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The Action – Reflection – Modelling (ARM) Pedagogical Approach for Teacher Education: a Malaysia-UK Project

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Abstract: This article presents the Action – Reflection – Modelling (ARM) pedagogical approach for teacher education developed during a Malaysia-UK collaborative project to construct a Bachelor of Education (Honours) degree programme in Primary Mathematics, with English and Health and Physical Education as minor subjects. The degree programme was written collaboratively by teacher educators in two Institutes of Teacher Education in Malaysia and in the University of Hertfordshire, UK, to meet the requirements for training Malaysian school teachers to teach in Malaysian schools. A cohort of 120 students studied the programme full-time over four years, graduating in 2010.

The three principles of the ARM approach were chosen to underpin the learning and teaching for the programme. These principles highlight the role of active participation and active learning on the part of the learner; the value of reflective learning and reflection for both student teachers and pupils; and modelling by staff to student teachers and by student teachers to pupils in school. The approach was aligned with the curriculum specifications for mathematics in primary schools in Malaysia, which emphasised components of active learning.

This article explains how the ARM approach was developed, shared and used during the BEd degree programme; provides the rationale for selecting the three principles; and describes the research methods used to explore the views and experiences of programme participants. Some findings from the research are presented, drawn from a dataset that comprises survey responses from more than 180 participants: Malaysian senior managers, teacher educators, student teachers and school mentors. The findings are discussed in the context of using ARM in teacher education and in primary schools in Malaysia, and of implementing change in learning and teaching.

Throughout this project the teacher educators from Malaysia and the UK engaged in dialogue about their professional practice and learnt about the personal, professional and cultural values and beliefs that shaped the pedagogies of both parties and of the individual practitioners. The value of articulating pedagogy as a means of developing practice endorses the views of others with expertise in this area who stress the importance of making pedagogies explicit in teacher education and has implications for the practice of student teachers and teacher educators.

Introduction

This article presents the Action – Reflection – Modelling (ARM) pedagogical approach for teacher education developed during a Malaysia-UK collaborative project to construct a Bachelor of Education (Honours) degree programme in Primary Mathematics, with English and Health and Physical Education as minor subjects. The degree programme was designed using the expertise of partners in two Institutes of Teacher Education in Malaysia and in the University of Hertfordshire, UK. Three learning and teaching principles, action, reflection, and modelling, were chosen by a group of experienced teacher educators to underpin the learning and teaching approach for the programme. These principles highlight the role of active participation and active learning on the part of the learner; the value of reflective learning and reflection for both student teachers and pupils; and modelling by staff to student teachers and by student teachers to pupils in school.

This article outlines the context for education and teacher education within Malaysia and the UK and the main pedagogical approaches used in teacher education and in schools in both countries, before identifying some of the issues involved in pedagogical change, and describing the setting for this study. The purpose of this article is to explain how the ARM approach was developed, shared and used during the degree programme; and present and discuss some of the findings from the surveys conducted to explore the participants' views and experiences of the approach. This discussion focuses on issues relating to using ARM in teacher education and in primary schools in Malaysia, and of implementing change in learning and teaching. The article concludes with some implications for practice.

Context

Education in Malaysia and the UK

Education is a high priority for the Malaysian Government and recent decades have seen frequent reforms in education policy and the curriculum (Prime Minister's Department/United Nations Country Team, Malaysia, 2011). In 2001, the Ministry of Education Malaysia developed an Education Development Plan for Malaysia 2001-2010 (Ministry of Education Malaysia, 2001) followed by the Education Development Master Plan in 2006, designed to act as a guideline for implementing education development under the Ninth Malaysia Plan (2006-2010) (Prime Minister's Department/United Nations Country Team, Malaysia, 2011).

The National Education System in Malaysia includes preschool education (for pupils aged four to six years), primary education, secondary education and post-secondary education. Primary education, the focus for this project, is compulsory; and Malaysia is close to reaching its target for Millennium Development Goal 2, to achieve universal primary education by 2015 (Prime Minister's Department/United Nations Country Team, Malaysia, 2011). Pupils take the first of three sets of national examinations: the Primary School Achievement Test, Ujian Penilaian Sekolah Rendah (UPSR) after six years of primary schooling (Prime Minister's Department/United Nations Country Team, Malaysia, 2011).

The education system in England is divided into primary education, secondary education, further education and higher education. Children can also attend preschool education. Primary and secondary education is mandatory, from the age of about 5 to the age of 16 years. There are

five 'key stages'; National Curriculum Key Stages 1-2 (for pupils aged 5-11 years) is generally completed at primary school. There are some differences in the education system in other parts of the UK.

Teacher Education in Malaysia and the UK

The Education Development Plan for Malaysia 2001-2010 set out aims for development of the teaching profession. For primary education these aims included ensuring that by 2010, 50 percent of primary school teachers would be university graduates (Ministry of Education Malaysia, 2001). The overall aim is that all teachers should be degree holders by 2020, with training pathways defined for those that already have a teaching diploma (Idris, Loh, Nor, Razak, & Saad, 2007). The teacher selection process is stringent as the Ministry of Education Malaysia 'selects only those who possess the quality, competency, integrity, qualification, interest, commitment and passion of an educator to become teachers' (Prime Minister's Department/United Nations Country Team, Malaysia, 2011, p. 33). Candidates selected for pre-service primary school teacher education must successfully complete an eighteen month foundation course before taking a four year degree programme. Successful trainee teachers are awarded the Bachelor of Teaching degree at the end of their training. They take up posts in primary schools in Malaysia and work for three years 'before they are confirmed as full-fledged teachers' (UNESCO; International Reading Association, 2008, p. 82).

In 2002, the Government of Malaysia made a policy decision to change the medium of instruction from the Malay language to English for the teaching and learning of mathematics and science subjects in Malaysian schools. The implementation of this policy, known as Pengajaran dan Pembelajaran Sains dan Matematik dalam Bahasa Inggeris (PPSMI) began in 2003. This policy was in place during the course of the project described in this paper but was reversed in 2009 because pupils' performance in mathematics and science had deteriorated and PPSMI had not been implemented as planned (Singh & Sidhu, 2010).

In England, successful completion of initial teacher training (ITT) is a requirement for teaching in state-maintained schools. This can be completed through different routes, for example, through studying an undergraduate degree, a Bachelor of Education (BEd) or Bachelor of Arts (BA)/Bachelor of Science (BSc) with qualified teacher status course or a postgraduate certificate in education (PGCE). On achieving qualified teacher status all newly qualified teachers must successfully complete an induction period. Primary school teachers in England work with children aged between three and eleven years of age. They are expected to teach all the subjects in the national curriculum and to demonstrate a sound, basic knowledge of all those subjects. They do not need to have a degree in a specialised subject.

Pedagogical Approaches used in Malaysia and the UK

Although there are many similarities between the education systems and approaches to learning and teaching in Malaysia and the UK, there are some differences that are particularly relevant to this study. For example, in Malaysia, unlike the UK, examinations are an important form of assessment in teacher education programmes and subject knowledge has prime importance. In teacher education within the UK, there has been a move away from a theoretical and towards a more practical approach to teacher education (Wilkin, 1996). There are risks

associated with both theory-based and practice-based approaches (Tigchelaar & Korthagen, 2004).

