Strategies for mentoring pedagogical knowledge

Peter Hudson

Faculty of Education, Queensland University of Technology, Brisbane, Australia

Associate Professor Peter Hudson; Faculty of Education, Queensland University of Technology, Kelvin Grove, QLD 4059, Australia; Phone: 07 3138 3321; Email: pb.hudson@qut.edu.au

Abstract

Fundamental for mentoring a preservice teacher is the mentor's articulation of pedagogical knowledge, which in this research draws upon specific practices, viz: planning, timetabling lessons, preparation, teaching strategies, content knowledge, problem solving, questioning, classroom management, implementation, assessment, and viewpoints for teaching. Mentoring is haphazard; consequently mentors need a pedagogical knowledge framework and a repertoire of pedagogical knowledge strategies to guide a preservice teacher's development. Yet, what are strategies for mentoring pedagogical knowledge practices? This qualitative research investigates mentoring strategies assigned to pedagogical knowledge from 27 experienced mentor teachers. Findings showed that there were multiple strategies that can be linked to specific pedagogical knowledge practices. For example, mentoring strategies associated with planning for teaching can include co-planning, verbally reflecting on planning with the mentee, and showing examples of the mentor teacher's planning (e.g., teacher's plans, school plans, district and state plans). This paper provides a bank of practical strategies for mentoring pedagogical knowledge practices to assist a preservice teacher's development.

Keywords: student teachers, pedagogical knowledge; mentoring, mentors, preservice teachers, school experiences

Introduction

There is no doubt that student learning is the core business of education and teachers' complex practices in the classroom contribute to the student learning process. Those learning to teach will need to understand the complexities of these pedagogical practices through

guided discovery of teaching and learning with strong focuses on what constitute effective teaching practices. Combining the mentor teachers' knowledge of teaching practice with the knowledge of effective mentoring can provide preservice teachers (mentees) with valuable directions for advancing their pedagogical development. Yet mentoring can be haphazard and mentors need to develop pedagogical knowledge practices to assist them in their roles (Hudson, 2010). This paper presents experienced mentors' strategies for mentoring pedagogical knowledge practices. Pedagogical knowledge practices will be presented as the theoretical framework, followed by an outline of the haphazard nature of mentoring these practices, as a rationale for investigating this current study.

Effective mentoring is considered a way to build capacity in the teaching profession (Hobson, Ashby, Malderez, & Tomlinson, 2009; Parker, 2010) with widespread acceptance and considerable research in the field (e.g., see the journal: Mentoring & Tutoring: Partnership in Learning). However, to achieve success in mentoring requires meeting the conditions for effective mentoring, which Hobson et al. outline as: "(i) contextual support for mentoring; (ii) mentor selection and pairing; (iii) mentoring strategies; and (iv) mentor preparation" (p. 211). Considering that mentoring is largely variable and can "have the potential to do harm" (Hobson et al., 2009, p. 214), providing mentors with a well-designed mentoring program can assist in facilitating a more effective mentoring process (see Hudson & McRobbie, 2004, for a control-experiment investigation on mentors using a pre-designed mentoring program).

Studies have shown the inequities in mentoring, for example, Kardos and Johnson (2010) investigated 374 beginning teachers' mentoring experiences in their first two years of teaching with results that showed 91% of beginning teachers from high-income schools were allocated an official mentor compared with 65% in low-income schools; however their study did not determine the quality of mentoring received. Consequently, educators argue the need

to have induction and mentoring, with a rationale "...to facilitate their induction into the culture of the profession" and to have a "...focus on the mentee's ability to facilitate learning" (Hobson et al., 2009, p. 207). Indeed, there are numerous calls and recommendations for schools to provide "a carefully constructed high quality mentoring program" (Marable & Raimondi, 2007, p. 35) and that such programs need to be implemented over time (Piggot-Irvine, Aitken, Ritchie, Ferguson, & McGrath, 2009). Rajuan, Beijaard, and Verloop (2008) claim that "what student teachers learn about teaching practice from their cooperating teachers remains an unanswered question" (p. 131); hence well constructed mentoring programs can present explicit practices for ensuring preservice teachers receive quality mentoring and a way for them to articulate their learning to teach through a common discourse (Murray, Hudson, & Hudson, 2011). Others, such as Sharplin, O'Neill, and Chapman (2011), recommend timely "intervention for retention" at crisis points during the beginning teacher's first years (p. 136), which is applicable to preservice teachers. At the same time, early-career teachers need to be "open to critiques and suggestions and they should have sufficient self reflective, metacognitive skills to process, contemplate, and use the information provided" (Roehrig, Bohn, Turner, & Pressley, 2008, p. 700).

