

Mentoring pre-service teachers on school students' differentiated learning

Peter Hudson, Queensland University of Technology, Australia.

Contact Email: pb.hudson@qut.edu.au

Abstract

This Australian study explores the mentoring of pre-service teachers in selecting and implementing teaching strategies to meet students' learning needs. Two case studies involving 28 mentor teachers in a professional development program and a mentor-mentee partnership during a four week practicum provided data about mentoring teaching strategies for differentiated learning. Findings showed that contexts for learning about differentiation occurred at the pre-action, in-action, and post-action stages. Central to each stage were pedagogical knowledge practices such as planning, preparation, classroom management, assessment, and problem solving (reflection-in-action to present solutions to problems) as key to in-action strategising and the mentoring processes. Mentoring pre-service teachers on how to devise teaching strategies for differentiated learning needs to be researched with a wider range of mentors and pre-service teachers, including those at different stages of development.

Keywords: mentoring, teaching strategies, teaching approaches

Introduction

Pre-service teachers are in their beginning stages of learning about teaching strategies and meeting students' learning needs (i.e., differentiation). For instance, university coursework presents teaching strategies across different curriculum areas in a Bachelor of Education (primary). Such coursework explores theories behind teaching strategies and analyses school students as individuals who have specific learning needs. Connecting theory to practice remains a linchpin for pre-service teachers' understanding of effective teaching (Hudson & Hudson, 2011). Pre-service teachers have opportunities to learn about teaching strategies and how these are used in different situations with the challenges of real-world contexts. Importantly, schools can provide a vehicle for connecting theory with practice, and mentor teachers are considered pivotal to pre-service teacher development. Mentoring in this study is where a more experienced teacher facilitates the learning of teaching practices within a school context. Mentor selection occurs within Australian schools either voluntarily or through nomination by a school executive. There are conditions for effective mentoring such as: "(i) contextual support for mentoring; (ii) mentor selection and pairing; (iii) mentoring strategies; and (iv) mentor preparation" (Hobson, Ashby, Malderez, & Tomlinson, 2009, p. 211), for which Hobson et al. demonstrate that the context for mentoring surrounds the mentoring process. Noted as a large

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gap in the literature, this study explores mentoring for preparing pre-service teachers in selecting and implementing teaching strategies that differentiate school students' learning.

Literature review

It has long been apparent that students have different learning needs (Dewey, 1933; Vygotsky, 1986; Woolfolk & Margetts, 2010). Among other factors such as gender and physical circumstances, students' learning needs are largely based around social, cultural and academic parameters (Burton, Weston, & Kowalski, 2009; Snowman, Dobozy, Scevak, Bryer, Bartlett, & Biehler, 2009). Snowman et al. explain that drawing on theories of learning such as Gardner's multiple intelligences and Sternberg's triarchic theory (i.e., analytical, creative and practical) can assist teachers to devise alternative strategies for addressing students' diverse learning needs. Students' stages of development with reference to state syllabus requirements also guides teaching practices. For instance, a science syllabus may advocate potential and kinetic energy as appropriate for the learning needs of Year 6 students. However, such a group of Year 6 students may comprise of those who have learning abilities and disabilities with a wide academic range that can extend from Year 1 to Year 10 levels. Consequently, a teacher working through the prescribed syllabus will need to negotiate the challenge of differentiating the learning. Scott and Spencer (2006) emphasise that differentiation requires teachers to adapt the curriculum and use strategies to address students' diverse needs within a classroom.

Selecting appropriate teaching strategies can assist in catering for multiple learning needs in the classroom. Many authors (Bender & Ikechukwu, 1989; Coffey & Gibbs, 2002; Gardner & Hatch, 2004) show teaching strategies as a collection of organisational tools to manage students' learning. For example, the use of graphic organisers such as fishbone charts and Y charts abound as teaching strategies within education departments, texts, and websites, highlighting these structures as teaching tools (e.g., http://education.alberta.ca/media/831555/n_uklak32.pdf). Yet, teaching strategies extend well beyond the use of graphic organisers by focusing on context-specific situations. Effective teachers select strategies that are appropriate to the context of the student(s), which requires an understanding of how students' behave, work and think (Snowman et al., 2009). Determining and selecting appropriate teaching strategies require deep analysis of individual contexts within social environments. Targeting an individual student's intelligence (e.g., Gardner's multiple intelligences, Sternberg's triarchic theory, and Sternberg's mental self-governing styles; see Snowman et al., 2009) with consideration of gender equity, cultural inclusion and recognition of the preferred learning styles becomes a higher-order thinking challenge for teachers. Similarly, such challenges are placed on pre-service teachers during their professional school experiences.