This section of the article focuses on the main pedagogical approaches used in teacher education and in schools in the two countries and explores some of the similarities and differences between them. These are generalisations; there is wide variation in the practice of teacher educators and teachers in both settings with considerable overlap between them. Although espousing fundamental principles on which they base their practice, many experienced teacher educators also adjust their approaches to learning and teaching depending on the learners and the setting. In acknowledging 'that teaching is complex and messy' Loughran (2006, p. 18) recognises 'that it can be approached, interpreted and practiced in a diversity of ways, any of which when used by a skilled teacher may lead to successful learning outcomes for students.' Noting that the term 'pedagogy' has often simply been used as an alternative word for teaching, he suggests the following wider definition, which is used in this article:

> '...Therefore, pedagogy is not merely the action of teaching (which itself can easily be misinterpreted as the transmission of information), more so, it is about the relationship between teaching and learning and how together they lead to growth in knowledge and understanding through meaningful practice.' Loughran (2006, p. 2)

More traditional approaches to education often used in Malaysia have tended to centre on the teacher rather than the pupil (Galam, 1997; Ali, 2007). Less emphasis could be given to lone working and pupils' acquisition of information and knowledge in favour of developing understanding, active learning, and engaging in discussion and work with teachers and peers (Effandi & Zanaton, 2007). There has been a move towards national curriculum specifications that emphasise components of active learning, for example, those for mathematics in Malaysian primary schools (Ministry of Education Malaysia, 2006). Ali (2007), however, reported a more teacher centred approach in a study of communications in two teachers' primary mathematics lessons that was at variance with this. Pedagogical approaches that involve rote learning are commonly used in schools whereas social constructivist approaches are often used in the UK, which involve active learning. Despite differences in definition, Edward (2001, p. 431, emphasis in original) suggests most people would agree that constructivism: '...implies that learning is *constructed* from *experience* when the learner, in *collaboration* with others engages in *activities* which are *realistically* situated and incorporate the opportunity to *test* the new-found knowledge...' Constructivist approaches are not without their critics; for example, Kirschner, Sweller and Clark (2006, p. 76) suggested that 'The past half-century of empirical research on this issue has provided overwhelming and unambiguous evidence that minimal guidance during instruction is significantly less effective and efficient than guidance specifically designed to support the cognitive processing necessary for learning.'

Changing Pedagogy in Teacher Education

In a recent survey of approaches to educational reform in five countries of Southeast Asia, including Malaysia, educational policy-makers and academics with relevant national expertise reported their perceptions of obstacles to reform and strategies that had developed in their country during the previous decade (Hallinger, 2010). In Malaysia, the obstacles included: a tendency for reforms to be top-down, with limited involvement by stakeholders; differences in power between layers of hierarchy; limited preparation and development of staff; and importantly a discrepancy between the reforms and the local culture. 'Such considerations are even more important when seeking to transplant the innovation from a Western to an Eastern

culture where differences in cultural values and norms influence the receptivity of practitioners to innovations and the length of time it will take to change past behaviours' (Hallinger, 2010, p. 412). Hallinger (2004) acknowledges the particular challenge faced by countries that want to change teaching and learning processes. Large-scale educational reform not only has to be established but sustained, which requires continued support (Fullan, 2000).

In terms of approaches to teacher development, Hayes (1995) drawing on experience from two projects, one in primary education in Malaysia and the other in secondary education in Thailand, noted the need for participants to have 'a sense of ownership of the programmes in which they are involved' (p. 261) and proposed some principles for teacher development. Several of these principles are particularly relevant for the project presented in this paper. Broadly, these include: collaborative preparation of the programme; engaging in discussion and developing understanding of teaching and learning; and valuing, discussing and sharing teachers' existing perceptions, knowledge and practice.

Overview of this Study

The Setting

The Ministry of Education Malaysia awarded the University of Hertfordshire School of Education a bid to design, validate, support and quality assure a Bachelor of Education (Honours) (BEd) in Primary Mathematics degree for initial teacher training for a single cohort of 120 students over four years, from 2006 to 2009. The students studied full-time in two Institutes of Teacher Education in Malaysia: Institut Perguruan Kota Bharu (IPKB) in the north of peninsular Malaysia near the Thai border and Institut Perguruan Temenggong Ibrahim (IPTI) in Johor Bahru in the south of peninsular Malaysia near Singapore. Both Institutes offer initial teacher training and professional updating courses for qualified teachers. The University of Hertfordshire (UH) School of Education offers a range of undergraduate and postgraduate programmes, including BEd and PGCE primary and secondary, as well as national and international collaborative programmes.

The BEd degree programme development described in this article was part of a larger project involving four universities, two from the UK and two from Australia, each of which worked independently with partner teacher education institutes in Malaysia. The project was initiated to support the transition of primary school teacher education from a diploma to a degree programme (UNESCO; International Reading Association, 2008).

The BEd Degree Programme

The Program Ijazah Sarjana Muda Pendidikan (PISMP) or BEd degree programme in Primary Mathematics, with English and Health and Physical Education as minor subjects, was written collaboratively by teacher educators in IPKB and IPTI in Malaysia and the University School of Education in the UK. The degree programme was designed to meet the requirements for training Malaysian school teachers to teach in Malaysia. The rationale for the programme was to provide student teachers with the knowledge, understanding and skills necessary to teach mathematics, English, health and physical education through the medium of English within the primary school system. Over the four years colleagues from both countries completed staff development activities; planned the modules; and marked and moderated the student teachers' work in adherence to strict processes designed to ensure accuracy and equity of marking.

Additional rigorous quality and assessment processes were included to ensure that quality, standards and procedures were maintained. All of the Malaysian lecturers (teacher educators) and many of the student teachers were bilingual or multilingual, and together they taught and studied the degree in English. None of the University staff spoke Bahasa Malaysia. Although many of the documents were available in both English and Bahasa Malaysia there was a need for colleagues from the UK to learn some of the relevant terms and for all staff to develop good working relationships.

The student teachers completed twenty-three modules during the programme and acquired relevant knowledge, understanding and skills through a range of settings including learning and teaching activities at the Institute and during placements (practicums) in Malaysian primary schools. Formative and summative assessment took place throughout the programme as the student teachers were supported to become increasingly independent in their learning and professional practice. All 120 student teachers graduated in March 2010.

Developing the Collaborative Approach

Although collaboration is an important element of educational reform (Freeman, 1993), building the collaborative way of working in this project was not easy. The project was initiated by the Ministry of Education, as with most Malaysian educational reforms (Hallinger, 2010) and there were both similarities and differences in the approaches to implementation preferred by senior colleagues from the two countries. For example, members of the UK team were keen to focus on developing a co-created approach to programme development to support impact and sustainability rather than trying to impose their learning and teaching approach onto their counterparts in Malaysia. Shared learning took place as teacher educators from both countries worked together for long days during each visit with a clear focus on project development and team building. The first activity involved each of the two teams presenting their approach to teacher education and identifying strengths and weaknesses of both. Together they undertook a range of practical activities exploring teaching approaches and then wrote module handbooks in mixed UK-Malaysia groups. This intensive, shared working allowed developing understanding of each other's views and this was helped by attempting to maintain established teams so that strong professional relationships developed. Sharing humour and hospitality also supported the lowering of power differentials. For example, the UK team produced a skit for the first end of visit session, in which they made fun of their own difficulties in understanding language and other aspects of culture. This was well received and became an established feature of subsequent visits and shared stories and jokes helped to build relationships. When colleagues from Malaysia and the UK worked together to showcase their ideas at a national conference for Malaysian teacher educators, they concluded with a joint skit in which prior misconceptions of each other were shared in a humorous way. Malaysian hospitality also led to the development of ongoing friendships, and this hospitality was reciprocated when some of the Malaysian teacher educators visited the UK. Together, these shared experiences helped to build relationships which allowed more discussion and critique of approaches than might otherwise have been the case.

Developing, Sharing and Using a New Pedagogical Approach: Action – Reflection – Modelling (ARM)

Developing the ARM Approach

It was agreed at the beginning of the project that the new degree programme should be underpinned by a pedagogical approach that was specific to the Malaysian context and that involved using clearly defined, concise, and readily shared and recalled learning and teaching principles. The principles were seen as important for supporting consistency in approach and understanding for all those engaged in learning and teaching on the programme.

University colleagues had prior experience of collaboratively engaging with teacher educators to develop School of Education-based learning and teaching principles (University of Hertfordshire School of Education, 2006). Drawing on this experience, they recognised the significance of using a participatory approach to development for the subsequent acceptance of the principles and their use in practice. Following a discussion a group of experienced teacher educators within the School of Education selected the terms Action, Reflection, and Modelling (ARM) to represent the principles for the BEd degree programme. These principles were identified with reference to the Ministry of Education Malaysia requirements for the programme, what was known about the philosophy of education in Malaysia from official documents and published research, and the teacher educators' own values and experience. The rationale for selecting each principle is explained below.