Pedagogical knowledge

Shulman presents a particular view of the term "pedagogical knowledge" as a "concern for reinstating content as a critical facet of teacher knowledge" (as cited in Morine-Dershimer & Kent, 1999, p. 21). Consequently, he coined the term "pedagogical content knowledge" (PCK) as a way of "representing and formulating the subject that makes it comprehensible for others" (Shulman, 1986, p. 9). Content knowledge is central to PCK as it is based on "topic-specific knowledge for teaching a particular subject" (Abell, 2008, p. 1413). The general term pedagogical knowledge is used frequently when referring to the knowledge for teaching (e.g., Briscoe & Peters, 1997; Coates, Vause, Jarvis, & McKeon, 1998). Such pedagogical

knowledge, which is presented in university coursework and further developed within the school setting (e.g., Allsop & Benson, 1996; Hulshof & Verloop, 1994) is critical to preservice teachers' attainment of effective teaching practices (Hudson, 2007). However, as inferred by Shulman (2000, 2004), wisdom of practice extends beyond the theory of pedagogical knowledge to practical connectivity, where pedagogical knowledge is trialled and evaluated in the field towards attaining mastery experiences (see also Bandura, 1977). Classroom teachers, in their roles as mentors, can have the wisdom from teaching to deconstruct and articulate particular, and tacit, pedagogical knowledge to guide the mentees' practices. This is especially important as preservice teachers spend as much as 20% of a four-year Bachelor of Education degree in the school setting and higher percentages in other tertiary education courses, for instance, in England about two-thirds of a postgraduate coursework for preservice teachers involves professional school experiences (e.g., practicum and internship; Hobson et al., 2006; Hobson et al., 2009). Thus, mentoring becomes pivotal for developing preservice teachers' pedagogical practices in schools; yet this mentoring is haphazard (Hudson, 2007). A conclusion drawn in one study involving 14 mentors (Hudson & Hudson, 2011a) suggested that educational research uncover strategies associated with mentoring pedagogical knowledge practices to assist mentors in their roles. Figure 1 outlines pedagogical practices for teaching in the classroom and will be summarised in the following three paragraphs as the framework for this study (see Hudson, 2004, 2007, 2010).

[Figure 1 near here]

Theoretical framework: Pedagogical practices

Effective teachers aim to meet their education system requirements and ensure teaching is purposeful and transparent through their teaching plans. Although experienced teachers devise curriculum programs focused on the presiding syllabus, preservice teachers, in their

formative stages of development, are required to produce lesson plans to indicate the teaching intent, lesson direction (e.g., activities, teaching strategies, assessment), and management of the learning environment. Effective mentor teachers are considered experienced in planning for teaching (Jarvis, McKeon, Coates, & Vause, 2001), which also entails timetabling and scheduling of lessons, and can provide further insights into how their schools devise teaching plans. In the primary school, such timetabling would include determining when in the school week the various subjects are taught, as this is generally a professional judgement. For secondary schools it involves scheduling when to teach particular content during the school term.

Effective teachers are well prepared with plans, resources, and knowledge of what, when and how to prepare for teaching (Tankersley, 2010; Williams, 1993). Different lessons can require different preparation, particularly with the range of subjects taught by a teacher in the primary school, and such preparation may not be apparent to a preservice teacher without explicit questioning or explanations from the mentor. The use of teaching strategies allows the teacher to structure learning environments appropriate to the age, level, type of lesson, and content knowledge (Bernard, 1989; Lingard et al., 2001). Content knowledge is crucial for teaching any particular subject matter in the classroom (Ball, Thames, & Phelps, 2008) and a teacher's content knowledge can be a predictor of student achievement (Hill, Rowan, & Ball, 2005), consequently, the importance of a preservice teacher having content knowledge before teaching cannot be undervalued. Indeed, an effective mentor teacher can articulate to the preservice teacher applicable content knowledge for a lesson and where they sourced this content knowledge. Regardless of the subject area, a key aspect of mentoring is ensuring the preservice teacher has proficient content knowledge for teaching a lesson (Perry, Hutchinson, & Thauberger, 2007). Checking the mentee's content knowledge before teaching may also avert learning inaccuracies for which mentors and university advisers need to take dual

responsibility (Youens & McCarthy, 2007).

Problems can arise in any lesson, including resource and student management, which requires "thinking on one's feet", that is, problem solving in action. Problem solving aligns with Schön's (1983, 1987) reflection-in-action with the notion that changes are made when in the process of teaching that aim to facilitate more effective learning. Furthermore, classroom management can be a priority issue for preservice teachers (Bates, Ramirez, & Drits, 2009; Burton, Weston, & Kowalski, 2009), consequently, the mentor's knowledge of the students, existing values and attitudes with rules and procedures, and understandings about specific students' needs and the wider socio-cultural contexts can be used to guide the preservice teacher's development of classroom management.

Teachers guide their students' learning through astute questioning that considers the students' learning levels and needs (Carr, 1998; Tobin, 1987; Wragg & Brown, 2001). The mentor's knowledge of how to structure a lesson (e.g., stimulating introduction to the topic, the body of the lesson presents a hands-on activity, and the lesson conclusion capitalises on determining student learning of the topic through verbal, written, pictorial or other forms of communication) also considers the student context to assist the mentee's teaching. Learning must be assessed to determine students' new understandings from what was taught (Corcoran & Andrew, 1988; Jarvis et al., 2001). An effective mentor will show how pedagogical knowledge practices are interconnected, including assessments for teaching and learning (e.g., Palmer, 1998; Tankersley, 2010). Finally, every mentor has experiential viewpoints about teaching that can add value to the mentee's learning experiences (Hobson et al., 2009). These viewpoints can include personal teaching philosophies that underscore the teacher's practices; hence sharing viewpoints about teaching can provide mentees with insights into pedagogical practices unique to particular contexts. It should be noted that differentiating the

curriculum and addressing students' needs (e.g., Leavitt, 2007) underpins the pedagogical knowledge practices outlined in Figure 1.

