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Using action, reflection and modelling (ARM) in Malaysian primary schools: connecting 'the ARM theory' with student teachers' reported practice

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Abstract

This article presents Malaysian student teachers' reports of using an action, reflection and modelling (ARM) pedagogical approach during their placements in Malaysian primary schools. The ARM approach was designed to support the implementation of the Malaysian primary school mathematics curriculum, which involved changing classroom practice in learning and teaching. It was developed and used during a Malaysia-UK collaborative project to construct a Bachelor of Education (Honours) degree programme in Primary Mathematics for a cohort of 120 student teachers in Malaysia. The three principles integral to the ARM approach were repeatedly made explicit to the student practitioners who were engaged in learning and teaching on the new degree programme. Using findings from surveys carried out with the students at the end of their first and final placements, this article provides examples of the way some of them described ARM and recounted how they had used the approach in the classroom. Four of these narratives are used as 'vignettes' to illustrate the students' perceptions of using new ways of learning and teaching in primary schools and to inform and enable a discussion of the relationship between theory and practice in teacher education.

Key-words: Action, reflection, modelling (ARM); Malaysia; student teacher; teacher education; theory and practice

Introduction

In asserting that 'Students of teaching are in an ideal position to generate knowledge and insights into learning about teaching and its impact on their own understanding about teaching and learning in ways different to that of more experienced, or distanced, others', Loughran (2006, p 140) recognised the value for student teachers of knowledge gained from their peers. This article presents Malaysian student teachers' reports of their practice of using action, reflection and modelling (ARM) during their first and final placements in Malaysian primary schools. The ARM pedagogical approach was developed by teacher educators from Malaysia and the UK and used during a collaborative project to construct a Bachelor of Education (Honours) degree programme in Primary Mathematics in Malaysia (Dickerson et al., 2011; Jarvis et al., 2014). The three principles, action, reflection, and modelling, were chosen to emphasise particular components of pedagogy and to support the implementation of the Malaysian primary school mathematics curriculum, which involved changing classroom practice in learning and teaching (Ministry of Education Malaysia, 2003).

This article is one of a series that discusses some of the findings from the longitudinal research study carried out during the project, and contributes to the literature on early teacher development and teacher education. It briefly sets out the Malaysian context for the development of the degree programme before exploring some of the literature relating to the role of practice and theory in teacher education and teaching practice, and describing the collaborative project. It outlines the context, theory and practice of each of the three principles and the rationale for using them within this Malaysian degree programme. This article then describes the research method used to document the students' accounts of using ARM during their school placements and presents some of the students' descriptions of the approach together with four of these narratives as 'vignettes' in which each student's reported practice is linked with the theory of ARM. The article concludes with some implications for student teachers and teacher educators.

Context

Primary education and teacher education in Malaysia

Within the National Education System in Malaysia, children start compulsory primary education at the age of seven years. At the end of this six year phase of schooling, pupils take a set of national examinations, the Primary School Achievement Test, Ujian Penilaian Sekolah Rendah (UPSR) before progressing onto secondary education (Prime Minister's Department/United Nations Country Team, Malaysia, 2011). Traditionally, education is often more teacher than pupil focused (Galam, 1997; Ali, 2007) and pedagogical approaches in schools frequently involve rote learning. More recent national curriculum specifications emphasise aspects of active rather than passive learning as specified in the context of this project, for example, in the mathematics curriculum for Malaysian primary schools (Ministry of Education Malaysia, 2006). This suggests that teachers and pupils should engage in constructivism in their approach to learning and teaching in the classroom, which Edward (2001) notes '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' (p. 431, emphasis in original). Developing teachers with appropriate skills and confidence to implement this curriculum presents a challenge (Cheah, 2010). Because student teachers tend to teach as they were taught (Hill, 2000), there are important implications for the design of teacher education programmes when the student teachers have not experienced social constructivist teaching (Noel, 2000).

Significant recent developments in teacher education in Malaysia have included an increase in the percentage of graduate school teachers; for primary schools the Government sought to increase the percentage of graduate teachers to 60 percent by 2015 (Prime Minister's Department, Malaysia, 2010). This represents a rise from 4 percent who had reached tertiary level education in 2003 although most had completed secondary level vocational programmes (UNESCO Institute for Statistics, 2006). Also of particular relevance for this project, English instead of the Malay language was used for the teaching and learning of mathematics and science subjects in Malaysian schools as a result of a policy decision made by the Government of Malaysia in 2002 (Ong & Tan, 2008). This policy, known as Pengajaran dan Pembelajaran Sains dan Matematik dalam Bahasa Inggeris (PPSMI), was reversed in 2009 after six years of implementation (Singh & Sidhu, 2010).

Teachers in Malaysia are selected according to strict selection criteria (Prime Minister's Department/United Nations Country Team, Malaysia, 2011) and the emphasis on the importance of examinations in schools (Cheah, 2010) continues into teacher education programmes where there is a tendency to use theory-based rather than practice-based approaches. Students are awarded the Bachelor of Teaching degree on successful completion of the programme (UNESCO; International Reading Association, 2008).

Connecting theory and practice in teacher education

Flores and Day (2006) reported that first and second year teachers experienced tensions between management in the dynamic and complex setting of the classroom and the theories of pedagogy, such as constructivist approaches they had learned whilst at university. This misalignment between what they would *like to do* and what was *feasible* in the practice setting, can be seen as relating to the widely reported gap between the theory and practice of

teaching (Cheng, Cheng, & Tang, 2010); a 'mismatch between beliefs and practices' (Flores & Day, 2006, p. 225).

