teaching (OLT) resources for each unit. Malaysian unit coordinators were given administration rights enabling them to make appropriate adjustments to the OLT resources (e.g., Week 1 document, lecture PowerPoint slides and study guides) throughout the semester if required and to use the site as a way of distributing important information (e.g., recommended tutorial or exam preparation) to an entire preservice teacher cohort.

Capacity building for Malaysian lecturers

The Malaysian lecturers were responsible for delivering lectures, facilitating tutorials, and marking the preservice teachers' assessment tasks. Each lecturer was required to have a high degree of knowledge and comprehension of the lecture topics, skills in facilitating tutorials, and a clear understanding of assessment criteria used for evaluating student teachers' work. It was therefore necessary to further build the professional capacity of Malaysian unit coordinators and tutors for successful and confident delivery of these new units. Professional development took place in Malaysia over a five-day period, which was prior to students commencing semester 1. During this Curriculum Week, Malaysian lecturers were briefed on how each unit's aims and objectives corresponded to Education Queensland's Educational Practitioner Attributes and the Queensland College of Teachers' Professional Standards of Teaching, and were provided detailed information on their specific unit requirements, particularly with respect to pedagogy and assessment. QUT unit coordinators explained the process of developing criterion-referenced assessment rubrics and the value of providing formative feedback to students throughout the semester to enhance their learning (a practice not readily observed in the Malaysian teaching institutes involved).

To gain a deeper understanding of an Australian university's academic grading system, examples of Australian students' assignments, reflecting various grades, were distributed to Malaysian lecturers associated with specific units. Practices in facilitating professional

development varied between QUT lecturers. For example, in one unit, Malaysian lecturers were given the opportunity to practice marking some assignments according to the assessment criteria sheet and following moderation as a group, a final grade for each assignment was determined. In addition, Malaysian lecturers received training on manipulating their specific unit's online website and accessing relevant electronic resources from QUT's library (e.g., databases). Professional development also took place in the first two weeks of semester 1 at the Malaysian institutes. For each unit, the Australian and Malaysian lecturers worked together to co-deliver specific lecture topics and co-facilitate tutorials. The QUT coordinators also provided lectures as requested and familiarized Malaysian students with the online website linked to each unit, other useful QUT website links (e.g., referencing, academic integrity), searching research databases, and computer accessing procedures. Later in the year, QUT's coordinators will join the lecturers from Malaysia to assist in the process of moderating preservice teachers' assessment grades.

Preservice teacher capacity building

Given that these preservice teachers will later teach primary science, mathematics, and design and technology to their Malaysian students in English, it was educationally sound that they also learnt these subjects in English. During their education program, Malaysian preservice teachers explored current educational research and theories, and discussed associated educational applications with their lecturer and peers. Some preservice teachers continued gathering their thoughts in Malay and trying to translate from their native language into English. It was expected that, over time, their English fluency would improve as they learnt to gather their thoughts and respond in English. Bringing information and communication technology (ICT) into Malaysian classrooms provided preservice teachers with the opportunity to refine their computational and Internet skills. Using ICT for e-learning was essential for tertiary education and, as a result, these students were equipped with laptops and in-built wireless capabilities, which was also beneficial for accessing journals, textbooks and other hard copy resources. Throughout their degree program, these preservice teachers will learn how to access information from a variety of sources, sort through it, make sense of it, assess its validity, and explore the implications of its content (e.g., see Woolfolk & Margetts, 2007). Acquiring these higher-order thinking skills is important for today's

educators as information on the Internet can be uncensored and unsubstantiated.

Whilst teacher-driven approaches have been common in Eastern countries, preservice teachers in this program were learning the value of adapting teaching methods to meet specific learning objectives and individual student needs. For instance, these preservice teachers may use direct instruction to help students learn basic knowledge and skills, but also use discovery learning approaches combined with scaffolding and dialogue to enhance students' creativity, abstract thinking, and problem solving skills, as advocated by Woolfolk and Margetts (2007).

Lecturer capacity building

Lecturers from the two Malaysian institutes were generally enthusiastic to learn different methods of teaching that encouraged preservice teachers to take individual responsibility for their learning and to adopt a deep approach to understanding the content. One lecturer indicated on a questionnaire that "through this program I've experienced new ideas and challenges that have enriched my teaching methods, strategies, as well as knowledge about the subject matter." One of the assessment tasks for Human Development involved students forming groups of six with each student in the group delivering a microteaching lesson to their peers on a specific topic. Students were taught how to reflect critically on the research material, to interpret, analyse and synthesize information, and to consider its educational implications. Students used a range of visual props to assist their peers' learning including well designed Powerpoint presentations, comprehensive diagrams, and handouts. One lecturer suggested:

> Students sometimes give presentations to the whole class, but they have not worked in small groups before but I can see that they talk about the topic more in small groups. The students help each other to understand the topic. I think they feel more confident working in small groups, more comfortable sharing. I will use this again because the students are happy.

Even though learning can occur through reading and reflecting on the literature prior to weekly tutorials, engaging in collaborative small group discussions enabled these preservice teachers to explore key ideas further and develop critical ways of thinking about the material

presented. For some lecturers, however, it was a challenge to deliver the units in English. In the past, lecturers have primarily delivered lecture material in Bahasa Melayu and their levels of English competence varied.

One lecturer noted:

> Before this, I have experienced teaching using English, but this is quite different. Sometimes I feel quite nervous on whether I could do it. But so far it is OK. As for the students, they are also having difficulties in comprehending and corresponding in English. To help students, I will translate things that they do not understand in Malay so that my explanations are bilingual: English and Malay.