Although it was difficult for colleagues in Malaysia and the UK to identify the principles together because of time constraints and the requirements of the Ministry, they worked together to develop a shared understanding and agreement of the principles so that they could be used in practice. Developing this mutual 'ownership' of the ARM approach (Hayes, 1995), and gaining an understanding of different learning and teaching approaches and the value of the experience and educational provision in both countries, were all important aspects of working together.

Action

The word ‘action’ was chosen to represent the principle that learning involves active participation and active learning on the part of the learner. This aligned with the requirements of the Malaysian Ministry of Education that in order to meet global challenges pupils needed to become more active learners rather than passive ones, learning by doing rather than by rote where appropriate. It also met the curriculum specifications for mathematics in primary schools (Ministry of Education Malaysia, 2006) which stated that:

> 'The learning of mathematics at all levels involves more than just the basic acquisition of concepts and skills. It involves, more importantly, an understanding of the underlying mathematical thinking, general strategies of problem solving, communicating mathematically and inculcating positive attitudes towards an appreciation of mathematics as an important and powerful tool in everyday life.' (p. viii)

The 'action' principle was related to the way in which it was recommended both that staff worked with student teachers and that student teachers worked with pupils. Moving pupils from a passive role to one in which they are actively engaged in the learning process has important implications for the role of the teacher as well as the pupils (Vighnarajah, Luan & Bakar, 2008).

Strategies that support active learning include independent inquiry and ways of processing knowledge that involve problem solving, critical approaches and evaluation (Niemi, 2002). These strategies relate to social constructivist approaches to learning and teaching, which are used in teacher education within the School of Education and more broadly in teaching in UK schools. These approaches are based on theories of learning such as those developed by Piaget, Bruner and Vygotsky (Piaget, 1954; Bruner, 1974; Vygotsky, 1978).

Reflection

Seen as important for adult learning, 'critical reflection' (for example, Schön, 1982; Mezirow, 1990; Brookfield, 1995) or reflective learning was chosen as the second principle. The concept of the reflective practitioner was introduced into the college level teacher education curriculum in Malaysia in 1989, although its adoption within programmes was variable and there were complexities associated with a centralised approach to implementation, cultural issues and differences in the meaning of the term reflection itself (Heng & Khim, 2004). Drawing on the literature on reflective practice, these authors have suggested that reflection could be said to have taken place if one of four attributes had occurred that could be used as criteria for reflection, namely: 'examination of practice, reflexivity, a constructive process, and a process of transformation' (Heng & Khim, 2004, p. 12-13). Such transformation might arise from a process of 'critical self-reflection', a process involved in adults' most important learning experiences that can result in '*transformative learning*' (Mezirow, 1990, p 4 and p. 6, emphasis in original).

Reflection is certainly not an easy process. Rodgers (2002), reviewing the work of John Dewey, noted that 'Dewey reminds us that reflection is a complex, rigorous, intellectual, and emotional enterprise that takes time to do well' (p. 844). Critical incidents or critical moments in teaching, which might include both challenging and commonplace incidents have often been used as a focus of reflection (Francis, 1997). Engaging teachers in what Senese (2007) describes as 'non-threatening conversations about their teaching' may contribute to enabling them to develop 'a critical reflective stance' (p. 52). In addition to using reflection in their teaching practice, the student teachers could also apply this when working with children, developing the approach used in some UK schools of encouraging pupils to reflect on their own learning.

Modelling

Modelling was seen as essential for the transition from the approach in which teacher educators told student teachers the theories of practice towards one in which staff explained and then modelled the theories in practice. Loughran (2006) has stressed the importance and value of modelling and suggested that within the context of teacher education it 'means teaching about two things simultaneously; the content under consideration and the teaching employed to convey that content... Modeling then requires teachers of teaching to actively make the tacit explicit' (p. 42). Although modelling was widely used in the School of Education where many of the teacher educators had extensive experience of teaching in primary schools, it was recognised that this principle might be less familiar to the Malaysian teacher educators, many of whom had taught in secondary schools and had different areas of knowledge and expertise.

There were four 'layers' of modelling: modelling by staff to student teachers; modelling by student teachers to enable them to explore and gain practical experience of teaching with the lecturers and their peers in the Institute; modelling by student teachers to pupils in school; and finally modelling by pupils. The idea of modelling in relation to learning and teaching is linked to the concept of the teacher providing a good example for the pupils (Carr, 1993), which is accepted within Malaysian culture.

Sharing the ARM Approach

During the process of sharing and discussing the principles, colleagues from Malaysia and the UK took part in practical sessions and reflection and developed professional relationships that allowed them to challenge ideas and learn from each other. These types of activities took place each time the teacher educators met to plan, mark and moderate the modules, enabling them to deepen their understanding of aspects of learning and teaching and of the ARM approach, and allowing new colleagues to join the group and to contribute to this process. The ARM principles were also explained in all course literature and formed an important component of the work with student teachers. Maintaining this focus allowed a shared understanding across modules and settings and illustrated the importance of identifying the principles underpinning practice and deepening that understanding by using and reflecting on them.

Figure 1 provides a summary of the nature of the involvement of the teacher educators, student teachers and pupils during the stages of developing, sharing and using ARM during the programme. Although this is presented as a linear process, in practice introducing a different approach to learning and teaching in Malaysian teacher education and in primary schools was much more dynamic and complex.

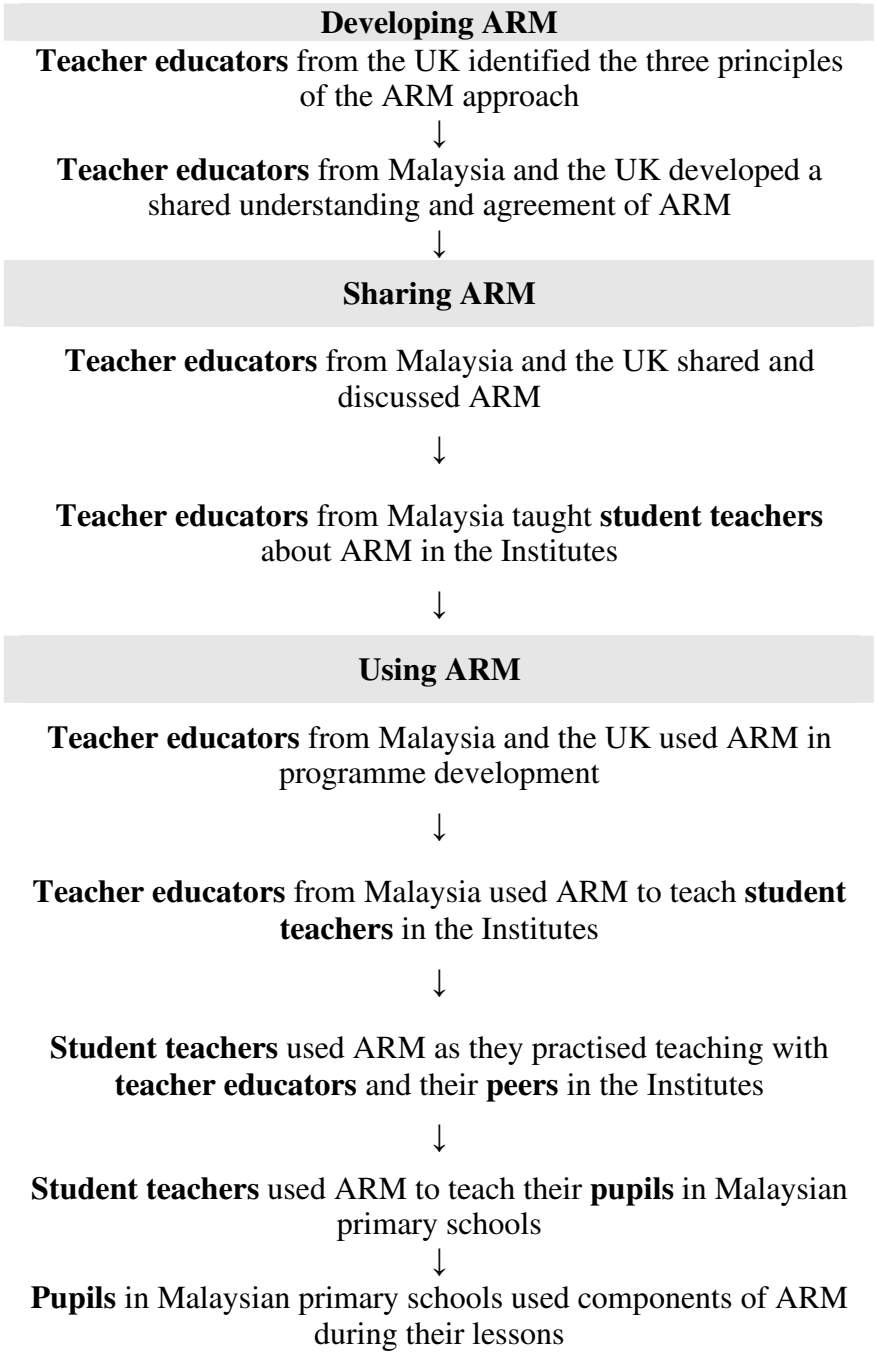

Figure 1. Nature of the involvement of the BEd degree programme participants during the stages of developing, sharing and using the ARM approach