Loughran (2006) draws attention to the complexity and messiness of teaching and Korthagen et al. (2006) highlight the problems associated with teacher education approaches that make it seem straightforward or support the idea of a set of instructions. They assert that one of the challenges is to find mechanisms for connecting theory and practice 'in such a way that teachers would be able to handle the problems of everyday teaching through theory-guided action' (p. 1021); seeking to achieve 'a pedagogy of teacher education that is both empirically based and practically oriented' (p. 1022, italics in original). Loughran (2006) explains the intertwined nature of theory and practice as follows:

'It is not difficult to see that teaching can be viewed as comprising a knowledge of theory in and through practice and that each gently moulds the other in the creation of purposeful pedagogical experiences. The ability to make all of this clear and helpful to students of teaching through the experiences of teaching and learning in teacher education requires a genuine scholarship of teacher education and demands much more than simply "demonstrating good teaching". (p. 18)

The challenge of connecting theory and practice has traditionally been seen in terms of developing practice on the basis of theory but alternative approaches have been developed. For example, Korthagen and Kessels (1999, p. 7) highlighted the importance of integration, proposing an alternative 'realistic approach', which started with practice and led to theory and was based on two theoretical frameworks and integrated theory-based, competency-based and reflective approaches. This approach is based on a constructivist view of learning (Kroll, 2004). Working with student teachers' experiences of teaching practice and integrating these with theoretical knowledge presents a problem for teacher educators (Tigchelaar & Korthagen, 2004). Indeed, these and other teacher educators have wrestled with the issues associated with the tensions between the roles of theory and practice (for example, Kessels & Korthagen, 1996; Hobson, 2003; Tigchelaar & Korthagen, 2004). Drawing on findings from a case study of development of understanding of constructivist theory of graduate pre-service teachers, Kroll (2004) suggests that the approach to teaching theory can help students 'integrate their own ideas of learning and teaching with constructivist theory in order to think critically about their own practice in an ongoing developmental manner' (p. 199). The challenges involved in integrating theory and practice are heightened when student teachers are asked to learn to teach in ways that are new to them, to colleagues in the school setting and possibly the teacher educators themselves. Hill (2000) asserts that 'Most training experiences are not sufficiently powerful to change entrenched attitudes and understandings about pedagogy' (p. 37). She suggests that combining opportunities for integrating practice, theory and reflection and asserting autonomy and individual purpose in teacher education can help student teachers overcome such problems.

The BEd degree programme

The ARM pedagogical approach was developed for and used throughout a four year Program Ijazah Sarjana Muda Pendidikan (PISMP) or Bachelor of Education (Honours) (BEd) degree programme in Primary Mathematics, with English and Health and Physical Education as minor subjects. This programme was developed jointly by teacher educators in the School of Education from the University of Hertfordshire, UK, and their counterparts in two Institutes of Teacher Education in peninsular Malaysia: Institut Perguruan Kota Bharu (IPKB) and

Institut Perguruan Temenggong Ibrahim (IPTI). The University was also responsible for programme validation, support and quality assurance. It was one of four overseas universities funded by the Ministry of Education Malaysia to support the transition from diploma to degree level for primary school teacher education (UNESCO; International Reading Association, 2008).

A cohort of 120 students studied the programme full-time from 2006 and graduated in 2010. The learning and teaching was conducted through the medium of English within the Institutes and in placements (practicums) in Malaysian primary schools and many of the students and all of the Malaysian teacher educators were bilingual or multilingual. During their studies students acquired the requisite knowledge, understanding and skills to teach the degree subjects within the Malaysian primary school system.

ARM pedagogical approach

The names of the three principles, action, reflection and modelling, were combined in a sequence that provided the programme participants with a readily recalled acronym, ARM, and the approach was modelled, promoted and used throughout the degree programme. The process of developing, sharing and using ARM is explicated elsewhere (Jarvis et al., 2014) and this section provides only a brief overview of this process and of the context, theory and practice of each principle and the rationale for combining them to form the distinctive approach. In this article, Eraut's (1994) definition of theory is taken: 'Educational theory comprises concepts, frameworks, ideas and principles which may be used to interpret, explain or judge intentions, actions and experiences in educational or education-related settings' (p. 60).

Action, reflection and modelling were concise and readily shared and recalled; aspects that were seen as important for supporting consistency in approach and understanding. Although clearly defined within the project, each of the three terms is open to many interpretations and some of these differences are referred to below. The principles were identified with reference to the Ministry of Education Malaysia curricular requirements, knowledge of the philosophy of education in Malaysia and the teacher educators' own values and experience. The teacher educators from the UK and Malaysia worked together for a week prior to the teaching of each module to identify how the Malaysian teacher educators would use the principles to teach the student teachers during the sessions. These included practical mathematics tasks and assessments and specific activities designed to enable Malaysian students to ask questions and challenge their teachers. There was an expectation that the principles would be explicitly modelled during each session in the Institute. This was in itself challenging for the Malaysian teacher educators, who like their students, were used to a more transmission approach. Joint working between UK and Malaysian colleagues was important so that there was a shared development of the teaching approaches. For example, instead of giving student teachers a demonstration of a mathematical process on the blackboard, the students experienced an enquiry approach and then reflected on their learning through using this approach. Staff taught about the modelling they were doing and then worked with the student teachers to generate ideas for how they could do this with pupils. Thus, the acronym ARM drew together three well-researched components of teacher education as a way of focusing both staff and students on remembering and including all three elements in their teaching. Using modelling in relation to reflection and action meant that the modelling focused on action and reflection in practice, which was appropriate in relation to the Ministry of Education Malaysia purpose for the programme.