Although many preservice teachers claim their mentoring was random and haphazard (Hudson, 2004, 2007), mentors also report that the mentoring they provide is variable. For example, data collected from mentors in a study by Hudson (2010) and displayed in Table 1 illustrates how mentors evaluated their mentoring of pedagogical knowledge to preservice teachers for teaching primary science and primary mathematics. In particular, mentoring classroom management appeared as the most frequently mentored practice in each subject area while mentoring content knowledge, problem solving and viewpoints occurred least frequently. Interestingly in Table 1, mentors agreed that mentees received more mentoring in mathematics than science, probably because mathematics has more teaching time allocated within the weekly timetable in the primary school.

The haphazard nature of mentoring (Table 1), emphasises the need for mentors to be provided with practical strategies that can guide their mentoring of pedagogical knowledge. Thus, the research question for this study is: What are strategies for mentoring pedagogical knowledge practices?

[Table 1 near here]

Data collection methods and analysis

This qualitative research was conducted at a Queensland university, where twenty-seven mentor teachers were involved in a professional development program titled "Mentoring for Effective Teaching (MET)". This program emerged from an Australian Federal Government grant titled "Teacher Education Done Differently (TEDD)", which focused on linking university theory to school-based experiences for preservice teachers to conceptualise theory-practice connections (see Hudson & Hudson, 2011b) Participants were engaged in the three-

day MET program facilitated by the author and another academic staff member. Participants were involved in social discourse around a range of topics, such as: (1) Mentoring and the mentor-mentee relationship, (2) School culture and infrastructure, (3) Hudson's mentoring model (i.e., personal attributes, system requirements, pedagogical knowledge, modelling, and feedback; Hudson, 2010), (4) Problem solving, and (5) Action research for enhancing mentoring and leadership practices. Each topic was presented through interactive activities that utilised teaching strategies to maximise participation. For instance, participants used whiteboard markers to brainstorm strategies on laminated A3 diagrams of pedagogical knowledge practices (see Figure 1). In addition, they were provided with individual response sheets related to the pedagogical knowledge practices.

There were 26 females and 1 male with 18 of them aged between 30-49 years and 5 older than 50 years of age. Only 3 were between 22-29 years of age. All had mentored more than one preservice teacher previously with 24 who indicated they had mentored more than 5 mentees with some more than 20 mentees. Six participants had been employed in teaching between 6-10 years and 20 participants had worked in the education system for more than 10 years. There was one participant only who had worked in the education system for less than 6 years. These participants were taken through the MET program with an expectation that they will facilitate this program in their own schools, as a train-the-trainer model. As a result of this study, subsequent MET programs were condensed to two days for school implementation with considerable success (Hudson & Hudson, 2011b).

In particular, this research study aimed to investigate mentors' strategies that can be used to facilitate pedagogical knowledge in the mentee. The session involving pedagogical knowledge occurred on the first day of the MET program and lasted approximately 70 minutes. The researcher facilitated the data collection process so it was important to reduce researcher bias by having another academic and the research assistant present. Audio data

were collected from whole group and smaller group (i.e., 4-6 participants) discussions on

pedagogical knowledge using digital recorders set up by a research assistant who had a PhD.

These recorded dialogues were transcribed (by the research assistant) and analysed for

discourse relating to communicating pedagogical practices to mentees. In addition,

participants collaborated in small groups to write strategies on laminated materials, which

also facilitated discussions on the pedagogical knowledge practices (see Figure 1). All written

materials were transcribed and collated within the aforementioned pedagogical knowledge

practices. The university ethics committee and state department of education provided

approval for this study, and informed consent was gathered from principals of schools and the

participants involved in the study. The analysis of data occurred within the previously stated

pedagogical knowledge practices, where responses were used to present strategies for

mentoring and as the data collection concluded with a whole group discussion, a summary

consensus of the mentoring strategies was included at the end of each pedagogical knowledge

practice. Participants were provided with opportunities to consider strategies for other

pedagogical knowledge practices for teaching in the classroom that may exist outside this

framework.

Results

The strategies articulated by the study participants for mentoring pedagogical knowledge to

preservice teachers during their professional school experiences will be discussed in turn

following the theoretical framework outlined earlier.