Using the ARM Approach

The three interlinked strands of ARM ran throughout the degree programme and beyond, providing a clear focus for explaining learning and teaching practice, particularly during staff changeover. Sharing and using the approach were iterative processes and it became a 'shared

language' for those engaged on the programme. It was used by the Malaysian and UK teacher educators as they worked together to plan the modules and assessments; by the Malaysian teacher educators as they taught the student teachers; by the student teachers as they practised in the Institutes and then taught in schools; and by some of the pupils in the classroom.

There were some differences in practice and understanding of the approach among the individual participants from both countries. Elements of the approach provided particular challenges, for example, some of the Malaysian lecturers found the concept of 'modelling' at variance with their own experience of teaching.

Research Methods

Aims, Participants and Data Collection

The main aims of the longitudinal research programme were to investigate the views and experiences of participants in relation to the collaborative approach to the project, and to issues relating to learning and teaching. The findings presented in this paper have been selected from those available in the full report of the project (Dickerson et al., 2011) to illustrate, inform, and enable discussion about the process of developing, sharing and using ARM and changing pedagogy in teacher education. The dataset from which the findings are drawn comprises responses collected using face-to-face interviews and self-completion questionnaires (McColl et al, 2001) from more than 180 participants: Malaysian senior managers, teacher educators, student teachers and school mentors. A systematic or purposive sampling approach was used to select some key informants for interview (Mays & Pope, 1995; Pope & Mays, 1995). In contrast each member of the cohort of 120 student teachers was invited to take part. The exact number of respondents is not known because anonymity was maintained for the self-completion questionnaires. Some participants contributed to more than one of the research methods and at more than one stage of the project.

The participant numbers, method and timing of data collection, and areas of interest were as follows:

- *Senior managers.* Four senior managers from Malaysia took part in face-to-face interviews during years 3-4. Their views of the ARM approach were reported in response to questions about collaboration and the nature of working collaboratively with colleagues from the UK. Findings from interviews with senior managers from the UK are not included here.
- *Teacher educators.* At the end of year 3, twenty-three teacher educators from IPKB and IPTI in Malaysia completed questionnaires; and eight teacher educators, four from each of the Institutes took part in face-to-face interviews. Respondents provided feedback on their experience of using action, reflection and modelling and the ARM approach, and their reflections on other issues relating to learning and teaching. Some of the teacher educators refer to 'lecturers' in their responses and these terms are used interchangeably.
- *Student teachers.* Student teachers on the programme completed questionnaires at the end of their first and final placements. In total, 110 of the 120 students took part in the survey during the second year and 87 students contributed during the fourth year (response rates, 92% and 73% respectively). They reported their views and experience of using ARM and their learning from the approach. The terms 'student teacher' and 'student' are used to refer to members of this cohort. The pupils they taught in primary school, aged from seven to twelve years, are referred to as pupils or children.

- *School mentors.* Forty-seven school mentors completed questionnaires during the student teachers' final placement (year 4) and gave their views of any differences between the classroom teaching of the BEd degree student teachers and the teaching of previous students.

Most of the survey questions were open-ended, giving rise to qualitative data in line with the aims of the study, which emphasised the views and experiences of all the contributors (Pope & Mays, 1995). Using open-ended questions enables participants' views to be recorded without using previously selected categories, although in the case of written responses there are associated limitations, for example, those relating to respondents' writing skills, the effort needed to respond and the inability to follow-up on responses (Patton, 2002). Selected responses from the questions shown in Appendix 1 are included in this paper.

The 'core' project research team included senior colleagues in Malaysia engaged in BEd degree programme development and management; and colleagues from the University School of Education. These were the Head of International Development in the School, who was the Programme Director for the BEd Primary Mathematics (Malaysia); and the Head of Professional Learning and Development and a research fellow who were not involved in programme development. University project team members were responsible for the day-to-day management of the research process and consulted with senior colleagues in Malaysia as required. The self-completion questionnaires were administered and collected by colleagues in Malaysia. The face-to-face interviews with senior managers and teacher educators were carried out by the research fellow who took comprehensive notes during the interviews but did not tape-record the sessions.

Data Management and Analysis

Data management and analysis were coordinated by the research fellow who consulted with members of the core project research team and other researchers and teacher educators within the School of Education with extensive experience of the project. Together these two groups formed an 'advisory' team.

The research fellow transcribed the survey responses from the completed hand written questionnaires and interview notes to provide typed data texts for analysis, and verified these texts against the source documents, if necessary in consultation with a member of the advisory team. The hand written responses were provided in English; a few responses from school mentors had been translated prior to submission. A small number of spellings and abbreviations were standardised in the final data texts. The process of transcription provided the research fellow with an opportunity to become familiar with the data (Patton, 2002). The complete set of data texts from the study comprised more than 1500 individual question responses, providing very rich and extensive sources for analysis.

Although data are reported in this paper as verbatim quotations of individual survey responses, most of the research data were also content analysed. A detailed account of the process used to content analyse some of the student teachers' responses will be published elsewhere.

Research Findings

Data are reported as individual responses to the surveys together with a brief commentary highlighting selected features of interest, some of which are referred to again in the discussion

section. The responses are illustrative and are used to show the richness and complexity of the data. They are set out according to the respondent group in four main sections, with sub-sections.

Responses from Senior Managers

Collaborative Programme Development

The senior managers were asked about the nature of the working relationships between the partners in the project in a series of questions about the collaboration starting with: 'Has the collaboration changed/developed since it started? If yes, how has it changed/ developed?' During these discussions one interviewee referred to the emphasis on pedagogy within the programme, the newness of ARM, and the learning for both staff and students. This participant also referred to the wider impact of the programme on school communities.

> '...The programme has brought us some new ideas in teaching and learning especially in what UH has supplied, especially ARM. ARM is a very good tool. ARM is carried out throughout the 4 year BEd programme...'

This interviewee shared the following view in response to the follow-up question 'What is the nature of the collaboration now?'

> '...The programme has brought us some new vision. We work on this first batch of BEd programme and this BEd is something very new and we can see the difference between our BEd programme and the programme we normally have. Very obvious when the placement school say they prefer the BEd students – more updated and make the teaching and learning in the classroom different and enjoyable. BEd students being asked by the teachers in school what they are getting from the programme. They are asking for a course for the teachers in the school. Can help the schools so much especially if we can introduce them to ARMs in the programme – what the students have been doing in the placement.'

The same senior manager gave the following feedback when asked 'What has promoted collaboration?'

> 'Lot of factors. 1) Initiated by the Training Division. 2) So much that we can learn from this programme. Day to day this programme has new things for us to know especially when we have the module. Maths – not just to teach numbers but "how to teach numbers". In this programme a lot of "how to teach" is being carried out. So we have to model to the students. Initially very little modelling being carried out. With the ARM we know we have to carry that out in the lecture before the students can do it in the classroom. In the school the students are clear to do in the classroom. It promotes the programme. 3) How our students learn through the reflective mode. Asked to reflect on the learning and teaching. Learn through reflection more than they can through the other sources.'