In developing principles for teacher education practice and programmes, Korthagen et al. (2006) suggest a refocusing on teaching *students* rather than the curriculum; so that supporting students to learn how to teach means 'helping them to learn how to help children learn' (p. 1030). Revealing the principles of teaching practice in this way to teacher educators and their students is important for student teachers' development (Loughran, 2006). Drawing on Kroll's (2004) assertion in a broader context, ARM and its constituent principles provided 'a set of lenses and language with which to view and talk about teaching and learning' (p. 202) on the programme.

Context, theory and practice

Action

The principle of 'action' aligned with the Malaysian Ministry of Education requirements for the degree programme that pupils should be engaged in active rather than passive learning in the classroom. This view was endorsed in the curriculum specifications for mathematics in primary schools, which stated that mathematics learning included developing an understanding of mathematical concepts, the ability to solve problems, and communicate mathematically (Ministry of Education Malaysia, 2006). Bonwell and Eison (1991, p. 19) developed a 'working definition' of active learning 'as anything that "involves students in doing things and thinking about the things they are doing."' Contextualised within the college classroom, this definition was developed in the light of the following characteristics that are often associated with strategies used to promote active learning:

- 'Students are involved in more than listening.
- Less emphasis is placed on transmitting information and more on developing students' skills.
- Students are involved in higher-order thinking (analysis, synthesis, evaluation).
- Students are engaged in activities (e.g., reading, discussing, writing).
- Greater emphasis is placed on students' exploration of their own attitudes and values.' (Bonwell & Eison 1991, p. 19)

Strategies that support active learning relate to learning and teaching approaches aligned to theories of learning such as those developed by Piaget, Bruner and Vygotsky (Piaget, 1954; Bruner, 1974; Vygotsky, 1978). Van Huizen, van Oers and Wubbels (2005) note that the Vygotskian perspective that 'individuals develop personal meanings through being engaged in social practices' (p. 280) emphasises the importance of social interaction in learning and can be applied to the interactions within and between those groups engaged in teacher education including teacher educators and student teachers. It can also be applied to the learning of pupils. Constructivism is one of the learning and teaching approaches endorsed in the curriculum specifications cited earlier (Ministry of Education Malaysia, 2003). Kirschner, Sweller and Clark (2006) argue that there is significant evidence that using minimal guidance is less effective for student learning than approaches that emphasise guidance and suggest that 'The constructivist description of learning is accurate, but the instructional consequences suggested by constructivists do not necessarily follow' (p. 78). The teacher educators and student teachers on the degree programme were recommended to use active learning approaches throughout the degree programme both in the Institutes and in schools. There were some differences in practice and understanding, for example, some of the student teachers associated the role of 'action' in learning with engagement in some form of physical activity.

Reflection

Reflection is a well-established principle; according to Dewey (1910) reflective thought is *'Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends…'* (p. 6, emphasis in source). Critical reflection is seen as important for adult learning (for example, Schön, 1982; Mezirow, 1990; Brookfield, 1995). Brookfield (1995) explains that:

> '…reflection becomes critical when it has two distinctive purposes. The first is to understand how considerations of power undergird, frame, and distort educational processes and interactions. The second is to question assumptions and practices that seem to make our teaching lives easier but actually work against our own best long-term interests.' (p. 8)

Although introduced into the college level teacher education curriculum in Malaysia in 1989, adoption of the concept of the reflective practitioner within programmes was variable (Heng & Khim, 2004). Loughran (2002) noting the variety of meanings of reflection, links it with practice in order to make it *effective*; a process that might be seen as repeatedly formulating an aspect of practice and responding to this through action so that professional knowledge and understanding of practice is enhanced. Thus 'reflection on practice' is essential for 'learning through practice' (Loughran, 2002, p. 42). In a study of the 'reflective practicum' involving final year primary student teachers, Dobbins (1996, p. 269), suggested that although the process of reflection added to the complexity of the learning process, it enhanced the learning experience, enabling the students to learn from issues of personal significance, and importantly the pupils were thought to have benefited from the focus of reflection on learning. In this project, the student teachers were encouraged to reflect on their teaching practice, on their learning more generally, to use this reflection to raise questions, and to engage the pupils in reflection on their learning. Reflection is essential for linking practice and theory; and making the rationale for learning and teaching practice clear and accessible for students is an important component of modelling in teacher education (Korthagen et al., 2006).

Modelling

Modelling was selected to emphasise the process of making the hidden or tacit components of teaching as well as the content clear to the student teachers throughout the programme (Loughran, 2006). Lunenberg et al. (2007) have identified four forms of modelling; implicit modelling and three types of explicit modelling: explicit modelling as described by Loughran (1995) and Berry and Loughran (2002); explicit modelling and helping students to see how this might be used in their own practice; and 'Connecting exemplary behaviour with theory' (p. 592). Teacher educators can use explicit modelling to create new ways of encouraging students to see opportunities for learning about teaching that are present in their experiences; in the process of modelling the teacher educators themselves learn about teaching (Loughran & Berry, 2003). In case studies of ten teacher educators, Lunenberg et al. (2007) found examples of explicit modelling, some of which involved helping students to translate modelled behaviour into their own practice, but none in which the teacher educator linked their practice to theory, which they suggested 'would have deepened the student teachers' professional learning' (p. 597). Drawing on findings from the literature the authors considered that although modelling can be powerful, it is often not used to its potential to increase the impact of teacher education programmes on student teachers' learning (Lunenberg et al., 2007).