As lecturers become more familiar with the concepts and subject matter, it was anticipated that their capacity to teach and write in English would be enhanced. Several Malaysian lecturers have expressed interest in working collaboratively with QUT's lecturers on research projects that will further develop their teaching and research capabilities. One lecturer indicated "Few lecturers write about their teaching. There is no pressure to publish here. But I would really like to know how I can do this."

Personal professional development

Rebecca (one of the authors of this paper and an early career academic) found the experience of developing the unit "Human Development" both rewarding and challenging. This unit was relevant to the preservice teachers as they needed an understanding of human development in order to plan learning experiences that are congruent with their learners' developmental levels and abilities. It also prepared preservice teachers to consider the role that they will play in fostering a supportive learning environment that values diversity and individual differences (e.g., students with learning difficulties and other special needs) in the classroom. Rebecca indicated:

> Due to the students' varying levels of English proficiency, I was aware that I needed to utilise a range of teaching resources to engage students. I used visual

> aids (e.g., diagrams and photos) and used large hand gestures to convey the meaning of words, whilst simultaneously slowing my speech and using simple, clear, concise words. I asked the students' questions at critical points throughout the lecture to assess their understanding of the topic. I also reduced the amount of material I would normally present in a lecture and instead explored in depth key points related to the topic.

In this unit, preservice teachers were introduced to the significant theoretical frameworks that have contributed to understanding human development across a human life span. These theories, however, are largely biased in favour of Western values that emphasize individualism. To provide Malaysian preservice teachers with a view of human development that they could relate to more closely, theoretical perspectives and current research from Eastern perspectives that are group or family-centred were included where possible. This proved difficult at times. To date, there does not appear to be a comprehensive educational psychology textbook that specifically explores development across human lifespan from an Eastern perspective. Furthermore, research studies exploring human development from this viewpoint were limited. During tutorial discussions, these preservice teachers of various races (e.g., Malay, Chinese, Indian) shed light on the applicability of the developmental theories as they critically examined them in relation to their own cultural and religious backgrounds.

> I was impressed by the preservice teachers' discussions on how the theories of development applied to teaching in Malaysia. They carefully considered the implications of the research in relation to their professional context and also gave varying explanations of human development depending on the ethnic and religious beliefs.

Capacity building of QUT units

Schools are not homogeneous and preservice teacher preparation needs to consider diverse cultural populations. So-called debates over

migration notwithstanding, the Australian school population has continued to diversify through migration from a widening range of countries in recent decades (Meyenn & Parker, 1999). In addition, international enrolments in Australian schools, including primary schools, have jumped dramatically since the 1990s, although absolute numbers remain relatively small (Walker, 2004). Finally, intense global competition for teachers means increasing numbers of Australian-trained teachers are working abroad (Walker, 2004). In short, more Australian teachers are working "on the front line" of cultural globalization in "global contact zones" where intercultural competence is essential to negotiate daily moments of discomfort, offence and distrust across linguistic and cultural borders (Singh & Doherty, 2004).

Reflecting on the significant cultural diversity that exists among the Australian university student population had prompted Rebecca to encourage QUT preservice teachers to further explore the influences of culture and ethnicity on the learner's development. In tutorial classes, preservice teachers shared how their culture, familial, religious or ethnic background have shaped their personal learning experiences. Furthermore, the implications of cultural and linguistic backgrounds on preservice teachers' personal and professional development as educators were also considered. The revised unit encouraged preservice teachers to use pedagogical practices that promoted national unity whilst respecting the cultural and linguistic diversity that exist in Australian classrooms.

CONCLUSION

Malaysia is at a critical point of education reform, and interactions with other education systems may aid capacity building of such systems. To meet this educational reform in Malaysia will require teaching primary science using EMI. This means targeting primary science education concepts and English concepts simultaneously if the Vision 2020 goal is to be reached. Both in Malaysia and abroad, employment prospects are enhanced for bilingual educators. Yet, it should be noted that there has been and continues to be considerable controversy in Malaysia around the place of English as a global language and the teaching of science in English (Pandian & Balraj, 2005). Nevertheless, preservice teacher education course construction will be paramount for injecting new educational ideas into the system but can also have a flow-on

effect for providers of professional development. The course structure for the Malaysian Bachelor of Education Studies degree in primary science has nine units of science (Goodrum, Hackling & Rennie, 2001) whereas most preservice primary teacher degree programs in Australia only contain one or two primary science units with a possibility of an elective or two. If scientific literacy is a way forward for economic gain and preservice teacher education is a formative area to target then Australian universities also need to investigate the effects of degrees (e.g., in Malaysia) that incorporate more science units. Hence, capacity building for collaborating English-based universities can be an additional spin off as a result of involvement in such projects.

The education of preservice teachers must be a focus of attention in an effort to obtain quality teaching (e.g., Haley & Rentz, 2002; Larsen-Freeman, 2000) and gain access to the world's knowledge base on science. Investigating preservice teacher development during this formative period can aid in refining programs to further enhance such development. Preservice teachers involved in this new degree may provide information about their preparation for teaching science using EMI that can guide educators' construction of coursework. Yet, capacity building extends to both the receiver and the provider of professional development. Further investigation would be required to determine if Malaysian lecturers and QUT lecturers employed reform measures in their coursework and whether the results of this collaboration can be measured in terms of preservice teacher achievement.

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