Professional Benefits from Collaborative Programme Development

Two Malaysian senior managers' responses to the question 'What are the professional benefits to you of the collaboration? What have you got out of it?' suggest differences in their pedagogical approach prior to the BEd degree programme. The first interviewee refers to the newness of ARM, acknowledging its origin and describing it as a 'solid foundation', a 'guide' for the staff and a 'good tool' for the students and lecturers, whereas the second respondent suggests that the introduction of ARM had endorsed and consolidated their previous practice, making it more widely accepted and used.

> '...Teaching and learning. For teaching and learning when we start the programme, the first Induction course, UH came with a solid foundation – ARMs to guide us through the programme. We were fascinated that ARMs can bring something new. We understand ARMs better and better and see it as a good tool for the students and lecturers. The successfulness of ARMs being carried out...'
> 'Professionally, before was teaching local post-graduate programme. Started to use a lot of high level questioning techniques, more student centred approach. Try to use this to become more efficient. Later the ARM model, very similar to what I was practising before. Before I was singing alone, but now I am singing in a choir. Now very comfortable because everyone is doing the same thing.'

Responses from Lecturers

Previous Experience of Using Action, Reflection and Modelling

Although the Malaysian lecturers were not asked about their prior experience of using the ARM principles in the self-completion questionnaire some respondents referred to this in their responses. For example, when asked 'In what ways do you use ARM on other programmes? Please give as many examples as possible', one responded:

> 'I used action learning and reflection strategies a lot in my classes. Modelling is used when I teach methodology. These strategies are routine. They had been applied long before ARM was introduced.'

As a result of these reports, the lecturers were asked 'Which aspects of ARM were you using before the BEd degree with the University of Hertfordshire?' during the interviews. Although this was challenging in terms of recalling practice more than two years earlier six respondents confirmed that they had used action, reflection and modelling prior to starting the programme. One lecturer expressed it in the following way, highlighting the need for flexibility, adapting learning and teaching approaches to the student teachers' needs.

> 'More or less we have been doing the same thing (three components)...Before we catered for different groups of students, for example, older students, students coming into a degree. Students here are fresh from school so they are a bit young. So that the teaching has to come in approaches dependent on the students.'

Experience of Using ARM

The lecturers' experience of using ARM in teaching was explored in more detail during the interviews. Their responses illustrate how they had taught using ARM and how they had taught ARM to their students, focusing on 'how to teach', a particular feature of the programme highlighted by one of the Malaysian senior managers.

One lecturer's response to the question 'How do you teach using ARM? Could you give me an actual example of how you have taught using ARM?' given below, demonstrates a complex multiplicity of roles for both lecturer and student teachers. The teacher education setting provides a variety of such opportunities for interaction and exchange (van Huizen, van Oers & Wubbels, 2005). In this example, the lecturer starts as both an educator of student teachers and a 'teacher', modelling the role the student teachers might adopt in the classroom, as s/he explains and models the activities and asks the students to reflect on them. The focus for this reflection is teacher education; how the students could adapt the activity for different pupils, the 'how are we going to

teach', which at this point suggests a shared role. The students are student teachers and 'pupils' as they learn about teaching and experience what it might be like in the classroom but also gain insight as 'teachers' as they identify how they will teach their pupils.

> ‘To carry out an activity...a brief explanation of how to carry out the activities. So I model how to carry out the activities then the students do the activities on their own in small groups. After the activity I ask them to reflect on the activity and ask them how they will use the same game for higher level or lower level students – how are we going to teach. So they have to reflect and then they give suggestions.’

Responding to the question 'How do you teach ARM to your students? Again, could you give me an actual example of how you have taught ARM to your students?' two other interviewees explained how the student teachers prepare for and carry out teaching.

> ‘...I ask them to prepare an activity and ask where is the action, the reflection and the modelling part. It happens in all topics we discuss with them throughout the session.’ [Refer to the previous question]. ‘After the session we do the whole class reflection and they get to know what the whole ARM looks like. Also sometimes they do some micro-teaching and we discuss about the implementation of ARM in that session.’

Adapting ARM

Although the ARM principles were promoted to provide consistency in learning and teaching approach across different participants and throughout the duration of the degree programme, it was recognised that lecturers might adapt the approach for particular settings. They were therefore asked 'Have you changed any aspects of ARM to make it appropriate for your context or setting? If yes, please specify which aspects you have changed.' The three responses below illustrate the spectrum of views and practice within this small cohort. The first interviewee suggested that they felt confined by the ARM approach; the second explained that they adapted it to meet time constraints; and the third felt affirmed in their practice and tried to extend its use into other programmes. Endorsing the reports of other participants of using the previously 'unnamed' ARM, this interviewee felt supported and encouraged by taking part in the programme.

> ‘At times I feel the ARMs is too rigid...’
>
> ‘In a way, yes. If I don’t have the time then I will start the activities in class and ask them to go back to finish the activities and later on they would report on their reflection. Apart from the BEd programme we might not have enough time to engage the students in this manner.’
>
> ‘Before I get to know this UH programme I have already started only I don’t have enough support materials and actual and more practical models or way to do it. So I doing it, I was trying but not very confident. So when I was exposed to the UH programme I was very happy because this is really what I want. The UH programme really gave me a lot of practical way [to implement] and to consolidate my beliefs in my practice and my teaching. Before I didn’t really know the name to give it although I was doing. Actually try to incorporate the ARM into other programmes.’

Changing Pedagogy in Teacher Education

This section includes responses that refer to changes in learning and teaching arising from the degree programme, and in particular from using ARM. These changes and the challenges associated with them are important themes explored in this article, derived in part from one of the Ministry of Education Malaysia priorities for the project. The first three responses are taken from the lecturers' feedback to the following question in the self-completion questionnaire 'Has your view of effective teaching changed during your involvement on the BEd? If yes, how?' The second respondent refers to involving peers in learning and to the application of theory to 'real-life' situations.

> 'I used to ask lots of "How" and "Why" questions in my class. During my involvement on the BEd, I have added the element of modelling in my session.'
>
> 'Definitely, this is true especially for pedagogy courses where I used ARM in order to engage them.
>
> • 'As a lecturer, I have to design lectures involving hands-on activities such as making resources, asking them to present their Product and then to reflect & improve using their friends' responses. Trainees have to come up with creative approaches to teach students.
>
> • 'For mathematics courses. Based on content (pure mathematics) – we have to find instances where the theories are applied in the real world. Projects can be designed to do just that.'
>
> 'Yes. I believe that active learning approach is a better alternative for effective teaching. I try to incorporate it in my teaching and I find that it does produce better result in learning process.'

Two of the lecturers explained how they had changed their practice in response to the interview question 'What do you do more of in your teaching since the start of the BEd degree (with the University of Hertfordshire), if anything?' One interviewee reported that they were using the Japanese lesson study approach to professional development (Saito, 2012), personalising the sessions by drawing on the teachers' 'own experience' and once again peer learning is noted. The second interviewee's experience of group work caused him/her to question previous assumptions about student behaviour (Cobb, Wood & Yackel, 1990).

> 'I combine some of the ARMs with the other things – one of the things I usually use – the reflection part is there. Start with the problem and ask the participants to reflect on the problems.
>
> [Doing a workshop]. 'Approach is less talk, less lecture, more the participant doing it on their own. Teachers have their own experience. I use their experience in the session so that it becomes active and participative. I find more – I ask them to model it for their friends rather than me do the modelling. Concept of 'lesson study' Japanese model of teaching and learning. Teachers observe other teachers – consider it as modelling.'
>
> 'I have changed a lot. I have more modelling, more action, students do hands-on activities a lot. In fact the students plan for suitable activities to be carried out in schools and during the seminar we have micro-teaching. During the planning for every seminar we have micro-teaching so they will carry out in groups at the same time. At first I thought will my students do the activities – they present in their small groups. I underestimate them, I thought they would play. I have to move from one group to another group but they did that. Together with the reflection of the teaching and questioning of their peers. So when I move from one group to another group they will give feedback, which is good. So more student participation. Normal practice – only one group present and everybody will observe. For other programme also I did like this. I use ARM for another programme.'