In Malaysia, the concept of modelling in learning and teaching is closely linked to the idea of the teacher as a model of behaviour for the pupils, particularly in relation to ethical aspects and moral values (Carr, 1991). During the degree programme Malaysian teacher educators and student teachers engaged in modelling in the Institutes and the students modelled to pupils in the classroom.

Research Methods

Aims, participants and data collection

The main aims of the longitudinal research programme reported here were to investigate the student teachers' views and experiences of using ARM during their first and final school practicums. Four personal accounts of classroom practice included in this article have been selected to illustrate the students' perceptions of using new ways of learning and teaching in the classroom as they were 'learning to teach' and to inform and enable a discussion of the relationship between the practice and theory of ARM. These narratives have been selected from the extensive dataset available in the full project report (Dickerson et al., 2011). The complete project dataset comprises more than 1000 individual question responses from surveys of student teachers; and responses from senior managers, teacher educators and school mentors engaged on the programme.

This article addresses the following research question: What can we learn about theory and practice in teacher education from individual student teachers' accounts of using an explicit model of pedagogy, ARM, in their early classroom practice?

Student teachers on the BEd degree programme completed questionnaires at the end of their first and final placements (year 2 and year 4). These questionnaires were administered and collected by Malaysian senior managers and teacher educators. In total, 110 of the 120 students responded to the first survey and 87 students contributed to the second (response rates, 92% and 73% respectively). The terms 'student teacher' and 'student' are used to refer to these respondents and the pupils they taught in primary school, ages 7 to 12 years, are referred to as pupils or children. The student teachers were invited to respond to open-ended questions, leading to qualitative data in line with the aims of the study, which emphasised the participants' views and experiences (Pope & Mays, 1995) and the perspective of each individual (Denzin & Lincoln, 2005). This article includes four complete responses, two from each of the following matched questions posed at the end of the placements selected from a total of 196 responses to these two questions.

– How did you use ARM on your [first] placement?
– How did you use ARM on your final placement?

These four 'information-rich' responses were selected using purposeful sampling (Patton, 2002, p. 46). According to Patton (2002, p. 230), 'Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry… Studying information-rich cases yields insights and in-depth understanding rather than empirical generalizations.' Here, the responses were selected as interesting cases that would enable a critique of theory and practice in teacher education. Respondent anonymity was preserved so it is not possible to know whether these responses are from four different students.

Data management and analysis

The research programme was managed by the Malaysia-UK collaborative project lead from the University of Hertfordshire, a senior teacher educator/researcher and a research fellow who drew on the expertise of other colleagues within Malaysia and the UK during the course of the research. The research fellow coordinated the data management and analysis in consultation with the research team members and other researchers and teacher educators within the School of Education with extensive experience of the project; together these colleagues formed an 'advisory group'. The research fellow transcribed the survey responses from the hand written self-completion questionnaires to give typed data texts for analysis, and verified these texts against the original documents, if necessary in consultation with a colleague. The written responses were completed in English. A small number of spellings and abbreviations were standardised in the final data texts, which facilitated electronic searching.

The student teachers' responses to the question collected at the end of the first placement (How did you use ARM on your [first] placement?) were content analysed (for example, Patton, 2002; Schreier, 2012). The research fellow repeatedly read the data texts, identifying and refining emerging themes in consultation with other members of the advisory group. Initially, responses to the question 'How did you use ARM on your [first] placement' were analysed by two colleagues, the research fellow and a second member of the group and extracts of responses that included references to action, reflection and modelling were categorised according to whether student teachers and/or pupils were involved. The research fellow subsequently carried out secondary categorisation for the questions about the use of ARM in year 2 and year 4 based on three different response patterns that were observed through working with the data: separate accounts of the use of each principle in the ARM sequence; ARM as an integrated approach; and an alternative approach (Table 1). The research fellow rechecked the categorisation and provided numbers and percentages of participants using each response pattern; these are tentative as the complexity of the responses means that some could be placed in more than one category. This process was shaped by the experience and understanding of the researcher (Clarke & Braun, 2014).

Table 1   Examples of three different response patterns observed in the data

Response pattern	Example (first placement)
Separate accounts of the use of each principle in the ARM sequence	A – While I am doing my lesson plan, I tried to plan for interesting activities to make my pupils engage in learning. R – I made to my pupils to recall what they had learnt throughout the lesson and raise up their doubts. M – I display examples to make my pupils understand the topic better. (R52)
ARM as an integrated approach	During my placement, I used ARM in proceeding my lesson plan. Start with Action, I did my teaching to pupils. I modelling first what pupils to do before run activities. Lastly, I did some reflections with them to make some enjoy and differents in my lesson. Actually, it was hard to model to the pupils because sometimes I forget about pupils level. (R66)
An alternative approach (for example, reference to ARM, or part of ARM)	I use ARM for every lesson I taught (R12) I asked feedback from pupils and also from teacher and lecturers who observed me so that I knew my weaknesses and strengths of the teaching (R58)

The research fellow searched both sets of survey data electronically for 'key words' or terms that the students had used to describe ARM. These terms had been noted during data analysis in the students' responses to the enquiries about their use and perceptions of ARM during their placements. Their context in the individual response was retained by presenting examples as 'Key Words in Context' (Ryan & Bernard, 2003) in Table 2. The same researcher also carried out a key word search and count on the students' responses to the question about using ARM on their first placement to identify references to selected learning and teaching strategies and objectives using the first three letters of the word (for example, 'dem' to identify demonstrating, demonstrate, demonstration).