Bradfield and Hudson (2012) conducted a study based on 16 second-year pre-service teachers' written observations of their mentors' teaching strategies for differentiated learning. Using the constant comparative method, participant responses on specific teaching strategies used by their mentor teachers were collated into four main themes, namely: (1) contexts for differentiated learning, (2) preparation and management of human resources, (3) management of students, and (4) preparation of resources as teaching aids. Their study concluded that contexts for differentiating the learning required flexibility with a range of locations, experiences (e.g., rotational hands-on activities, inside

and outside activities), and catering for students' levels of thinking. Although organising human resources included the teacher's instructions, observations and interventions, it also involved students enlisted as expert helpers, and support staff who can scaffold students' learning (Stein, Carnine, & Dixon, 1998). They show that classroom management of students presented as a strategy towards addressing students' learning needs, for example, grouping students together and managing their behaviour (Johnson, Johnson, & Holubec, 1993). Finally, they highlight that selecting and organising resources as teaching and learning aids (such as visual aids, auditory aids such as songs, rhymes, mnemonics, and games) were considered tools for engaging students within their learning needs. It should be noted that diagnostic assessment or prior knowledge questions can be used to determine students' learning needs. It appears that teaching strategies may be at the centre of effective learning, yet little is known about mentoring teaching strategies for differentiated learning.

This paper investigates the mentoring of Australian pre-service teachers in relation to selecting and implementing teaching strategies that differentiate students' learning. It analyses teaching strategies and how this may relate to pre-service teacher development. Pre-service teachers are at foundational stages with opportunities to develop teaching strategies for differentiated learning, which can be facilitated through university coursework and professional experiences in schools. This paper aims to show the importance of mentors' guidance within specific classroom contexts to develop pre-service teachers as well as negotiate the challenges of differentiating students' learning.

Theoretical framework

A mentoring for effective teaching model (Hudson, 2010) has provided a framework for mentors to engage in purposeful mentoring practices. This five factor model is statistically significant (Hudson, Skamp, & Brooks, 2005) and shows that the mentor's personal attributes surrounds the mentoring process with the mentor engaged in articulating system requirements, pedagogical knowledge and feedback. It also demonstrates how the mentor's modelling of teaching practices can aid the pre-service teacher's development. This current study draws upon the mentor's pedagogical knowledge as a framework for mentoring teaching strategies associated with school students' differentiated learning. Within the five factor model, pedagogical knowledge includes: planning for teaching, timetabling and timing teaching, preparation of resources, selecting teaching strategies, having appropriate content knowledge for student learning, problem solving, classroom management, questioning skills, implementation of the lesson structure, assessment of and for learning, and the mentor's viewpoints of teaching.

The mentor's role and the pre-service teacher's mentoring experiences can shed light on how to plan and implement strategies for students' differentiated learning. This study is framed around three proposed stages, namely: (1) pre-action, (2) in-action and (3) post-action. The pre-action stage occurs before the pre-service teacher (mentee) teaches that can include mentor-mentee interactions for learning how to plan and implement strategies for differentiation. The in-action stage involves the mentee in the role as teacher, implementing a planned lesson while the post-action stage incorporates interactions between mentor and mentee after a lesson.

The research question for this study was: What mentoring prepares pre-service teachers for selecting and implementing teaching strategies for students' differentiated learning?

Data collection methods and analysis

This interpretive study investigated mentoring and pre-service teachers' pedagogical development for teaching primary students. There were two case studies, viz: (1) 28 mentor teachers involved in professional development mentoring pre-service teachers, and (2) a final-year mentee and her mentor in a four-week practicum. University ethics approval and consent from participants were gained before commencing this qualitative study for which participants were given pseudonyms for anonymity.

Case study 1 included experienced mentor teachers ($n=28$) from different public schools who were involved in a two-day Mentoring for Effective Teaching (MET) professional development program that focused on mentoring pre-service teachers (see <http://tedd.net.au/mentoring-for-effective-teaching/>). They were audio-recorded within six focus groups (approximately four to five participants in each group) and provided written documents about effective teaching during this two-day period. During an hour session, these participants discussed effective teaching strategies and collated their responses on graphic organisers. They were asked to record responses to questions about their favourite teaching strategy, and when, why and how they use this strategy. To elicit open responses, differentiated learning was not mentioned specifically for case study 1, for instance, they were asked: What are the usual student outcomes when you use this teaching strategy? The purpose was to formulate a bank of teaching strategies as a reference point for mentoring pre-service teachers (see also Hudson, in press).

Case study 2 presented dialogues between an experienced mentor teacher and a final-year pre-service teacher (mentee) within a field experience held in a Year 1 public school. The mentor (Jenna) and mentee (Rebecca) operated a light-weight digital audio recorder around their necks, which allowed for ease of talking during formal and informal discussions (e.g., walking on playground duty or in a staff room). There were 45 audio-recorded dialogues (approx 3 minutes to 38 minutes in length) between the mentor and mentee during the four-week practicum period. The mentor and mentee were not asked to focus on teaching strategies or target students' differentiated learning for their discussions. Instead, the dialogues in case study 2 were intended to be a "natural" mentoring process where subsequent analysis of teaching strategies and differentiation could occur. The purpose was to understand the mentoring of pre-service teachers for selecting and implementing teaching strategies that differentiate learning needs. The fact that they had to use the digital audio recorders presented a caveat that they knew they were being recorded. Nevertheless, 45 recordings during the four weeks provided multiple opportunities for analysing data and the emergent issues pertinent to the classroom context. As a final-year pre-service teacher, Rebecca had successfully completed all units assigned to a Bachelor of Education (primary) degree with this practicum (used as data in this study) and a final internship as the last two units to complete. A unit in Australian universities is 12 credit points with four units (48 points) constituting a full semester load for university students.