Planning for teaching

These mentors suggested various strategies for mentoring about how to plan for teaching. It

was articulated clearly that mentors need to "show the preservice teacher examples of the

mentor's [teacher's] planning" with consideration of the "different yet equally important tiers

of planning" (e.g., teacher's plans, school plans, district, state, and national plans). It was deemed important to explain "how to integrate key learning areas effectively and efficiently", linking "curriculum documents and longer term visions" with ways to sequence and time lessons. Although "different teachers have different approaches", these mentors agreed that an effective mentor "builds in opportunities for cooperative planning with the preservice teacher" around "meaningful non-superficial learning experiences". One mentor suggested "providing the preservice teacher with a planning template", while several mentors presented the need for making "timetabling decisions explicit and transparent" in the planning. Furthermore, it was highlighted that the mentor can seize opportunities to "reflect with preservice teachers on success of their planning in relation to their lesson delivery". Indeed, there was consensus that the mentor and mentee should "plan cooperatively and reflect together afterwards". Other strategies included planning for differentiated learning with consideration of student contexts, mentors' modelling and articulation of planning, and allowing the mentee to experience planning. Specifically, it was outlined that mentors can assist by discussing school, state and national curricula, their planning methods, and guiding the mentee's development through collaborative planning. It was noted that preservice teachers need to take responsibility for their learning (see also Perry, Hutchinson, & Thauberger, 2008), particularly as many documents are now readily available online.

Timetabling (scheduling) teaching

Timetabling and scheduling of lessons was noted in relation to "syllabus expectations" with the "required hours of teaching of key learning areas". One mentor suggested having discussions with the mentee and making "explicit the theory behind timetabling of daily activities [for example] to utilise teacher aids, transitions, sugar levels and snack breaks, and developmental considerations, e.g. younger children → fatigue and concentration" (arrow

included). Timetabling issues around "playground duty rosters" and "outlining expectations that preservice teachers attend duties to develop relationships with students, staff, etc" were identified as important. Yet it was noted that school environments have other activities that may interfere with the timetabling and so mentees need an "awareness of impacts on the classroom timetable". Timetabling lessons needs to be linked carefully with planning structures and as such lessons can be divided into allocated times, hence, "understanding that each lesson has an intro/body/conclusion and activities can be structured for each time frame". Discussions as a whole group concluded that mentors can assist their mentees by: outlining that timetabling necessitates knowledge about syllabus requirements for allocated teaching durations; presenting the theory behind timetabling subjects (in the morning, afternoon or particular times during the week); and, explaining the impacts of extra-curricula activities on the weekly timetable.

Preparation for teaching

These experienced mentors strategised on how to mentor about preparing for teaching. They explained that research about the teaching topic, modelling of preparation for teaching, and providing examples of teaching preparation were considered effective strategies. It was considered important that mentors "provide them [mentees] with a realisation that organisation is the key". It was outlined that mentors need to "ensure preservice teachers are aware of resource locations, ordering supplies, have access to photocopying machine, etc" and "stress being flexible with prep materials, right tool for the right task". It was also emphasised that lesson plans should reflect preparation outlines, with a responsibility to develop plans in advance for ensuring preparation of resources yet "lesson plans must be flexible". These mentors emphasised that mentees need to know the "context", "what you are teaching", and "the strengths and weaknesses of the students". These mentors suggested that

it takes a community of mentors to develop a preservice teacher's practices, and they will require "samples of good practice in terms of planning and preparation from a variety of staff". In summary, the mentors concluded in the group discussion that they can assist the mentee to select teaching strategies that include consideration of resources for differentiated learning, showing where resources are located, and discussing the need to manage and be flexible with resources.

Teaching strategies

Focused group discussions outlined the need to be current with teaching strategies, particularly as research about teaching strategies presents strategies that are effective for specific contexts. Indeed, these experienced mentors presented a plethora of teaching strategies from "productive pedagogies" (see Lingard et al., 2001), cooperative grouping strategies (Bernard, 1989), and the use of specific resources to facilitate teaching (e.g., Information Communication Technology). It was explained that mentors need to "model strategies and articulate to the mentee what strategy is being used, why it is being used and other contexts to use it in" with discussion about "tacit/subconscious strategies with preservice teachers for variability, inclusion, task expectations, transitions, language, etc". Once more, the notion of drawing upon a community of mentors was emphasised, where mentors can "allow preservice teachers to work with and observe a variety of different teachers". Through the learning process, it was highlighted that mentees must experience teaching using a variety of strategies and be "encouraged to take risks, to try new strategies in a safe environment". It was explained to the whole group that mentors can assist their mentees to select teaching strategies by discussing student contexts and their needs, modelling the varied uses of teaching strategies, and allowing mentees opportunities to test out a range of teaching strategies.

Content knowledge

During the focus-group discussions, mentors were adamant about "staying up to date with personal content knowledge" through "careful consideration of the content explicitly identified in syllabus documents", "access to a resource person within a school" and "evaluating websites for credibility; Is the content correct and up to date?" They clearly emphasised the need for mentees to "ensure content is relevant to interest, experiences, etc. of students" and that it "caters for a variety of learning styles to acquire/access content". Indeed, a teacher's content knowledge may well be a predictor of student achievement (Ball et al., 2008). It was stated that, when time allowed, mentors could "encourage preservice teachers to demonstrate practical activities before they have to teach [the students] and to rehearse explanations that could be confusing". These mentors agreed that they can share their content knowledge with mentees prior to teaching lessons, however, they also highlighted a "shift in thinking that teachers having to be the source of all knowledge, shift to knowing how/where/who to access knowledge". So it was argued that mentees can "be responsible for their own learning, fill the gaps" by "reading widely" and "researching" though mentors also need to support their learning as mentees "don't know what they don't know". Apart from consideration of differentiated learning and discussions with the mentors about content knowledge, the mentors appeared in consensus that they can assist mentees by guiding them towards syllabus documents and showing them how to validate content knowledge from other sources (e.g., Internet). Checking content knowledge with the mentee can emphasise demonstratively this much needed pedagogical practice (e.g., Shulman, 1987) and importantly a teacher's content knowledge can have an effect on student learning (Hill et al., 2005).