Patton (2002) emphasises the value of the participants' own words noting that 'Direct quotations are a basic source of raw data in qualitative inquiry, revealing respondents' depth of emotion, the ways they have organized their world, their thoughts about what is happening, their experiences, and their basic perceptions' (p. 21). In this article, four examples of the student teachers' own words recorded in response to the question about using ARM whilst on placement, are used as 'vignettes', providing a rich source of further enquiry, where each vignette is defined as 'A brief evocative description, account, or episode' (Oxford Dictionary, 2014). Vignettes are used for various purposes in research (Wareing, 2010) and can take different forms, such as brief accounts of hypothetical people or situations (Poulou, 2001) or personal records of practice written using a pre-defined template and developed further in conjunction with a researcher (Miles, 1990). When exploring the use of observer developed vignettes in supporting teachers' professional development, Angelides and Gibbs (2006, p. 120) noted the benefits for teachers of using 'analysis of a vignette as a means of exploring practice through the application of professional judgment'.

Findings and discussion

Connecting the theory and practice of ARM

Describing ARM

In this project, the three principles integral to the ARM approach were repeatedly made explicit to the student practitioners who were engaged in learning and teaching on the new degree programme. Terms one student used to describe ARM (model, guidance to follow, 'next step' toolkits) at the end of their first placement and synonyms used by others in the cohort (Table 2) in their responses to the surveys suggest that ARM provided a means of discussing learning and teaching and assessing classroom practice.

> 'I feel quite confident in using ARM model. The reason is I have a guidance to follow. ARM model also can enhance my teaching style and feel the lesson become quite systematic. When I stuck what to do in my lesson, ARM can be as my "next step" toolkits.' (R66)

However, although ARM provided a language to use for discussing pedagogy during the programme (Kroll, 2004), the students' feedback also raises interesting questions for this model of teacher education. For example, did using ARM inform the theory-practice connection recommended by Korthagen et al. (2006) at least for some students? Beattie (2000) reported that prospective teachers were disappointed that they did not receive what she described as 'the packaged goods approach' (p. 2) to developing as a teacher. So was ARM viewed by some as a benchmark against which they could check their teaching, helping them

to answer the question 'am I doing this right?', thereby meeting a need for a 'correct way' to teach and encouraging a more mechanistic or tick-list approach to practice? Using Hobson's (2003) typology, did using ARM encourage student development as an 'understanding-oriented learner' or rather as a 'proceduralist apprentice' or 'education-oriented apprentice' (p. 252) in relation to their approach to learning to teach and recognition of the value of theory? Did it emphasise learning how to identify, in the classroom situation, which approaches and strategies to use or more simply a knowledge of procedures (Korthagen & Kessels, 1999)?

Table 2   Extracts from student teachers' responses to show some examples of the terms they used to describe ARM

ARM concept

End of first placement

- In my teaching I used the ARM concept to give better understanding to my pupils
- I think the practice of ARM concept can stimulate the interest, generate the ideas for both parties, pupils and teacher

End of final placement

- I have designed my activities based on the concept of ARM
- I didn't understand the full concept of the model

ARM element

End of first placement

- My pupils will acquire a quality and effective learning after I implement the ARM element

End of final placement

- I used all the ARM important elements in this final placement of mine
- I always ensuring my lesson plans have the element of ARM

ARM formula

End of first placement

- The ARM is very useful formula in being a teacher

ARM guide/guidance/guideline

End of first placement

- I will use ARM as a guide for my future teaching
- To be an excellent teacher, ARM is not only a guidance. A teacher should improve and upgrade himself with others elements

End of final placement

- I become more systematic in my teaching and made ARM as my guidance
- Guide and enhance me in my learning

ARM model

End of first placement

- I feel quite confident in using ARM model...ARM model also can enhance my teaching style
- The ARM model benefits me a lot in improving my teaching

End of final placement

- The ARM model really help me in my teaching and also help the pupils to learn better
- Through out the ARM model, I can assess my pupils and my teaching either it was effective or not from my pupils' reflection

ARM theory

End of first placement

- I becoming more skillfull teacher because I manipulate the ARM theory in classroom
- I hope that ARM is not just a theory but a actual way to become a good teacher

ARM tool/toolkit

End of first placement

- When I stuck what to do in my lesson, ARM can be as my 'next step' toolkits
- ARM...acts as a tool to motivate me to think & plan effective teaching & learning approaches

End of final placement

- In addition it could be one of the tool for me to teach the pupils
- ARM have acted as a tool to improve my teaching and also my students' learning

Using ARM in the classroom

The student teachers' accounts of the way they had used ARM in the classroom suggest that they were going beyond linking practice with theory to *using* it as a basis for practice. Documenting individual perspectives (Denzin & Lincoln, 2005) meant that the students' responses were varied but the clarity of the presentation (active modelling) of ARM during teacher education was implicit in many of their reports. The students structured their accounts in one of three ways; these ways were used to categorise the data although the complexity of the responses meant that some could have been placed in more than one category (Table 1). At the end of their first placement more than half of the students (62, 56%) documented their practice as separate accounts of the way they had used each principle according to the sequence of the acronym, which was devised for easy memorisation, but did not represent a linear sequence for use in the classroom. This response structure was also used by more than a third of the students at the end of their final placement (33, 38%). Fewer students in each case viewed ARM as a whole entity, presenting their report of its use as an integrated approach, describing their practice as it might happen in the classroom, demonstrating a fluid approach to moving between the elements but referring explicitly to each of the three principles (11; 10% first placement and 11; 13% final placement). The remaining students adopted alternative ways of recording how they had used ARM; the second of the following four vignettes provides one example. Although in this vignette the three principles can be identified, some students referred only to 'ARM' or part of ARM (Table 1).