Data from case studies 1 ($n=28$) and 2 (mentor-mentee) were transcribed by a research assistant with a PhD. For case study 1, a constant-comparative method was used to collate data into common themes (Yin, 2009), while in case study 2, dialogues between the mentor and mentee were available to exemplify the mentoring of teaching strategies used for differentiated learning. In this study, data were analysed according to the mentoring model framework (Hudson, 2010). Findings from the two case studies about mentoring pre-service teachers will be presented and analysed with further consideration of the pre-action (before teaching), in-action (teaching), and post-action (after teaching) stages to delineate broad time periods.

Findings and discussion

Case study 1

The mentor teachers ($n=28$) involved in the Mentoring for Effective Teaching (MET) program deliberated over teaching strategies they would articulate to guide their pre-service teachers' development. One focus group agreed that it was important to inform the mentees about differentiated planning and preparedness with explicit expectations as an essential formative strategy for establishing a productive and purposeful learning environment: "it's about being really well prepared and structured and again that setting up of expectations". Similarly, mentors agreed that in a pre-action stage, determining prior knowledge on a topic was considered strategic in the development of a learning program, as represented by one of the mentors, "So you need a question or a topic that you want them to think about and you put the butcher's paper around the room and they establish the rules then the students record their understandings on the butcher's paper". The discussion indicated that planning for differentiated learning required the teacher to think through strategies appropriate and effective to the grade level. Not surprisingly, it was indicated that there may well be many choices of strategies for any one lesson for which an effective teacher considers and selects appropriately for mentoring in the pre-action stage.

The context for differentiated learning was a focal point in all the teaching strategies discussed by the mentor teachers. After these mentor teachers wrote about effective teaching strategies, one mentor reported back to her focus group that she "had too many [strategies] so I went back to the essential skills". She outlined strategies such as "wait time for responding to questions" and providing "kids time to organise their equipment" but highlighted that this depends on the type of students in the class as "last year it probably wouldn't have worked at all with my kids but this year... yeah". This view was supported by others in this particular focus group, for instance: "I think it depends on your classroom which strategies that you use. Last year my class was a little bit more robust so I used extrinsic motivation". Nevertheless, all claimed they were "essential skills teachers" (see Queensland College of Teachers, n.d.) with the use of "parallel queuing", "identifying the specifics of what they're doing", and using intrinsic and/or extrinsic motivation techniques to engage learning. To assist the mentee in building a bank of teaching strategies, one mentor teacher suggested that in a pre-action stage the mentor can write for the mentee "a little quick reference kit with a repertoire of different or effective strategies that you've built up and also collected from other people". Although these mentors considered themselves time poor, it was emphasised that presenting mentees with teaching strategy choices can assist their teaching of the mentor's class.

It was shown repeatedly that strategies for differentiated learning required pre-action mentoring about classroom management, in which student behaviour management also was referenced considerably by these mentors. It was explained that students were at different learning levels (and engagement levels); hence differentiation required strategies to manage students at these levels. One mentor suggested explaining to mentees about “easy and simple strategies” with clear examples of these “tools of the trade” and how they work, such as:

catch me cards... I used to have a little cardboard card ruled up with little marks and any time I caught the kids doing something right, whatever it might be, you would have a stamper and you would just say ‘catch me’ and you’d just go stamp, stamp, stamp, stamp all the daylong. And the goal might be ten stamps and then you might negotiate computer time or it might be ten stamps and it might be a prize box. But it was really good because you could actually individualise it so if we’re using the example of a child who may be really disengaging you can actually catch them the minute they’re sitting up and they’re focused as many times as you need to you know throughout that day and really see their behaviour actually turn around.

These mentor teachers recorded and agreed upon many ways they could aid pre-service teachers in their development of teaching strategies at the pre-action, in-action and post-action stages of teaching. In the pre-action stage, they emphasised that it was important for the mentor 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” and “explain the benefits for particular lessons and/or KLAs [Key Learning Areas]”. The mentors stated that they needed to be more explicit about mentoring teaching strategies particularly at the formative stage of lesson development and how strategies can be applied within a lesson such as “explain the structure of a teaching plan and how teaching strategies can be used within the different stages of a lesson”. They recorded that mentors need to: “model productive pedagogies and reflect with pre-service teacher” and “consider tacit/subconscious strategies with pre-service teachers for variability, inclusion, task expectations, transitions, and language”. Similar to mentors modelling teaching strategies for mentees to learn how to teach, modelling a concept to students was considered a teaching strategy “because with the earliest philosophy you always model the new concepts... you’re demonstrating and then you’re using that discussion and constructive feedback through discussions to see if the kids have attained that concept”.