Problem solving

Mentees need experiences for understanding how to problem solve during a lesson for which one mentor wrote that mentors can reflect on their own practices and "explicitly explain how you thought on your feet during a lesson the mentee observed" in order to guide the mentee's thinking along those lines. Another mentor provided four methods for problem solving with preservice teachers, viz: (1) allow trial and error to develop problem solving capabilities, (2) develop pre-emptive thoughts with one's best estimate of a situation, (3) work backwards to solve the problem, and (4) simplify the problem so it becomes more manageable. As preservice teachers are commencing their learning as teachers in the classroom environment, they will require more experiences to develop problem solving skills (Schön, 1983). Hence, it was stated that mentees need a range of contexts (e.g., debates and class meetings, experiments, games, role play, open-ended questions, and co-operative learning environments) in which to develop these skills. It was also clear from their comments that Schön's (1987) reflection-in-action was a requirement for problem solving while teaching. However, one mentor wrote, and it was agreed upon by others, that enlisting the assistance of other mentors can "help preservice teachers to network in a professional learning community and to draw on others' knowledge and expertise to assist in problem solving". In sum, these mentors outlined that they can assist their mentees to problem solve by explaining their own problem-solving techniques and encourage their mentees to develop pre-emptive thinking on possible problems that may require solving during a lesson. This may lead towards deeper analysis, in the way that action research can be used to problem solve (Green & Brown, 2006).

Classroom management

Effective and efficient classroom management appears fundamental for effective teaching,

particularly by ensuring students exhibit acceptable behaviours (e.g., Bates et al., 2009; Burton et al., 2009; Martin, Linfoot, & Stephenson, 1999). Mentors agreed that in the first instance, the preservice teacher must have a clear understanding of what constitutes acceptable and unacceptable behaviour so that expectations are established accordingly to "deal with inevitable good and poor behaviour". This would require mentors to "ensure the preservice teacher is aware of classroom and school behaviour management policies". Although schools can have school behaviour management policies, classroom teachers mould and shape the policies for implementation within the specific classroom context and with consideration of individual students' needs. Mostly, preservice teachers enter field experience at various points within the school year without knowledge of how the classroom expectations (and positive teacher-student relationships) were established by the mentor teacher earlier in the year. Hence, it was considered important for mentors to outline how "expectations were set out for students in the first weeks of [the] school year" and what was needed for establishing classroom management expectations (e.g., "routines and procedures, rules and consequences, positive rewards, responsible behaviour plans for students, individual behaviour support plans"). Other mentor actions were presented as ways for the mentee to develop an understanding of classroom management, namely: "share your love of the subject", "develop an interest in the students, work to establish some rapport", have a "list of strategies for different students", and aim to "work within the ethos/culture of the school, follow the pastoral model/restorative justice". It was articulated that preservice teachers must "keep the balance between acknowledgement and correction" with an understanding of "the differences between proactive and reactive strategies". These mentors highlighted that sound planning to engage students and "procedures to enhance learning engagement" provided proactive measures for facilitating learning. Thus, mentors suggested helping preservice teachers to become aware of such proactive strategies and procedures, and demonstrate how

to incorporate them into lesson planning and delivery. Behaviour management is an issue for many preservice teachers (and teachers) that necessitates a bank of strategies (e.g., see Burton et al., 2009), and mentoring classroom management practices with critical self reflection has been shown to improve preservice teacher actions towards creating teaching success (Bates et al., 2009).

Questioning skills

There was a general response from the mentors in this study that each pedagogical knowledge practice must include modelling and reflecting with preservice teachers to assist their understanding of these pedagogical practices. This was also the case with questioning, where it was suggested that the mentor can "model and reflect with the preservice teacher on different types of questioning, important aspects of questioning and how to deal with answers constructively". As there are many forms of questioning, mentors in this study discussed how to expose mentees to a variety of questioning strategies such as: "think-pair-share, open-ended questions, car park questioning, student generated questions, using questions and their answers to determine the direction of the lesson, using questions to generate inquiry, hands-down questioning" and "using Bloom's taxonomy to challenge students appropriately". Yet, it was emphasised that mentees need to "consider why you are asking a question – assessing understanding, genuine inquiry, brainstorming"; therefore mentors can discuss how key questions must be prepared in advance with consideration of how these questions will be distributed to the class and individual students. Preservice teachers are in their formative stages of development and may not understand how to "give students thinking/wait time" and carefully "listen to students' responses and assess for understanding", thus it was emphasised that the mentor has a vital role in guiding the delivery of questions and assessing students' responses. It was suggested that the mentor can allow the mentee to observe questioning

techniques from other experienced teachers towards determining effective questioning strategies, particularly as effective oral questioning is a fundamental teaching tool, which requires development and refining through a mentoring process (Ralph, 1999). Most importantly, it was outlined that the mentee needs opportunities to trial questioning strategies with a mentor willing to engage in professional dialogue about the effectiveness of such strategies. It was also explained that engaging in professional dialogue with the mentor can assist the mentee to re-think questioning techniques and methods of distribution.