When extracts of responses that included references to action, reflection and modelling were categorised according to whether student teachers and/or pupils were involved, different patterns of reporting were identified. Student teachers referred to the activities of student teachers only, student teachers and pupils, and pupils only engaging in action or active learning and reflecting on their teaching or learning (Dickerson et al., 2011). They reported that they modelled to explain, show or increase understanding for their pupils or modelled their attitude, behaviour or example; and one student suggested that both student

teachers and pupils engaged in modelling (R73, Vignette 1). Different ways of reporting are illustrated in the following responses to the first survey:

Involvement of student teachers
- Action: the process of delivering the content by using a few approach or activity. For example, role play, explaining or questioning. (R67)
- Reflection – reflection on learners' needs; reflect & improvement of the lesson; reflect the ability of students. (R74)
- Modelling – I use modelling to explain something to my pupils. I show ways to do something to them. As for example, in topic of length I show them how to use rule. (R70)
- For the modelling part, I try to show good manner or attitude for every aspects. (R44)

Involvement of student teachers and pupils
- Active learning – 1) Create an interesting set induction in every lesson to gain pupils attention and interest. 2) Create more activity that can be participate and involving many pupils, so that they'll work together. (R100)
- Reflection: teacher – to improve the teaching strategy so that the pupils' need is met; pupils – to identify the point to improve base on the feedback given by the teacher; to identify the weaknesses of the lesson, to help the teacher to improve his/her teaching. (R67)
- While modelling is appropriate when my pupils get stuck and need helps. One way to get them understand is by modelling, not only teacher's model but pupils also can modelling on what they've learn. (R73)

Involvement of pupils only
- A = Active learning – create different activity that are interesting and involve all student to stimulate their interest in learning. (R16)
- Reflection – pupils do self-reflection after the lesson; feedback after the lesson. (R98)

The student teachers referred to learning and teaching strategies used in a range of pedagogical approaches. At the end of their first placement, explaining, questioning and demonstrating (or related terms such as explain, explanation) were mentioned by 24 (22%), 21 (19%) and 19 (17%) students respectively (Dickerson et al., 2011). Of the remaining eight strategies explored using key word searches, instructing, listening and evaluating were reported by 4 (4%) or fewer respondents and directing, describing, informing, coaching and summarising were not mentioned.

The findings presented so far illustrate the variety of responses, the students' descriptions of ARM, and their references to selected learning and teaching strategies and objectives. These findings contextualise the vignettes that follow; four accounts documented by the student teachers when asked to articulate their practice of ARM on their school placements. In these vignettes each student's description of their practice has been mapped against the principles of action, reflection and modelling and set within the context of using constructivist approaches to learning and teaching, and the wider literature to illustrate the relationship between the reported practice of the approach in school and the principles (theory/ies) that underpinned it. In this way, in response to the research question, these students' accounts of using ARM are used to contribute to learning about theory and practice in teacher education.

Whilst experienced teachers' behaviour is based on a wealth of practical teaching experiences and knowledge developed through reflection on their actions (Tigchelaar & Korthagen, 2004), such opportunities are not available to students and early career teachers such as those engaged in this programme and their ability to solve pedagogical problems in the midst of the classroom is constrained by this. Nevertheless, the following accounts illustrate that these students are already building up their own experiences of teaching, which they can use for reflection and practice development. Their narratives provide a collated record of the way they had used ARM, as required by the survey question rather than one specific example of their practice. They demonstrate Denscombe's (1982) assertion that despite elements of constancy in the classroom, certain constraints mean that 'the methods of teaching and the quality of the teaching remains a highly *personalised phenomenon* – a product of personal skills and personal interaction' (p. 256, emphasis in original).

Vignette 1: teaching English, mathematics and physical education

'I have applied ARM concept as much as I can in all subjects I've taught. When planning a lesson, I had consider ARM to appropriate activities. For each lesson I tried to involve an actions, reflections and modelling (ARM). For instance, I've asked to act as I acted like claps, steps, laugh, cry, angry and so on for English subject. Meanwhile for Maths lesson, I've done an action activities for measuring length, mass and volume. It is more actions involve during teaching PHE when my pupils have to catch and pass the ball, do running, galloping, skipping and many more. For reflection, it is must before I've end the session by pupils' presentation. My pupils reflected on what they've learnt during that session in order for me to make them get clear success criteria. While modelling is appropriate when my pupils get stuck and need helps. One way to get them understand is by modelling, not only teacher's model but pupils also can modelling on what they've learn.' (R73)
(How did you use ARM on your [first] placement?)