During the in-action stage, students are generally presented with instructions to engage in an activity after a concept has been modelled. This too requires a teaching strategy where “we’ll give instructions and then we ask them [the students] to repeat the instructions back to us”. It was discussed that checking for understanding of the task allows all students to be clear on the expectations and provides them with confidence for completing the assigned task. They debated on the importance of sharing views about how the teaching strategies worked during the post-action stage.

It was emphasised many times by various mentor teachers in this study that mentoring the use of teaching aids with visuals allows students to engage in the learning (Bradfield & Hudson, 2012). Auditory cues can assist to engage students as a class. It was indicated that teaching strategies had to be flexible during the in-action stage to cater for individual needs, for instance: “I’m adapting teaching” by making a song out of the concepts for them remember, and another teacher replied “little

kids particularly tend to find things easier to remember when you've got a musical tune about it". All mentors agreed that games can stimulate students' visual and auditory senses and engage them in learning by tailoring the game to suit the concepts, which also links to addressing individual needs (Gardner's multiple intelligences; Gardner & Hatch, 2004). Such strategies need to be articulated and modelled to the mentees during the pre-action stage, for example, a mentor teacher in this study said that she outlined a strategic game for learning to her mentee, which involved students asking questions about an object, associated with the lesson concept, concealed in an enclosed jar or box.

Mentor teachers needed to deconstruct their teaching strategies to understand what and how they may mentor in these areas. One mentor teacher highlighted that using appropriate teaching strategies can provide confidence for students to articulate their ideas with others in groups. For example, "I like using the think, pair, share thing, I use that a lot to ...for teaching kids how to be part of a group and how first of all you have to have your own idea because you can share with everyone else". Differentiating groups was noted as a strategy to maintain student engagement: "I ability group my kids because then if they're doing work at their own level, their own pace then they're less likely to get off task". Indeed, grouping students of mixed ability and streamlining the groups were strategies all mentors agreed should be used at different times to capitalise on differentiation, for example:

By the time you've got one group on your computers, one group on the floor doing something... you're sitting there on your chair with your small group, you can actually monitor and direct them all. It's an old one but it's a goodie.

Another mentor teacher outlined the use of rotational groups with engaging sets of activities: "literacy and numeracy rotations and they're so simple but to do four activities and whether or not you rotate in the fifteen segment or whether it's across four days, I know it's basic but... you can cover so much more than you can standing in front of a whole class". These rotational groups would be involved in hands-on activities to differentiate the learning, "so you know being those little kinaesthetic learners, tactile learners who like to get their bodies moving, let them move around", which relates somewhat to Gardner's multiple intelligences. As pre-service teachers also learn through first-hand experiences, these mentors recommended that in the pre-action stage they needed to "discuss the need [for mentees] to experiment with different teaching strategies" and "encourage the mentee to observe and explore a variety of teachers' practices to analyse teaching strategies". The pre-action stage can advance mentees' knowledge about teaching strategies by allowing "pre-service teachers to observe a variety of different teachers". Yet they also suggested that mentees need to take responsibility for developing teaching strategies by "keeping track of current research about effective teaching strategies". Here, the pre-action of modelling teaching strategies by the mentor was noted to provide visual signs to the mentee followed up by discussing the students' learning styles in the post-action stage to consolidate the teaching strategies used.

In summary, the mentor teachers emphasised that planning and preparedness with explicit expectations during the pre-action stage aids the process of differentiating students' learning experiences. They highlighted that in both the in the pre- and post-action stages that managing student behaviour needs to be included in differentiated learning along with the mentor's articulation and

modelling of teaching strategies that differentiate learning. The use of teaching aids, games and resources presented as tools that can assist in planning for rotational, hands-on experiences to facilitate differentiation during the in-action stage. As an imperative, it was strongly emphasised that pre-service teachers must be provided opportunities to reflect with their mentors during the post-action stage about their selection and implementation of teaching strategies for differentiated learning.

Case study 2

The mentor (Jenna) and final-year pre-service teacher (Rebecca) in case study 2 provided rich data through their mentor-mentee dialogues about teaching strategies for differentiated learning. Data on mentoring teaching strategies for differentiated learning were collated into themes using a constant comparative method, which indicated several mentoring actions around: (1) planning teaching strategies for differentiated learning, (2) implementing teaching strategies, (3) preparing and managing resources, (4) catering for groups of students, (5) problem solving in action, and (6) content knowledge. These themes will be explored in the following analyses.

Planning teaching strategies

The final-year pre-service teacher questioned Jenna, her mentor teacher, about planning differentiated learning activities during the pre-action stage. Despite being in her final year of a Bachelor of Education degree, Rebecca wanted clarity about planning differentiated learning for this particular class: “So normally when you do a whole class activity, would you try and plan something else for the ones that are really low?” Jenna outlined the practicalities of planning teaching strategies for differentiated learning and how to present lessons to the whole class. She also explained how to follow up with a focus group or individuals as opportunities for differentiating the learning, which the following pre-action dialogue illustrates:

Mentor: Your lesson is for everybody but there’s a particular group of children that you’re focusing on...

Mentee: Would I put that in differentiation?