Implementation of the lesson

These mentors articulated the complexities for implementing a lesson. These mentor teachers explained how they can "consider with the preservice teacher the importance of the learning environment [such as] lighting, sound, heat, physical set up of room" to ensure lesson implementation is conducted under optimal conditions. They believed that "explaining lesson content and structure" and making explicit the "link to previous learning given to students" would aid preservice teachers in lesson implementation and their understanding of "formative assessment by teacher to determine pick up point for a subsequent lesson". It was suggested that exploring the implementation of activities through individual, paired, small group work and whole class arrangements along with an understanding of "catering for different learning styles – visual, audio, kinaesthetic", using appropriate "technology – interactive whiteboards, PA systems", and establishing "the pace of the lesson" would assist the preservice teacher to formulate a more implementable teaching plan. Yet, it was stressed that the mentor can "ensure the preservice teacher is aware of the need for flexibility, extension ideas and backup plans". These experienced mentors (n=27) highlighted that modelling and reflecting on teaching practices with open and constructive discussions were strategies that scaffold essential pedagogical knowledge for implementing a lesson. There was also discussion about

the intended and enacted curriculum where mentors and mentees can deliberate over the "difference between planning and actual implementation". Furthermore, implementation requires differentiation to address individual student needs, thus the mentor teacher can assist the mentee to understand lesson implementation by discussing "how and why you [the mentor] are differentiating". In sum, mentors can develop their mentees' implementation skills by discussing the physical classroom conditions, the lesson structure and timing, the use of prior knowledge, and the links to other pedagogical knowledge practices (e.g., planning, preparation, teaching strategies, and assessment).

Assessment of student learning

The mentors explained that the fundamental principles behind assessment must be made clear to their mentees, particularly the need for "sharing goals and success criteria with students" and assessment as a "learning tool". All mentors agreed that it was important to outline the lesson intent with explicit success criteria and "explain the aims of peer and self-assessment, reflective journey, and that students need to be taught these skills". The mentors agreed that showing "different types of assessment to preservice teachers - formative, summative, running records" with authentic applications and "modes of record keeping and their uses [such as] portfolios, reporting, daily notes, taking action, data analysis" can assist the development of assessment techniques. These mentors signalled the use of teacher and student-generated questioning to "check for understanding" as a method of formative assessment. In terms of summative assessment, mentors suggested that discussions with the mentee about "an overview of assessment 'big ideas' and models of design processes involving assessment (e.g. understanding by design) would be useful, along with "de-constructing an assessment task in order to isolate key concepts, what do students need to know?" Once more, mentors claimed it was essential for the mentor to "explain how and why

to differentiate assessment – modes and times", which could be further developed by "include[ing] preservice teachers in moderation meetings that provide consistency across all classes in year level". It was indicated that even though an effective mentor will check assessment plans with appropriate feedback, the mentee must learn to take responsibility for devising assessment by "reviewing research on high quality assessment". Hence, these mentors highlighted that they can use the following strategies to develop the mentee's assessment practices: outline syllabus links with explicit success criteria, present a rationale for assessment, ensure careful selection of assessments associated with differentiated learning, and allowing mentees to learn from other school staff about their assessment techniques. Importantly, developing a mentee's understandings of how assessment connects to the other pedagogical knowledge practices (Figure 1) can aim at a more holistic development of the mentee's practices.

Viewpoints for teaching

It was clearly stressed that, similar to teachers having their own teaching styles, mentors too are individual in their mentoring approaches. The mentors stated that they needed to articulate their pedagogical viewpoints and engage preservice teachers "in professional conversations in a safe environment", where mentors can draw upon "personal experiences" and "philosophies of teaching". This may lead to discussing "various educational paradigms, agendas (federal, state, school), and historical views of education" or "play[ing] devil's advocate" with "a statement to promote debate with the mentee". It was also written and agreed upon that mentors should "ensure preservice teachers are aware of socio-political viewpoints of school and its individual members". One mentor wrote, "encourage preservice teachers to read widely in the professional literature" to gain viewpoints about teaching and "get preservice teachers to justify professional decisions". In the group discussion, the

mentors outlined that whether pedagogical viewpoints are about "classroom management", "backward mapping" or "vocal usage (classroom volume), vocal delivery", listening and rationally discussing other's philosophical ideas was crucial for professional growth (see also Howe, 2006).