In this student teacher's description of English, mathematics and physical education lessons, ARM is considered in the planning stage and runs throughout the learning and teaching process. The references to ARM are overt, and the principles quite clearly identified. The similarity between action and modelling is apparent, as the student reports 'I've asked to act *as I acted*' illustrating how they had used modelling to show pupils *how* to engage in an activity. They explain that the teacher can model to help pupils understand ('One way to get them understand is by modelling'), and the pupils can model to show their learning. This might suggest that the student views modelling as direct instruction, associated with demonstrating, showing or telling (Desforges, 1995), rather than as the 'double layered' process described by Loughran (2006), which also involves concurrently making the process of teaching itself explicit. Although active learning does not necessarily require physical activity, most of the examples reported in this account do involve 'action' on the part of the pupils such as clapping, stepping, running and skipping; imitating emotions, such as laughing and crying; and measurement. The student teacher doesn't provide an explicit reference to their own reflection but notes that they used the results of the pupils' reflection on their learning. There are references to pupil learning and understanding. In this example, the teacher engaged in action and modelling, and suggests that their pupils could take part in all three components of ARM: action, reflection and modelling.

Vignette 2: planning, activities, improvement and teaching skills

> 'I use ARM on my placement:
> '(a) Planning lesson. I have made lesson plan before start my lesson in order to make my lesson successfully. I have stated the learning objectives, the content of the lesson, the technique that I want to use, and the material. From that, I can make my pupil interested and they are active in learning.
> '(b) Activities. I have created some activities in groups, pair or individually. From that, my pupils can learn by their own and their peers. In addition, I made interesting activities in order to avoid them bored and encourage them to learn.
> '(c) Improvement. After I have taught my pupils, I identified the strength, and the weaknesses. I also list down the improvement that I can use for next time. For example, I change the techniques or activities if it not suitable for that topic.
> '(d) Teaching skills. I have used varieties of teaching skills such as questioning, explaining, demonstrating, role play, story telling and listening. Those skills helps my pupils understand clearly the topic that I have taught to them.' (R103)
> (*How did you use ARM on your [first] placement?)*

In this second example, the student has adopted a set of headings to structure their response. These headings are less clearly aligned to the ARM model although each of the principles can be identified from the text. For example, there are references to activities and 'active in learning'; to identifying strengths, weaknesses and improvements, which might involve reflection; and to demonstrating, which is closely aligned to modelling. Once again, planning features in the narrative, and the lesson plan is seen as necessary for the success of the lesson. This involves establishing the learning objectives, the content, the strategies and the resources. The student's record of these processes provides insight into aspects of the transformation noted by Shulman (1987), in which the student teacher in this example is moving from personal understanding to preparing for the understanding of the pupils, 'the essence of the act of pedagogical reasoning, of teaching as thinking, and of planning – whether explicitly or implicitly – the performance of teaching' (p. 16); reasoning, which is as integral to teaching as the practice in the classroom itself. The student's narrative illustrates Loughran's (2006) view of 'teaching as being carefully structured, thoughtfully created and deliberately informed in order to engage students in learning for understanding' rather than as 'simply doing' (p. 15). As in the first vignette, the student teacher refers to pupil understanding and pupil learning rather than knowledge. Active learning, including individual and peer learning is encouraged by providing 'interesting activities' that the pupils carry out on their own or with one or more of their peers. The suggestion that pupils could learn from their peers ('my pupils can learn by their own and their peers') is at variance with cultural views where teachers are seen as experts and providers of knowledge (Tan, 2007). Although not termed reflection in this example, the student describes how they focused on ways of improving their teaching practice by considering what went well during a session and what went less well.

Vignette 3: encouraging pupils' communication and improving future teaching

> 'I engaged my students in learning frequently by giving more chances to students to answer and voice out opinion, creating own questions and work in pair and group. I did reflection everytime I finished a lesson and thought deeply on how to improve my teaching. I also discussed with my partner on how to overcome problem occurred. I also

modelled to replace any explanation to help my students get better understanding.' (R55)
(How did you use ARM on your final placement?)

Although some of the responses to the question about the use of ARM at the end of the final placement were less clearly delineated by the principles, in this third vignette, two of the three components of ARM are referred to explicitly and the third can be teased out from the text. As in the two earlier vignettes, the student teacher refers to pupil understanding and pupil learning rather than knowledge. This student's account of their practice suggests an emphasis on the pupils' communication; pupil-pupil interaction in pairs and groups, and making 'space for the emergence of student voices' (Beattie, 2000, p. 6), which aligns well with the emphasis the Ministry placed on constructivist learning (Ministry of Education Malaysia, 2006). The student suggests that they used reflection on completed sessions as a means of improving future teaching and acknowledges the role of a partner in finding ways of overcoming challenges in the classroom. Thinking reflectively requires focus on a particular aspect of practice (Heng & Khim, 2004), which is suggested by the student teacher's assertion that they 'thought deeply on how to improve my teaching'.

Vignette 4: facilitating and providing pupils with space to construct knowledge

'Encourage active learning. Students always being given their own space in learning to construct their own knowledge. Teacher work as the facilitator.' (R26)
(How did you use ARM on your final placement?)

As the students gained experience of teaching they might be expected to adhere less closely to the 'language' of ARM, as in this example, developing greater individuality and diversity in the expressions and language they used to explain their learning and teaching practice. Developing confidence and experience in the classroom would also in this project be linked to greater proficiency in communicating in English. In year 4 many of the students' responses were more concise than they had been in year 2, and in this example, the student encapsulated their classroom practice in just three sentences. These reveal something of the 'tip of the iceberg' of teaching that occurs within the classroom and in the context of constructivism, it seems to be this classroom activity that Windschitl (2002) asserts has been revised as a result of research so that 'theorists have proposed new ways of framing the act of teaching, for example, as co-constructing knowledge *with* students, acting as conceptual change agent, mentoring apprentices through the zone of proximal development, and supporting a community of learners' (p, 135, emphasis in original). In this example, the student teacher suggested that they were allowing the pupils to 'construct their own knowledge' rather than engaging in co-construction, facilitating them as they engaged in learning. Shulman (1987), in his discussion of teaching, 'emphasize[s] teaching as comprehension and reasoning, as transformation and reflection' (p. 13) and provides a view of teaching that encompasses the whole process, both the hidden elements and the 'act' of teaching itself, asserting: 'it begins with an act of reason, continues with a process of reasoning, culminates in performances of imparting, eliciting, involving, or enticing, and is then thought about some more until the process can begin again' (p. 13). At this stage, the student seems to be using an underpinning 'big theory' which guides their practice, perhaps suggesting a more developed representation of theory-based teaching.