Mentor: Not really because you’re not differentiating it for [the class]. Your differentiation would be for Jake and Robert [pseudonyms] but it’s more a focus group. And you won’t always have someone in that section, sometimes you’ve just written a whole class lesson.

Mentee: ...so do you mean for example with your reading groups, you might be focusing on something that say the tens and elevens need to do.

Mentor: Yes.

The mentor provided advice on how to differentiate Rebecca’s planned activity while reviewing her literacy lesson plan during the pre-action stage: “And so when you introduce that book to them, make sure to call James up and ask him to tell you what the numbers are, what’s this one, because that’s your differentiation fully then because he has to be able to recognise those numbers now” (Mentor). The mentor guided the mentee on teaching content knowledge to an individual student by using the strategy of “checking for understanding”. This also became a method of diagnostic assessment for this particular student to help the teacher cater for individual differences. These mentor-mentee interactions demonstrated that the final-year pre-service teacher required advice and direction to gain confidence in her planning for differentiated learning. In this pre-action dialogue, Rebecca attempts to

articulate an example of how to plan strategies for differentiating the learning within this particular class.

Mentee: Say for example... I could make up a worksheet that they could work through doing numbers and writing while the others are doing similar things but nothing like the same level. Do you see what I mean? Do that sort of thing?

Mentor: Well no I'd make them mixed ability groups because we can swap them and they can do both activities but it also will give a chance for the children, working at their desks, to pay more attention.

Mentee: That might actually work really well with what I was thinking to do. I found this really good book after a lot of searching, I was looking for about four hours yesterday. Anyway this book is about measurement so it's starting to get ready for next week. It's about the crocodile being measured for his clothes...

Although various websites advocate teaching strategies in organised formats (e.g., think-pair-share, Y charts, and KWL charts), many teaching strategies in this study focused heavily on understanding students' developmental stages and learning contexts. For example, teaching strategies for younger students (e.g., about 6 years of age) will vary compared to students in upper grades. The following pre-action dialogue illustrated how the mentor presented teaching strategies to her mentee regarding younger students' skill levels when commencing the writing of a literacy recount.

Mentor: They still don't have that skill to refer back to an individual bit of paper. You're getting them to remember by orally telling you what do they need and writing it up and seeing it visually, that's just another way to get it in their brains. But I mean they're still only six. So if you get them to sit and write everything they need to know for recount, that's one writing lesson instead of practicing. So by doing it orally, they're still coming up with the ideas.

Mentee: We're speeding it up.

Mentor: ...So because they can't write, they're too focused on the mechanics of that sentence that they have to write down.

Mentee: Yeah I'm with you, rather than on the –

Mentor: For us, our writing is automatic, that's why you've got to underline it. For them, it's not.

In other instances, the mentor and mentee showed that selecting certain strategies for differentiation may not be suitable for particular contexts. For instance, although group work is encouraged through the literature (Bibby, 2009; Hill & Hill, 1990; Johnson et al., 1993), Jenna explained to Rebecca that group work may not be successful for all students in particular lessons. Nevertheless, astute questioning can aid in the differentiation, as presented in the following post-action dialogue:

Mentor (Jenna): Your higher level kids were particularly engaged. They liked that a lot and they were... working well in pairs. The middle kids, they enjoyed it too but they were more independent. They didn't understand the working together, they wanted to work on their own, which was probably their level of development too. So maybe even when you write your teaching strategies, have a couple of higher-order questions you can ask those kids because they found it easy, they were just really enjoying it.

Mentee: I did notice at the end when I was asking questions that it was the higher-order thinking kids I've noticed, they were the ones that were keen on answering the questions about it and the others were, you know they sort of thought, oh we've lost their focus.

Mentor: So more when you're walking around when you're measuring, that's when you go to your higher-order kids and then you might pose [questions]. So you have to plan for that because once again you forget. Your brain is in a billion places at one time.

Mentee: Watching everything.

This post-action dialogue suggested planning strategies to introduce concepts (content knowledge) and associated vocabulary with a focus on questioning students at different levels and engaging them through hands-on activities. The mentor encouraged planning more differentiation in future lessons, particularly as pre-service teachers are learning about manage multiple people at different levels within one environment.

Implementing a lesson structure

Timing components of a lesson structure was a teaching strategy for implementation. That is, the mentee needed to consider the amount of time spent on any part of a lesson to capitalise on the key learning concepts. Jenna was clear that "the timing is tricky, that's always the hardest thing to work out" which elicited a response from Rebecca as a result of her in-action experiences, "Yeah it is hard and it's really hard just trying to state for me, because I concentrated so much on what I'm trying to do, with... everything going around". In timing components of the lesson (implementation), Jenna provided practical advice during the pre-action stage:

Because you don't want to spend too long because you want to actually practice your recount. So for them to write all of the things they need to remember themselves is going to take their whole half an hour for writing and they're not going to have the energy or the motor skills to write a recount.

It was apparent in this study that the mentee needed to learn the teaching strategy of timing within the lesson structure to promote student interest in learning, as Rebecca discussed with her mentor in the post-action stage: "I was trying to have more time after the book but by then I'd lost them. And that was my problem". Her recognition that the problem was in part due to her lesson structure (implementation) became a focal point for advancing her practices in future lessons.