Summary

As summarised in Table 2, the experienced mentor teachers in this study presented strategies aimed at scaffolding the mentee's pedagogical knowledge practices. Table 2 presents a collection of strategies signalled by one or more mentors and with consensus from the whole group. Furthermore, these mentors articulated and agreed upon strategies considered to be applicable to all the pedagogical knowledge practices. For example, students arrive at school from a range of diverse contexts, including socio-economic circumstances, cultural backgrounds, religious beliefs and so forth. Each class will have its own unique set of student contexts for which the experienced teacher in the mentor role can outline to the mentee for the purposes of developing teaching practices. Differentiation requires teachers to understand these contexts that also include students' abilities and disabilities with their varied learning dispositions in order to tailor pedagogical knowledge for the specific classroom context. It was acknowledged strongly in this study that mentors need to not only articulate the pedagogical knowledge practices but also model (e.g., Bandura's vicarious experiences) and reflect on these practices with their mentees (Schön, 1983, 1987; Table 2). Mentors need not be threatened by the possibility of modelling unsuccessful classroom practices, particularly as lessons can deviate from the intended plan even for experienced teachers, but instead mentors can demonstrate how the reflective process works by engaging the mentee with open and honest critical self reflection. Furthermore, mentors vary in how much time they allocate to the mentees for teaching a class, yet the participants in this study highlighted that mentors must allow adequate teaching practice for mentees to gain mastery experiences (Bandura,

1977; Shulman, 2000) and multiple opportunities for mentees to reflect on their own practices (Schön, 1983). This may be viewed as a three step process, namely: (1) a pre-action of the mentor modelling these practices, (2) a present time action of the mentee experiencing these practices by teaching, and (3) a post-action of reflecting on the practices. In addition, it was viewed that preservice teachers can gain from interactions with other school staff across all of these pedagogical practices. A community of mentor teachers have their own unique classroom contexts and can present different viewpoints that can help to broaden the mentees' perspectives on how to develop and implement pedagogical knowledge practices.

[Table 2 near here]

Conclusion

In this study, mentors outlined strategies for developing preservice teachers' pedagogical knowledge practices. There were several or more practical strategies suggested for each mentoring practice associated with pedagogical knowledge. Some strategies aimed to dig deeper into the practice while other strategies provided a broader perspective. For example, mentoring strategies associated with a big picture view of planning for teaching included showing examples of the mentor's teaching plans (e.g., teacher's program) with the interconnecting tiers of planning (e.g., class, school, state and national plans). Strategies for deeper learning about planning included co-planning and reflecting verbally on planning with the mentee by deliberating on the specific learning needs of students. Assessment for learning, as another example of the breadth and depth of mentoring, showed how mentors can focus on the theoretical underpinnings of assessment by analysing models of assessment designs including formative, summative, and peer and self assessment yet also deconstruct assessment tasks where key concepts learned are analysed through criteria-referenced rubrics. The broad picture strategies presented ways to understand current thinking about pedagogical

knowledge practices while the deeper, more focused strategies targeted individuals and contextual situations. As shown previously (Hudson, 2010), mentors' articulation of pedagogical knowledge practices is variable, necessitating a framework to guide their mentoring practices. Other studies show that the mentoring framework benefits inexperienced and experienced mentors (Murray et al., 2011), and improves the quality of the mentoring experience for mentees (Hudson & McRobbie, 2004); hence devising strategies within this framework may assist mentors in their practices.

This study was conducted to gather mentoring strategies for developing the mentee's pedagogical knowledge. The 27 participants were experienced mentors who were asked to draw upon the practicalities of their own mentoring experiences for presenting mentoring strategies aligned with pedagogical knowledge. These participants were generalist primary teachers, consequently, their mentoring strategies were deemed applicable to all key learning areas in the primary school. There were limitations to this study. First, these experienced mentors were asked about strategies within an existing framework. Second, although mentors recorded their strategies individually, in pairs, small focus groups, and these were discussed as a whole group (class) to reach consensus on the strategies, it cannot be ascertained that all mentors agreed with all strategies. A follow up Likert survey where the strategies were presented and mentors asked to anonymously record their agreement/disagreement of the strategies would assist in determining consensus. Mentors were provided with opportunities to discuss practices outside the pedagogical knowledge framework but no other practices were suggested; however strategies suggested tended to fit within the existing practices. Some reasons may include: the exhaustive discussions about mentoring pedagogical knowledge and hence limited motivation for further input; an understanding of the broad application of these pedagogical knowledge practices; and the need for a break. Using the framework provided scope to discuss and unpack mentoring strategies for effective teaching

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but at the same time it may have limited the scope for providing other strategies. With a focus on mentoring for effective teaching, further research can be conducted by other researchers that allows mentors to present strategies without a framework and then determining where these strategies may or may not fit within the framework, which also can indicate where other practices and strategies may reside. There are research opportunities for understanding whether there is an order or hierarchy of strategies, which can present more sequential ways for scaffolding the mentee's learning.

The pedagogical knowledge practices used in the framework for this study are interconnected empirically and statistically (Hudson, Skamp, & Brooks, 2005). Hence, planning for teaching is connected to timetabling, preparation, classroom management, assessment and so forth. To illustrate further: developing effective questioning skills (e.g., Bloom's taxonomy, Blank's levels of questioning, open and close questions, wait-time) was deemed to facilitate classroom management, particularly as appropriate questions requires active listening towards engagement in the learning process (Ralph, 1999). The suggested strategies do not rely solely on one mentor (see for example Glazer & Hannafin, 2006). Although many of these strategies included reflecting on the pedagogical knowledge practices with mentees, they included input from other teaching staff (e.g., moderation meetings across year levels and discussing with other teaching professionals). Similar to the adage "It takes a village to raise a child", it takes a community of mentors to professionally shape a quality teacher.