Designing a Future BEd Degree

Finally, the eight lecturers who were interviewed shared some insights into their hopes for the design of a future degree programme in Malaysia when they were asked 'If you were asked to write your own BEd degree in the future, what would it look like? (Please consider for example, approaches, principles, values).' In the following example, one lecturer drew on their experience of the traditional curriculum and this collaborative project, and suggested that elements of both could be integrated to enrich the new programme.

> 'I think the UH programme is very good. Only one thing I think the best one is the combination of our traditional curriculum and the UH programme. Because to me our traditional programme is more of a content based programme and, of course, the UH programme is more the ARM approach but there are some weakness there. To certain extent it depends on the lecturers and also the students' attitude. If the attitude is not positive enough – sometimes when they are doing something active they don't learn much. The resources and the references suggested to the students is very important so that the students really learn something by doing something. Sometimes the students participate in the active learning process but if they are not really guided they don't learn much.'

3. Responses from Student Teachers

Experience of Using ARM

The student teachers described how they had used the elements of ARM in the classroom during their placements. The first two examples below were made in response to the question 'How did you use ARM on your [first] placement?' Individual students structured their response in one of three ways: as an integrated approach as they used ARM in practice (as one of the lecturers expressed it 'they get to know what the whole ARM looks like'); as an account of their use of each principle in the sequence of the acronym; or using a unique structure of their own. In the examples below the focus is constantly alternating between the student teacher and the pupils, illustrating the dynamic situation in the classroom, and the students voice their awareness of the centrality of learning by pupils. Goh and Matthews (2011) identified 'student learning' (p. 96) as one of four main themes that emerged from their analysis of Malaysian student teachers' reflective journals documented during placement in secondary schools. These authors further sub-divided the themes into concerns, which included concerns about pupils' understanding of the content, an emphasis also reported by some of the students in the study reported here. For example, in year 4 one of the students explained 'When the pupils seem not understand the day's lesson, another same L.O lesson will be carried out but in different way'.

Also in year 4, one of the student teachers described how they had introduced action in order 'to make my class active/promote active learning'. They used different strategies and resources, including ICT, creative activities and group work, and engaged some of the pupils in new roles as 'teachers' or 'ambassadors' so that they could help their peers. Involving the pupils in this way 'as resources' and engaging them in creative activities, such as the song writing described in the last example below, suggest that the students were using forms of 'higher level instructional issues' described by Wilson and Cameron (1996, p. 186). The student teachers reported reflecting on their teaching and on the pupils' learning, either on their own or in dialogue with their mentor or teacher educator; and on pupil reflection on their learning and understanding.

Modelling was carried out through demonstrating skills (collaborating), and providing examples (content knowledge), and typically in the Malaysian context by providing a role model for pupils.

> 'I used the three elements of ARM namely action, reflection, modelling in daily teaching. For example, I acted as a listener who paid attention to the pupils' explanations, sometimes as a guide who helped them to identify and solve their problems. After each lesson, I reflected on my strengths and areas of development. Also, I tried to find improvement and made efforts to realise it in my following lessons. Regarding modelling, I used different types of teaching aids based on the learning objectives which I have set. I would show and asked open questions whenever I used a particular teaching aid. Wait time was given so that the pupils were able to think and learn through the teaching aids provided.'
>
> 'I try to create an environment which they feel relaxed and comfortable with. I bring a lot of joy in my teaching, whereby they are interest in learning something from my teaching. I treated the child friendly and appreciate their opinions. After each lesson, I will reflect on what I can do to improve my teaching in future.'

The following four responses to the question 'How did you use ARM on your final placement?' were documented in year 4.

> 'Action: I used various strategies which I have learnt from this course and also tried out some new strategies/activities both in the classroom and in the field. For example, incorporated dance in the PE lesson, conducted "Formation of Fractions" with the pupils.
>
> 'Reflection: I did reflection in the end of every lesson. This had greatly helped me to understand my strengths and areas for development. In addition, I had discussion with my mentor and lecturer in order to get deeper insights on my teaching.
>
> 'Modelling: I demonstrated some skills such as collaborating with each other in my teaching. For instance, I assigned some pupils as the "ambassadors" to help their peers in other groups with my monitoring.'
>
> 'A – I used several resources including ICT to make my class active/promote active learning.
>
> 'R – reflect own teaching and let the students to reflect on their own for learning.
>
> 'M – being a good model to my pupils.'
>
> 'A – I used a lot of group activities as it promoted pupils' talk. I also assigned some "little teachers". They helped me a lot in handling the weak pupils. I also can evaluate their understanding through their explanation.
>
> 'R – After each lesson, I did reflection on my area of development in teaching and children's learning. When the pupils seem not understand the day's lesson, another same L.O lesson will be carried out but in different way.
>
> 'M – Each and every "new" knowledge need to be modelled to the pupils. This always came with "examples". Besides content knowledge, I did also model good behaviour.'
>
> 'I used ARM during the lesson. I made the pupils to create their own song for a topic called percentage. The pupils were very happy as they worked in groups to create the song. Then the pupils would have to reflect on the effectiveness of the song and how much do they understand about the topic. Finally I had guide the pupils to sing the song in the whole classroom.'

Learning from Using ARM

The student teachers' experience of teaching during their school placements took place at the beginning of their teaching career; and at the end of their first and final placements the students were asked to consider 'What have you learned from using ARM that will influence your practice as a teacher?' The following responses provide examples of their learning during their first placement. In the last example, a student reports trying to look at their teaching from the pupils' point of view.

> 'From my experience, I think the practice of ARM concept can stimulate the interest, generate the ideas for both parties, pupils and teacher. I strongly recommended the usage of ARM concept for all teachers around the world.'
>
> 'I can use variety of teaching aids or resource that can help my pupils' learning according to their needs. Besides, I also can promote pupils-centered while teaching so that they can enjoy the learning and activity session. I also can get feedback from my pupils and from here I can improve myself. Lastly, I have confident in front of class and while modelling through what have I learned from using ARM.'
>
> 'I like ARM. Simple and effective. I teach, I identify what learner's know, I reflect, set the future actions and try it in my next lesson, show good demonstration and modelling them.'
>
> 'I found that ARM promotes close interaction between teacher and children in the class. It influences me to further my teaching by encouraging reflection on children's learning. I realise that active learning will be practised well when reflection and enhancing modelling are done by the teacher.'
>
> 'I know that pupils' reflections are vital as I can understand the obstacles that they faced. From there, I can modify my lesson which totally suit their 'styles'.'

Some examples of the learning described by the student teachers at the end of their final placement are provided below.

> 'From the model, I do believe that pupils will love a lesson which has practical work and active participation. Therefore, these element should be included in every lesson.'
>
> 'Reflection is very helpful as I can get students' feedback & try to suit my teaching style with students' needs. And of course the modelling is important as it can extend their understanding.'
>
> 'When pupils reflect, I know what pupils learnt through my lesson.'
>
> 'Active learning is an important things that I must remember. Reflection is to improve our quality of teaching. Modelling is to show the proper way of doing something. It is simple but do make me remember easily. I even design my own principle "LEG" to match and strengthen my principles. L – Love – an element that almost all of us forget. E – Enthusiasm – the spirit and energy we should have. G – Go for it! – Go for everything that you think is good for your pupils' learning, I hope I am able to be an excellent teacher!'

Responses from School Mentors

The student teachers provided insightful and often vibrant accounts of the way they had used action, reflection and modelling in the classroom. Their reports were supported by many of the school mentors who responded to the following question during the students' final placement: 'Is the classroom teaching of the BEd students different from previous students?' The response options were: 'Yes; No. If YES, please give 3 ways in which the teaching of these BEd students is different from the teaching of previous students.' Some of the mentors reported that they had

observed elements of active learning consistent with the curriculum specifications for mathematics in primary schools (Ministry of Education Malaysia, 2006).