Preparation and management of resources

As a pre-action stage, planning, including preparation and management of human resources, was noted as a teaching strategy to aid differentiation of learning within the classroom. Jenna stated that "If a teacher aide is here... she might help them. Often I make them start what we're doing at their own level". Indeed, it was highlighted that the teacher needs to plan and prepare for other human resources (e.g., teacher's aide, parents) within the classroom because "You can't waste them because you get them, by the time they're here and go, twenty minutes" (Mentor). In the mentor-mentee dialogues (pre-action and post-action stages), the mentor identified the preparation and management of human resources and aids to differentiate the learning. For example, "Carissa and Robin were doing computers to focus on a comprehension activity but sometimes it's just an independent activity so that you can focus with another group. It's not always a learning goal but when you've got one,

two, three, four adults in the room so you want, if you can, everyone to have a learning goal. Take advantage of it”.

The mentoring of differentiated learning was continuous over the four weeks of mentor-mentee dialogues with many very specific contexts. Indeed, the contextual circumstances were a repeated theme for deciding on an appropriate teaching strategy. In the pre-action stage, the selection of a strategy was discussed between the mentor and mentee in terms of how it met the learning needs of a student and groups of students. This appeared to be an effective mentoring strategy, as the mentee became clearer about how differentiation strategies worked, including the use of visual and auditory stimuli which also occurred in post-action dialogues. To illustrate:

Mentor (Jenna): The rhyme, using the book, they had their familiar rhyme was good because the low group... knew it. They can't read it but they can join in so they were probably more engaged than you think.

Mentee: Well I was thinking because I knew it would be one that would be easy for them and I know you've been working on fluency and I thought that singing, changing type rhyming, that's really good fluency so that's what I had in mind.

Mentor: So there were a couple of outcomes from that. Selection and assisted help with fluency, also focused the students well. We noticed that it really engaged the lower children who are often disengaged so that's good... So they'll tune in and at least pick up that oral language.

Similarly, preparing and using stimulus material with effective classroom management aimed to engage students as a class followed by strategising for the different learners, which aided the differentiation process. In both the pre- and post-action stages, teaching aids were emphasised frequently in the mentor-mentee dialogues along to differentiate the learning, as “it's giving them a visual prompt of what to write” (Jenna, mentor). When differentiating learning, this final-year pre-service teacher needed to determine the learning levels. In the following, Rebecca suggested to her mentor that conducting the activity with the higher ability group first would allow her to form ideas on how to alter the activity for the lower group, “So I thought I'd try that and I thought if I do it with the higher group first, that'll then give me some things that I can think okay how do I need to change this for the lower group, give me a go at it first”. The mentor assisted the mentee to gain clarity on selecting suitable teaching strategies for groups of students, which included direct instruction with the use of teaching aids (Stein et al., 1998).

Catering for groups of students

One session had both Jenna (mentor) and Rebecca in fluent pre-action dialogue lasting nearly half an hour, bouncing ideas off each other, and coming to agreement about an engaging literacy and numeracy integrated lesson. The conversation concluded with Jenna providing a final example of how she uses differentiation strategies: “sometimes I will set two or three groups in reading groups to do an activity like that because it's based on what we've been reading. Then [the teacher's aide] and I work with guided reading with the other two groups and the next day they'll go and do that activity”. About half way through the four-week practicum, both mentor and mentee outlined strategies that relied on made-up games and the use of visual cues such as tally charts: “adapt it for different ages I thought was a good one to do to have a practice at” before dividing the class “into their maths groups

and colours” (Rebecca). Jenna outlined the use of games to engage these students in learning for which Rebecca had planned a game and commented, “I thought it would be good for both the levels... make it a bit fun for them [and I] thought that would engage them”. There was the recognition that games as a teaching strategy supported the differentiation of learning experiences, as Rebecca said, “I did think the game helped, playing that game of grouping because then I kept saying how many groups, how many are we putting in these groups. So I connected, I did think that it helped”. These games were pre-planned and allowed the mentor opportunities to discuss how the games would work for differentiation.

Problem solving in action

In this study, it was shown that mentoring for differentiation required informing the mentee about observing student engagement and then drawing upon a repertoire of strategies to re-engage where necessary. Problem solving during the in-action stage (Schön, 1983) allowed the mentee to change strategies during a lesson as a better fit for addressing students’ learning needs. As pre-service teachers are in formative development, making adjustments in action can be challenging, particularly if they have not developed a range of alternative teaching strategies suited to different contexts. Problem solving in action considers the variations to routines and interruptions that can occur to a planned lesson. A challenging aspect of differentiation was catering for individual needs within a class of 27 students where students were absent, had completed tasks early or stayed on a task longer than expected. Rebecca commented that some students had two learning paths but did not have an opportunity to undertake both paths. The reality of the classroom is such that “...on days like that, it’s a matter of teaching to the majority. There are kids away today that received none, they got nothing of that. But most of your children were here the whole time” (Jenna). Rebecca indicated her frustration with an activity as a result of unforeseen problems in context: “It is really difficult because you try to keep track on who’s done what when and where they’re up to and why are they sitting there” (Rebecca). It was important that the mentee understood the reality of teaching and differentiated learning during the sharing of post-action viewpoints:

That’s all the part of it, that’s never in the lesson plan. That’s the real life part of it. And then someone has gone to the sick bay. Someone’s gone to the sick bay or someone’s gone to the office and they’ve missed it, that’s the real life part. (Jenna)

Yet Rebecca was coming to grips adjusting differentiation during the in-action stage. Negating on-the-spot challenges required her to re-think her understanding of how students work in the younger grades, such as realising that getting students to work independently in pairs and groups may not work effectively for all students at this age level. She acknowledged that some students required individual work at a dependency level, that is, one that necessitates further assistance from the teacher. Rebecca’s verbal post-action viewpoints indicated a need to change teaching strategies to suit contexts.

Mentoring content knowledge

Rebecca described the book she would use to stimulate student interest and differentiate the learning for writing a recount. She outlined to her mentor content knowledge and how in the book the crocodile character is being measured by lizards for which Jenna noted as a strategy for students to

understand the importance of measuring and recording measurements: “Oh this is good too because they’re recording it and that’s what we want to teach the children”. It was shown here that differentiation required decisions about content knowledge and age appropriateness. Both the mentor and mentee agreed that the content was age appropriate, as Rebecca noted, “I thought it would be good to do a recount because it’s very simple, he does this and then he does this”. The strategies used for differentiation incorporated literacy and numeracy learning (Gardner & Hatch, 2004), and Jenna, as a guiding mentor, extended the differentiation strategy by suggesting the use of hands-on materials such as cardboard cut-outs of creatures and toy models readily available in the classroom.

Debriefing during a post-action stage, Jenna emphasised to Rebecca the use of reading together and modelling reading to teach content knowledge about grammar at this grade level: “So you’re all reading together. So you’re modelling your fluency, you’re modelling expression. It’s not about the story as such it’s about the reading skills. So this one, we’d be talking about sentences, that’s a comma, there’s a full stop”. Jenna emphasised the strategies of simplifying the experience for students to understand the content knowledge, such as focusing on “tricky words ‘au’, this one has got ‘gh’. I might pick a book that has got a lot of ‘ing’ endings or a book that’s got some double ‘oo’s”. Jenna convinced Rebecca that the students are “all on different levels [so] you’re teaching them how to go about reading” when you model the reading. Rebecca responded, “So just like guided reading but for the whole group” for which Jenna replied, “Guided reading for the whole class and at a more simple level because you’re breaking it right down”. Sharing viewpoints during the post-action stage allowed Jenna and Rebecca to deconstruct strategies for differentiated learning, which included the modelling of content knowledge.

In summary, case study 2 showed the importance of the mentor’s role for articulating and modelling teaching strategies for differentiated learning during the pre-action, in-action, and post-action stage. In particular, it was highlighted over the four-week period that planning, devising group work with differentiated questioning techniques, timing within the lesson structure, preparation and management of human resources (e.g., teacher’s aide) and teaching aids (visual and auditory), and adjusting to suit varying contexts were strategies to assist differentiated learning. Importantly, the mentor’s articulation and modelling of strategies that differentiate learning and drawing from shared-practicum experiences with the mentee can provide clear examples of how this process works. Problem solving in action can translate into pliable solutions to suit student needs but requires the mentee to develop a repertoire of strategies applicable to a range of situations.

Drawing upon the findings from case studies 1 and 2, Figure 1 outlines the pre-action, in-action and post-action stages as a model of mentoring teaching strategies for differentiated learning. Sharing viewpoints in pre and post-action stages and providing feedback to the mentee during post-action stages was noted as an ongoing interaction within a mentoring partnership.