Notwithstanding the onus on employers to take active roles in mentoring their employees to system standards, the mentors in this study placed significant responsibility for learning to teach on the learner. Despite extended periods of time spent in schools during a preservice teacher's four-year degree, it was outlined that mentees, as adults who will eventually enter a profession that cares for students and their learning, must learn to take

responsibility for their pedagogical development if they are to reach optimum professional levels. Preservice teachers are largely at a dependency stage when they first enter a mentor teacher's classroom but in the mentoring process will need to communicate effectively with their mentors, aim for accuracy self-reporting about their pedagogical practices, and be open to the mentoring process (e.g., see Roehrig et al., 2008). It is argued that effective mentoring and the mentee's self responsibility for learning can guide the mentee towards an independent stage nearing the completion of the teaching degree. Indeed, if mentees do not take responsibility for their learning then mentoring may lose its effectiveness. Of course, preservice teachers will be at different stages of development; consequently some may continue to be largely dependent while others may well exceed the independency stage towards an interdependency level as they exit the university degree.

It was clear that school students were at the centre of these pragmatic mentoring strategies, as each pedagogical knowledge practice had varied strategies that focused on students. To illustrate, classroom management strategies focused on providing students with clear expectations through existing school policies, implementation strategies honed in on student learning styles, and assessment strategies brought forward authentic assessment techniques relevant to student learning. It is inferred that learning about these actions may lead towards reducing classroom management issues and increasing learning potential. Similarly, differentiated learning appeared central to the mentoring strategies, offering ways to more effectively target individual students. For instance, differentiation was noted in the planning for individual students, preparing resources with consideration of individual student needs, and listing behaviour management strategies for different students. Ultimately, and at the micro level, mentoring aims to improve student learning through well-developed teaching practices; however there is no research that identifies how professional development for the mentor (macro level) transfers to mentoring preservice teachers in the classroom (meso level)

that finally translates to student learning outcomes (micro level). Critically, research needs to uncover the mentoring practices that lead to student learning outcomes.

In summary, the experienced mentors in this study presented strategies that can be used by mentors to facilitate mentees' development of pedagogical practices. It appears that mentors need to have a repertoire of pedagogical knowledge strategies that they can draw upon to guide the preservice teacher's development. This is not a definitive list of strategies but rather a bank of strategies to assist mentors in considering a differentiated mentoring curriculum focused on the individual needs of mentees. Mentors and mentees must discuss pedagogical knowledge practices to ensure they are on the same page for the mentee's development of effective practices. A differentiated mentoring curriculum would be flexible with a vision and clear aims for achieving state and national teaching standards appropriate to the mentee's level of proximal development.

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Table 1. Mentors' Self Reporting on their Mentoring of Pedagogical Knowledge in Primary Science and Mathematics

Mentoring Practices	Mentors	
	Science (*n*=29)*	Mathematics (*n*=43)*
Assisted in planning	79	90
Assisted with timetabling	72	91
Guided preparation	77	95
Assisted with teaching strategies	72	91
Discussed content knowledge	69	65
Discussed problem solving	52	68
Assisted with classroom management	86	98
Discussed questioning techniques	76	72
Discussed implementation	76	91
Discussed assessment	79	84
Provided viewpoints	52	65

* Percentage of mentors agreeing that the specific mentoring practice occurred (Hudson, 2010).

Table 2. Summary of Strategies for Mentoring Pedagogical Knowledge Practices

Pedagogical practices	Particular strategies for pedagogical knowledge practices			Strategies applicable to all practices
Planning	Levels of planning (e.g., school, state, national curricula)	Planning approaches (e.g., show examples, templates)	Collaborative planning	Student contexts
Timetabling	Syllabus allocation requirements	Theory behind timetabling subjects	Other impacts (e.g., duties, extra curricula)	Differentiated learning
Preparation	Location of resources	Flexibility with resources	Managing resources	Mentor modelling of practices
Teaching strategies	Varied teaching strategies	Inclusivity of teaching strategies	Experimenting with teaching strategies	Mentor articulation of practices
Content knowledge	Content knowledge from syllabus and research	Validation of current knowledge	Rehearse articulation of content knowledge	
Problem solving	Explanations of problem-solving techniques	Pre-emptive thoughts in a range of contexts	Assessed risk taking for solving problems	Allowing mentee to experience practices
Classroom management	Policies, planning, proactive and preventative	Expectations and behaviour management systems	Enthusiasm for the subject	Reflection on practices
Questioning techniques	Levels of questions (e.g., Bloom's taxonomy) and variations of strategies	Rationalising questions	Directing questions equitably for assessment	Interactions with other school staff
Implementation	Physical classroom environment	Lesson structure, pace and timing	Inclusion of prior knowledge	
Assessment	Syllabus links and success criteria	Rationale for assessment (e.g., learning tool)	Types of assessment and record keeping	Links to other pedagogical knowledge practices
Viewpoints	Philosophies of teaching	Socio-political, socio-cultural	Reading/interacting with an open mind	

NB: Strategies for mentoring pedagogical knowledge practices in Table 2 were indicated by one or more mentors and agreed upon by the whole group.

Figure 1. Pedagogical knowledge practices for mentoring