> 'More confident; active learning; varieties of teaching strategies.'
> 'Teaching matches exactly with the lesson plan; very interesting teaching & learning.' [response translated]
> 'Teaching is more of inquiry discovery nature.' [response translated]
> 'They use a lot of concrete materials to build visual concept for the pupils; they always use or prepared group work/group task (active lessons); good communication and explanation to the pupils.'
> 'Teaching strategies are very systematic and many creative ideas; good relationship with the students; always involve activities that relate to students' experience in real life situation.'

Discussion

Collaborative Programme Development

The development of the BEd degree programme was characterised by many of the features of collaboration; a process in which all partners make important and unique contributions, derive benefit, and recognise their mutual dependence for reaching the results (Freeman, 1993) and in addition share responsibility, authority and accountability (Mattessich & Monsey, 1992). Although there were elements of 'contrived collegiality' as discussed by Hargreaves and Dawe (1990, p. 227), the collaborative nature of the engagement between colleagues from the Institutes and those from the University was seen as an important feature of the project (Warren & Rawlings, 2010). There was a requirement to work together at the beginning of the project, but 'what began as contrived meetings... evolved into spaces for more genuine collaborative activity wherein teachers challenged each other, raised questions, and shared ideas for teaching' (Datnow, 2011, p. 156). From the Vygotskian viewpoint the context of teacher education provides a wealth of formal and informal settings in which meanings of learning and teaching can be developed, tested and negotiated and 'shared meanings' can be developed 'as a mark of in-group membership and solidarity'(van Huizen et al, 2005, p. 280).

The international setting for the project added a complex dimension that meant particular attention had to be given to adopting a critical, reflective approach to the process, and considering issues of power and voice (Atweh & Clarkson, 2002). Such 'Collaborations should be based on mutual respect and trust in the ability of the different partners to contribute different types of learning to the collaborative enterprise' (Atweh & Clarkson, 2002, p. 107). Collaborators can enhance their decision making and problem solving skills through working together (Freeman, 1993) and some of the Malaysian colleagues affirmed this approach in their responses to the surveys; this was also evidenced by their increasing confidence in adapting and developing the degree programme. By working together to develop, share and use ARM the teacher educators in this project modelled a collaborative approach to developing teacher education.

The New Pedagogical Approach

The ARM approach was designed to move the focus of learning and teaching, where appropriate, from one of rote learning in which the teacher (teacher educator or student teacher) played a central role and took responsibility for the transmission of knowledge and for pupils' learning, towards one in which the pupils themselves were centre stage, active in learning by doing, constructing and re-shaping knowledge and gaining understanding. This change applied both to the student teachers in the Institutes and to the pupils in schools. Some of the student teachers' enthusiastic accounts of their use of ARM in school, their learning from this, and the pupils' responses to this learning approach suggest that the purpose of ARM was achieved in some classrooms. The following two responses imply that the teaching approaches used were based on the needs of the pupils. The first example, recorded at the end of the first placement, suggests that the student teacher is confident and the pupils 'can enjoy the learning' and can provide feedback for the teacher's development. Although the role of the teacher is more dominant in this example, the second account, which describes a mathematics lesson reported at the end of the final placement, switches emphasis from the teacher (who instigated a creative activity) to the pupils (who were happy and engaged in groups and then reflected on their understanding), and back to the teacher (who 'guided' the pupils at the end of the session). In their study of the perceptions of student teachers across three year groups in Australia, Wilson and Cameron (1996, p. 187) noted a move 'from a teacher centred, egocentric perspective' in the first year to a 'more pupil-centred' view in the final year. Such a trend, if it exists with this cohort, would be more easily demonstrated by following individual students over time, and cannot be suggested from the selected examples reported here.

> 'I can use variety of teaching aids or resource that can help my pupils' learning according to their needs. Besides, I also can promote pupils-centered while teaching so that they can enjoy the learning and activity session. I also can get feedback from my pupils and from here I can improve myself. Lastly, I have confident in front of class and while modelling through what have I learned from using ARM.'
>
> 'I used ARM during the lesson. I made the pupils to create their own song for a topic called percentage. The pupils were very happy as they worked in groups to create the song. Then the pupils would have to reflect on the effectiveness of the song and how much do they understand about the topic. Finally I had guide the pupils to sing the song in the whole classroom.'

The ARM approach, used as described by the student teachers in these examples, was aligned with the curriculum specifications for mathematics in primary schools, which emphasised components of active learning, including understanding of underlying principles and problem solving (Ministry of Education Malaysia, 2006). It also reflected many of what Lim (2006, p. 210) described as 'characteristics of a good lesson or good practices' in mathematics teaching. From their experience of using ARM the students suggested that it could 'stimulate the interest, generate the ideas for both parties, pupils and teacher' and 'promotes close interaction between teacher and children in the class'.

Loughran (2002) has stressed the importance of learning from reflection in developing the practice of teaching, and encouraging the student teachers to reflect on their learning was an important part of the ARM approach. This had implications for supervisory staff during school placements who needed to allow the students to take greater control and responsibility for their own learning (Heng & Khim, 2004) as well as for the teacher educators who were required to explain and model the process. In turn, the responsibility was passed to the student teachers who took on the challenges of reflecting on their own teaching and learning; of explaining and

modelling reflection to their pupils as they sought to engage them in the reflective process; and of allowing their pupils the space to do so. Pupil feedback as a result of reflection, part of the pupil centred approach, was valued as an opportunity for teacher improvement ('I also can get feedback from my pupils and from here I can improve myself' and 'Reflection is very helpful as I can get students' feedback & try to suit my teaching style with students' needs'). Managing both their own reflection as student teachers and the individual reflection of multiple pupils within the class would have been complex (Le Cornu & Peters, 2005), particularly as the reflective process was almost certainly new for all the participants.

The three principles integral to the ARM approach were repeatedly made explicit to the practitioners on the new degree programme. It is important for teacher educators to reveal the principles of their teaching practice in this way to themselves and to their students especially if their practice is to influence student teachers' own practice development (Loughran, 2006). As Crowe and Berry (2007) assert:

> 'Our principles represent a conceptualization of the knowledge of practice of teacher education developed through our personal experiences of teaching prospective teachers and through ongoing efforts to derive meaning from these experiences. While the particular ways in which we enact these principles may be context- and individual-specific, they represent a big-picture view of what matters in our teaching about teaching...' (p. 33)

The clarity of the presentation of the ARM principles was implicit in many of the student teachers' reports and by the end of the final placement one member of the cohort had constructed their own approach:

> '...I even design my own principle "LEG" to match and strengthen my principles. L – Love – an element that almost all of us forget. E – Enthusiasm – the spirit and energy we should have. G – Go for it! – Go for everything that you think is good for your pupils' learning, I hope I am able to be an excellent teacher!'

Several of the student teachers referred to emotional aspects of their teaching, and the inclusion of emotional principles in the excerpt above suggests that this developing teacher had recognised that '...Good teachers are not just well-oiled machines. They are emotional, passionate beings who connect with their students and fill their work and their classes with pleasure, creativity, challenge and joy...' (Hargreaves, 1998, p. 835).

Changing Pedagogy in Teacher Education

At one level, there is much overlap between the obstacles to educational reform faced in Asian and Western cultures (Hallinger, 2010). Although resistance to change might be passive, it can be greater in settings where questioning is not open, for example, where there is high respect for authority and a top-down approach to implementation. However, conversely, if the appropriate groups in collectivist societies can be engaged in change, the momentum can be greater than that in individualistic ones (Hallinger, 2010). Introducing a new pedagogy into the curriculum at national level, such as the example of the primary mathematics curriculum cited here (Ministry of Education Malaysia, 2006) does not translate readily into a change in practice in schools (Morris, 1985; Ali, 2007). Morris (1985) identified several reasons why teachers in Hong Kong secondary schools did not change their teaching practice in line with curriculum documents. Some of these reasons overlap with those put forward more recently by Lim (2006), who suggested that moving towards using more student-centred approaches to teaching in mathematics is constrained by time pressure; teachers' beliefs that explaining clearly to pupils is more efficient than allowing them to explore on their own; the focus on examinations; and the

common perception that working hard and practising are essential for successful mathematics learning. Implementing constructivism in the classroom is particularly complex. Framed by Windschitl (2002) as a series of four dilemmas (conceptual, pedagogical, cultural and political) associated with the teacher's understanding of the underlying concepts; the need for more complex approaches to developing learning experiences; changing roles and expectations for both teacher and pupils in the classroom; and resistance from members of the school community. National and local school-based cultural norms and practices are important and constructivist principles, such as those suggested in the Malaysian curriculum embrace a meaning of learning and teaching that is often opposed to the traditional approach used in Asian schools (Hallinger, 2004). Greater understanding of the mechanisms at work in school settings and teachers' decision-making processes are likely to be important bases of effective strategies for change (Doyle & Ponder, 1977).

