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Tailoring Mentoring for New Mathematics and Science Teachers: An Exploratory Study

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Abstract: This paper explores some aspects of effective professional mentoring practice for early career mathematics and science teachers, and discusses the Early Support Program (ESP), a research project conducted in 2009 and 2010 at a large Australian metropolitan university. It is argued that better outcomes may result from a more strategic “tailoring” of mentoring “type” for different aspects of new teacher induction, especially as school-based mentors often have insufficient time or training to support them. The ESP has been trialling its more “distanced” mentoring model, tracking the issues that a group of new teachers chose to discuss with their mentors, and exploring this further through focus groups and case studies. The project has indicated that more flexible, off-campus mentoring assistance may serve some needs particularly well, and that it may also alleviate the pressure placed upon teachers in schools. A secondary aim of the ESP research was to prepare an appropriate resource for teachers, based on its findings, and this has now been done.

Introduction

In Australia we are losing our newest teachers in alarming proportions, with a reported attrition rate between 25% and 33% within the first five years (Hartsuyker, 2007; DEST, 2003). This problem is even more serious in secondary mathematics and science classrooms, already hampered by the low number of graduate teachers in these disciplines (Oliver, McConney & Maor, 2009; Ormond & Sherriff, 2009; McKenzie et al., 2008; Riley, 2008; Rice, 2007; Watson, Steel et al., 2007; Yates, 2007; Croasman et al.; Guarino, et al., 2006).

Commentators have recently claimed that a higher retention of early career teachers in mathematics and science may be obtained by well-planned and executed professional induction and targeted mentoring (McConney & Maor, 2009; Friedrichsen, Chival & Teuscher, 2007; Rice, 2007; Yates, 2007; O'Brien & Goddard, 2006; Martinez, 2004; Smith and Ingersoll, 2004; Wong, 2004, DEST, 2002). Effective mentoring practice has indeed been known to reverse early induction deficits and to keep teachers far longer in the teaching profession (Hartsuyker, 2007; Martin, 2006; Moir, 2003). Of relevance to this paper also is recent research that highlights the gains in the use of virtual mentoring or e-mentoring (Simonsen, Leubeck, & Bice, 2009; Gareis & Nussbaum-Beach, 2007; Bierema & Hill, 2005; Goos, & Bennison, 2005; Kirk & Olinger, 2003; Schuck, 2003; Herrington, Herrington, & Omari (2000), or interactive chat sites and websites designed specifically to support new teachers, such as EdNA Online (2009), ENDAPT (2009), or BEST (Herrington et al., University of Wollongong, 2006).

In this paper I describe and reflect upon a two-year mentoring initiative for new secondary mathematics and science teachers – the Early Support Program (ESP) – and explore

the possible benefits and pitfalls of several mentoring models. The ESP, conducted at a large Australian metropolitan university in 2009 and 2010, and with funding from the state’s Department of Education, employed a form of “distanced” mentoring. Distanced mentoring is defined here as assistance relying mostly upon email and telephone contact; and in most cases, this was provided at mutually convenient times by a mentor teacher who was not teaching at the mentee’s school. Occasionally, school-based mentoring also occurred within ESP, but much less often than distanced mentoring. The ESP explored the procedures and effectiveness of this mentoring “at one remove”, and how these might differ from face-to-face, daily, on-campus mentoring.

Analysis of the data in both the 2009 and 2010 stages of the ESP project suggests that mentoring support of everyday personal and teaching skills is more successfully conducted by on-campus colleagues; while off-campus or distanced mentors were able to substantively assist new teachers with their reflections upon teaching content, teaching strategies, and overall planning for teaching. This paper reflects on some trends that have emerged in the two years of the study.

Conceptual Framework and Review of the Literature

The conceptual framework for this study is illustrated in Figure 1. In order to provide relevant context and perspective, the author explored the research literature concerning three important and interrelated aspects of the underlying issues. These aspects were seen to be the specific and earliest needs of new teachers, particularly those in the mathematics and science learning areas; the difficulties faced by school-based mentors trying to meet the demands of inducting new teachers; and the particular forms and qualities of off-campus, “distanced” mentoring that were likely to best support both new teachers. Each aspect will be discussed in some review of the literature: firstly, the research methodology of the project is described.