Learning about theory and practice through using ARM

The vignettes could be seen as illustrating a view of teaching as 'comprising a knowledge of theory in and through practice' (Loughran, 2006, p. 18). The narratives suggest that these students have used the model to construct their practice in different ways, a feature which seems more developed at a later stage in the programme. The presentation of the three principles as interrelated parts of a single entity, ARM, might have contributed to a sense that students found this meaningful as a whole and easier to use than seemingly disparate theories. Each principle is contextualised by always being linked to the other two raising questions about whether this integration enables the components to interact in a synergistic rather than an additive way; enabling the students to think of the 'whole ARM' first and deconstruct it rather than thinking of three separate parts. Certainly, the use of the acronym 'ARM' seems to have helped these early career teachers keep all three principles in mind, thereby supporting a change from the deeply embedded traditional forms of practice used by teachers in Malaysia (OECD, 2009). One should not exaggerate. In some ways the vignettes evidence a lack of sophistication in the students' use of theory in practice as might be expected at such an early stage in their experience of teaching. Active learning is sometimes represented as active in just the physical sense; reflection could be limited to the focus of technical skills; while modelling was used (as noted above) by some primarily at the level of instructing or demonstrating. But 'combining' these principles into the set represented by ARM does seem to have helped these student teachers *use* them as practical principles (Hirst, 2012) and to that extent enabled them to interrelate both these principles and their relationship with practice. In his critique of the primacy Hirst came to give to practice over theory, Misawa (2011) uses the term 'interpenetrating' to represent the theory-practice relationship. The analysis of the vignettes here indicates that this 'penetration' may be at differing depth and that the place of theory in developing a pedagogical approach can be stronger than suggested by Carr (2006).

Whilst the interpenetration of theory and practice may not always have been deep in the practice of these students, there are examples of a transformation of practice. The students themselves highlighted the change ('There have been long time that the teachers in the school are using the same traditional or old methods to teach the pupils. I think by using ARM, I did expose and demo to the pupils a new and more effective teaching style…' Dickerson et al., 2011, p. 90). Bearing in mind the power of a traditional culture, this transformation seems significant. The student teachers here may not be transformative intellectuals (Giroux and McLaren, 1987; Giroux, 1994), but the value placed on pupils and their engagement in learning as a process can, in the context of the dominant culture, be seen to represent a perspective transformation which Diamond (1991) places at the highest level in a continuum of teacher education, above the competence, personalistic and language and learning conceptions of teaching. Whilst students cannot be expected to be transformative intellectuals on their placements the expectation of the Malaysian Government was that at a later date they would lead transformation of teaching approaches in the schools in which they were placed.

Although school mentors are important role models during placements and students often adopt their mentors' approaches even when these are at variance with practice or theory suggested during their teacher education programme (Moore, 2003), these students' accounts do not suggest this. However, there are concerns that the student teachers used the language of ARM because they were expected to do so rather than because it was becoming part of their own professional language, and that using ARM might encourage a 'mechanistic' approach to practice. Indeed, students may well use ARM mechanistically in the early stages of their development when they are likely to focus mainly on teaching regardless of pupil needs in context (Fuller, 1969). A more authentic use might be developed as students become

more aware of learning and learner needs and respond to these tacitly. Longer term research on these early teachers could inform these issues and help to determine whether they were developing as a 'proceduralist apprentice' or were developing greater understanding of pedagogy and the value of theory (Hobson, 2003, p. 252). This follow-up research will include an exploration of these early teachers' current practice in the classroom and how it relates, if at all, to ARM.

Strengths and limitations of the research

Although the student teachers' accounts should be contextualised within this complex cross-national study and the limitations of the survey method, they provide valuable insights into their views and experiences at two important stages of their teacher education programme. The quality of their reflections contribute to understanding early teacher development both in the Malaysian setting and more widely and longer term follow-up of members of this cohort would provide valuable additional learning about early teacher development. Whilst this paper has focused on the student teachers' voices, contributions from other participants in the longitudinal study, including teacher educators and school mentors allow some triangulation and contribute to the validity of the findings.

Implications for practice

Documenting narratives of their early experiences of teaching enabled the student teachers in this project to reflect on their developing pedagogy and practice whilst providing valuable insights, which can inform other educators, including their peers. Some of their accounts imply that having a limited, pre-defined vocabulary to describe the pedagogical approach (action, reflection and modelling) was of value to them and suggests that having an explicit model of pedagogy might prove useful for initial teacher education.

Teacher education should provide a place where insights of knowledge and practice in learning and teaching can be applied, questioned and tried out (Loughran, 2006) and for the teacher educators involved in this project, participation in the programme and reflecting on and interrogating the student teachers' reports has provided a rich source of learning not only for themselves but also for others engaged in teacher education.

Acknowledgements

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