There are obstacles associated with educational reform (Hallinger, 2010), and there were some inherent tensions within the current project in which the UK teacher educators were engaged to contribute to bringing about change in Malaysian learning and teaching practices. Some of these tensions were explored as colleagues from both countries critiqued each other's pedagogical approaches when working together to develop the programme, and documented as part of the research programme. For example, although combining the three principles of action, reflection and modelling into a single, coherent, and explicit approach was new, some of the Malaysian teacher educators reported that they had been using the principles prior to the project. One lecturer described using the strategies as 'routine' and continued 'They had been applied long before ARM was introduced' and most of the lecturers interviewed confirmed that they had been using all three components prior to the project. There are several explanations for these reports, which are consistent with the programme development approach. It was acknowledged earlier in this article, that there is wide variation in teacher educators' practice in both Malaysia and the UK with overlap between them. Every experienced teacher has an extensive repertoire of teaching and learning strategies and whilst more widely used or 'traditional' approaches might have dominated during the group discussions, or indeed some respondents might not have been part of the group, their responses to the survey could be based on their personal preference and spectrum of practice. There might also have been early differences in understanding of the terminology between the Malaysian and UK teacher educators; for example, 'modelling' might initially sound different or 'new' to an experienced former secondary teacher in Malaysia. However, if it is associated, as Desforges (1995) suggests with demonstrating, showing or telling as a means of direct instruction then it is clearly part of an educator's 'routine' practice. There were also some differences in emphasis between respondents. One senior manager recalled that they had started to use a more 'student centred approach', which was similar to the ARM approach but saw this as unusual and valued the wider use of the new approach as a result of the project ('Before I was singing alone, but now I am singing in a choir. Now very comfortable because everyone is doing the same thing'). This feedback is supported by Hallinger (2010) in his study of 'Asian' approaches to educational reform. He confirms that student centred approaches to learning are less well-known to teachers in that region, and reports one respondent from Thailand who observed that such 'English terms' as 'student centred learning' did not have local equivalents and were open to different interpretations and confusion (Hallinger 2010, p. 412).

Whilst not referring explicitly to the nature of the difference between ARM and their former practice, a second manager referred to 'some new ideas in teaching and learning...especially ARM' and reported that the student teachers were seen to be introducing a different approach to

learning and teaching in school ('Very obvious when the placement school say they prefer the BEd students – more updated and make the teaching and learning in the classroom different and enjoyable'). The student teachers perceptions of the benefits and challenges of using this new approach in the classroom are explored in greater detail elsewhere.

Strengths and Limitations

The research findings provide valuable insights into the views and experiences of senior managers, lecturers, student teachers and school mentors in Malaysian teacher education and primary schools. The quality, depth, variety and longitudinal nature of the data sources enable some triangulation, adding to the validity of the findings. However, the data should be interpreted within the context of an international study of complex issues in the practice of learning and teaching, and the limitations of the research methods. These limitations include those common to the collection of data using self-completion questionnaires and interviews, for example, some responses were dependent on respondents' recall and respondents to the questionnaire were self-selecting. The student teachers and school mentors gave valuable insight into teaching in the classroom; feedback from the pupils would also have been of interest.

Implications for Practice

Throughout this project the teacher educators from Malaysia and the UK demonstrated that teachers are also learners as they entered a 'learning partnership' with their peers in which they were 'learning *from* and *with* each other' (Le Cornu & Peters, 2005, p. 61 emphasis in original) and developed 'the social contexts' together within which this learning could take place (Cobb et al, 1990, p. 145). They engaged in dialogue about their professional practice and learnt about the personal, professional and cultural values and beliefs that shaped the pedagogies of both parties and of the individual practitioners. This professional dialogue including 'everyday conversation' (Haigh, 2005, p. 3) or '"learningful" conversations' in which individuals must be able to reflect on their thinking (Senge, 1994, p. 19), have potential for professional learning. Williams, Prestage and Bedward (2001) also emphasise the value of discussion with other professionals as a means of development, in the context of unplanned collaboration. Critical conversations about practice with colleagues can form an important component of critical reflection, which can become a shared activity, enabling educators to review and broaden their theories of practice (Brookfield, 1998). Arguing against the suggestion of a linear causal relationship between beliefs and practices, Cobb et al (1990) suggest that they are interdependent and develop together. The sharing of beliefs across cultural settings between teacher education programmes in order to learn more about personal beliefs and enhance understanding of different views is also thought to be of value for student teachers (He, Levin, & Li, 2011).

One of the Malaysian senior managers highlighted the emphasis on pedagogy ('In this programme a lot of "how to teach" is being carried out') and one of the implications of this project for the practice of teachers and teacher educators is the value of articulating pedagogy as a means of developing practice. This endorses the views of others with expertise in this area who stress the importance of making pedagogies explicit in teacher education (for example, Kosnik, 2007).

The benefits of articulating pedagogical approaches whilst engaging in this project were eloquently expressed by a very experienced teacher educator from the University who documented this reflection on the professional and personal benefits of taking part.

> '...the most unexpected advantage for me resulted from needing to articulate the rationale for ARM: active learning, reflection and modelling. Having to explain why ARM was being recommended as an approach to teaching and learning involved us in on-going discussion and debate as we questioned many existing opinions and assumptions. I rather naively expected this to be complete at the start of the project but it remained a constant feature throughout. Of course this was vital in order to validate and showcase our practice – and then to be able to present our ideas in a way which would influence and persuade others. Experienced practitioners are rarely required to outline their pedagogy – indeed their approaches to teaching and learning can often appear as second nature, in skillfully habituated and automatic routines. Because of this, the need to put ARM into words was revealing and informative; and only achieved through the professional support of colleagues, collaborating with and learning from each other as ideas took shape. Thus the process became an illuminating obligation which confirmed and extended my practice...' (Dickerson et al., 2011, p. 150)

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Appendix 1
Survey questions

Questions for senior managers

- Has the collaboration changed/developed since it started? If yes, how has it changed/developed?
- What is the nature of the collaboration now? (or How do you see the collaboration now?)
- What has promoted collaboration?
  What are the professional benefits to you of the collaboration? What have you got out of it?

Questions for teacher educators

Interviews

The first question in the interviews was prefaced as follows: As you know, the BEd degree with the University of Hertfordshire is supported by the ARM approach to teaching and learning: Active learning, Reflection on learning and practice, and Modelling by the teacher to support learning.

- Which aspects of ARM were you using before the BEd degree with the University of Hertfordshire?
- How do you teach using ARM? Could you give me an actual example of how you have taught using ARM?
- How do you teach ARM to your students? Again, could you give me an actual example of how you have taught ARM to your students?
- Have you changed any aspects of ARM to make it appropriate for your context or setting? If yes, please specify which aspects you have changed.
- Has your view of effective teaching and learning changed during your involvement on the BEd degree? If yes, please specify how your view has changed.
- What do you do more of in your teaching since the start of the BEd degree (with the University of Hertfordshire), if anything?
- If you were asked to write your own BEd degree in the future, what would it look like? (Please consider for example, approaches, principles, values.)

Self-completion questionnaires

- In what ways do you use ARM on other programmes? Please give as many examples as possible.
  Has your view of effective teaching changed during your involvement on the BEd? If 'yes', how?

Questions for student teachers

- How did you use ARM on your [first] placement?
- How did you use ARM on your final placement?
- What have you learned from using ARM that will influence your practice as a teacher?

Question for school mentors

Is the classroom teaching of the BEd students different from previous students? Response options: Yes; No. If YES, please give 3 ways in which the teaching of these BEd students is different from the teaching of previous students.