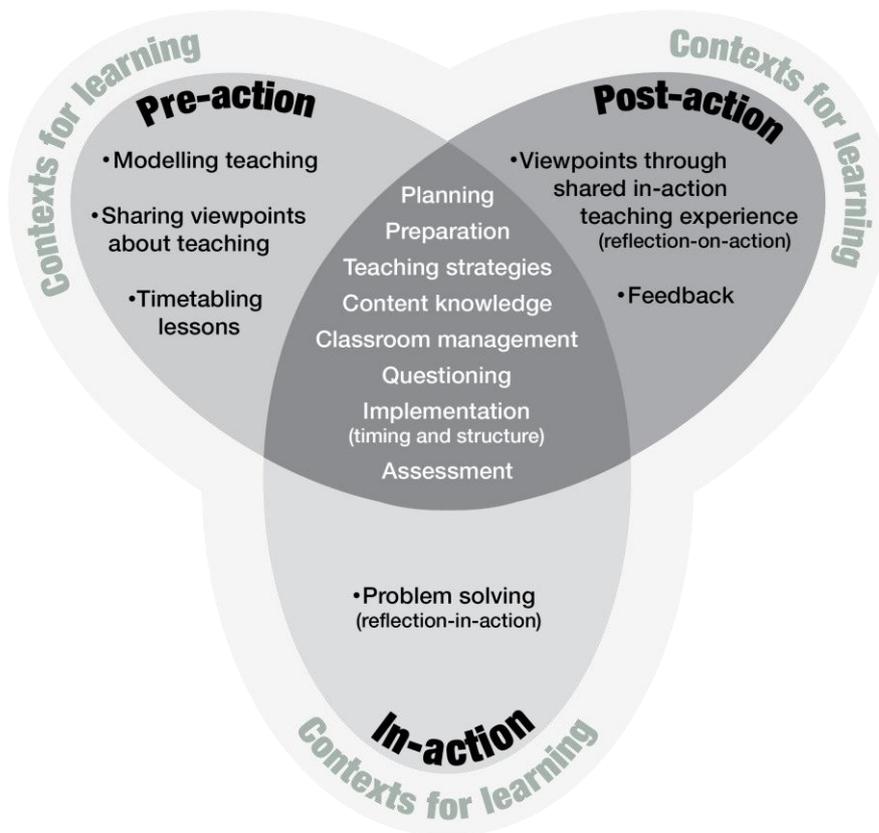


Figure 1. Model of mentoring teaching strategies for differentiated learning.

Conclusion

This research involved two case studies: an analysis of (1) 28 mentor teachers' accounts of mentoring and (2) mentor-mentee dialogues within a four-week professional school experience. Findings showed that contexts for learning surrounded the differentiation process for mentoring at the pre-action, in-action, and post-action stages. Figure 1 shows that central to each stage were pedagogical knowledge practices with problem solving (reflection-in-action that lead to creating solutions to problems) as crucial to in-action strategising in this study. Mentors and mentees' articulation of viewpoints at the pre- and post-action stages presented as ways to share teaching experiences for selecting teaching strategies for differentiated learning. This study demonstrated that mentoring for differentiated learning included the mentor's articulation and modelling of teaching strategies for specific classroom contexts (Figure 1). However, the study also showed that mentors need to be informed on the types of teaching strategies that can be employed for differentiated learning such as modelling the use of direct instruction (Stein et al., 1998) and student-centred strategies (Bibby, 2009). Nonetheless, Figure 1 as a model for mentoring pre-service teachers on how to devise teaching strategies for differentiated learning needs to be researched with a wider range of mentor teachers and pre-service teachers, including those at different stages of their development (e.g., first to final-year pre-service teachers) and with a range of different classes (e.g., Year 1 to Year 12), which would provide a more collective set of mentoring practices.

Involvement in a well-designed mentoring program may aid mentors' development on what and how to guide pre-service teachers. Discussions with mentees about planning and implementation (including timing within the lesson structure) and preparing for differentiated learning needs to include the identification of grouping students with situational experiences (rotational group work, hands-on experiences) and the use of contextually-suitable teaching aids (visual, auditory, games and resources) as differentiation tools. Theoretical frameworks such as Bloom's taxonomy (1956) and Gardner's multiple intelligences (Gardner & Hatch, 2004) can be used to guide mentors' articulation and modelling of teaching practices that differentiate student learning, including preparation and employment of resources and in-action problem solving to adjust for circumstances impacting upon a lesson.

Mentors can advance pre-service teachers' experiences by providing them with opportunities to plan, implement and reflect upon teaching strategies for differentiated learning, drawing upon shared-practicum experiences as examples of how differentiation works, and facilitating reflection-in-action strategies so the mentee can adjust teaching during implementation (Coffey & Gibbs, 2002). There is a continued need for research in these fields as "it is important to understand whether and how differences in what is provided for new teachers affects their work" (Kardos & Johnson, 2010, p. 41). Further research can explore each of the pedagogical knowledge areas indicated in Figure 1 and how mentors can help pre-service teachers to differentiate learning accordingly. For instance, how can mentoring on assessment as a pedagogical knowledge practice facilitate students' differentiated learning? How can mentors assist their mentees to devise, implement, record and analyse assessment for differentiated learning?

Universities have a responsibility to inform teachers on ways they can mentor pre-service teachers about the differentiation of learning; however, more research is needed to develop a repertoire of strategies for mentoring differentiation within schools. Indeed, pre-service teachers arrive with varied abilities, prior knowledge, and experiences that also warrant differentiation for which university staff and mentor teachers in partnership arrangements can assist their development. The model (Figure 1) presented in this paper can assist mentor teachers to consider how they mentor the selection of teaching strategies for differentiated learning with a focus on the pre-, in- and post-action stages to capitalise on the pre-service teacher's development.

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Associate Professor Peter Hudson (*PhD, MEd, BEd, DipTeach*) has a teaching career spanning 34 years (<http://staff.qut.edu.au/staff/hudsonpb>). He has over 100 publications in journals and conferences and supervises national and international doctoral students. Hudson's Mentoring for Effective Teaching (MET) model (<http://tedd.net.au/mentoring-for-effective-teaching/>) is at the forefront of his work in schools.