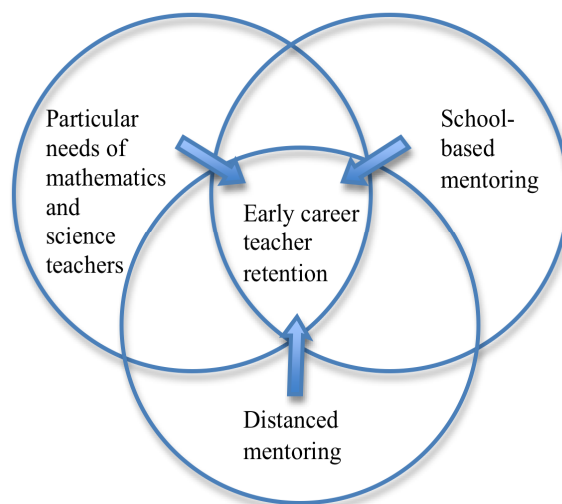


Figure 1: The ESP model for investigating best practice for mentoring early career maths and science teachers

Methods in the ESP Project

The researcher interrogated both written and oral feedback from eight mentors and 16 mentee teachers as they worked in mentee/mentor pairs over 2009 and 2010. The project attempted to respond to three key research questions:

- *To what extent has the ESP mentoring project increased the confidence and self-efficacy of the new teachers?*
- *What forms of professional mentoring support helped them to do this successfully?*
- *What were the characteristics of both effective and ineffective mentoring?*

The last of these questions comprises the major focus of this paper. More specifically to the following discussion, this third question could be re-cast as, “What issues were the mentors keenest to seek help with from their mentors in their first year of teaching?” and “Are some types of mentoring better suited to certain of these needs?”

Ten mentee teachers graduated from the University with a Graduate Certificate of Secondary Education at the end of 2008, and eight of these then completed a full year of mentoring in the ESP in 2009 (Stage 1). In 2010 (Stage 2), the mentors each worked with a new mentee, having completed their programs with the 2009 mentees (although several pairs are continuing to converse on a casual basis). The eight 2010 mentees either completed a Graduate Certificate of Secondary Education, or a Graduate Diploma of Secondary Education, in 2009. The eight mentors are expert secondary mathematics and science teachers, most of who are also Heads of Learning Area, with an average number of 27 years’ teaching experience. They were invited to be part of the program upon recommendations sought from their state professional bodies (mathematics and science education). In several instances mentors worked with two mentees over each year, but most worked with only one: and they were paid a small monthly stipend for their work with each mentee. The mentors were expected to spend up to an hour each week talking or writing to their mentees, between March and October in both years and in school term times only. On occasions some pairs met face-to-face, but, with one exception, they conversed away from the mentee teacher’s school workplace.

Data in both stages of the project was gathered both quantitatively and qualitatively. Monthly tally sheets (see Appendix 1) were collected each year from the mentors over seven months concerning the “type” of issues discussed on each occasion (see Figure 2). Similar tally sheets were collected from the mentees, for corroboration and validation. More detailed respondent perceptions concerning the program experience were also sought from both mentors and mentees. The mentors responded as a group and as individuals during a training workshop in March 2009, in three focus group teleconferences in April and September 2009, and March 2010, and in a reflective workshop in October 2009. Other written responses were in the form of workshop group work summaries, two individual questionnaires, two reflective journal entries, and the tallies. As the mentors received a small stipend for their work in the project, more specific input was sought from them than from the mentee teachers, and this was mainly evident in the mentors’ involvement in three intensive 90-minute focus group teleconferences. Each teleconference derived logically from the audio-taped conversations (and their analysis) of the one before it, and also concentrated more closely and specifically on the nature and frequency of the issues that the new teachers chose to raise with them. It was felt that it was important not to over-burden the mentees in their first year of teaching with too much data collection, and so focus group work did not involve the mentees, who instead used their “reflective journal” documents to offer commentary. Indeed, the mentee group did not respond as a combined group, but provided data through the tallies as described, two reflective responses, and two questionnaires in March and October in each year.

Yin (1994) has argued that any generalisations from case study results should be made in relation specifically to the central research theories, and should not concern inference about overall populations. This was certainly the intention in the ESP project. Six mentees and their respective mentors were each also involved in more detailed individual case study interviews in both 2009 and 2010. These case studies were intended to be *exploratory* (Tallis, 1997), in that data was collected prior to the final delineation of some exploratory research questions, and the studies were “considered as a prelude to some social research... with the framework of the study ... created ahead of time.” As Tallis explains,

Case study research is not sampling research, which is a fact asserted by all the major researchers in the field, including Yin, Stake, Feagin and others. However, selecting cases must be done so as to maximize what can be learned, in the period of time available for the study. (p. 2, 1997)

The case study questions looked more closely at some of the trends that emerged from the data. Focus group themes raised by the mentors themselves and frequency patterns in the tallies of issues discussed by the new teachers were carefully analysed before case study questions were prepared, as a triangulation check for valid analysis. Six case study pairs were interviewed in 2009 and 2010. Particular case study respondents were also chosen from the sixteen pairs because of the differences in the way they had chosen to arrange their methods of contact. For instance, one case study pair met regularly in person, four pairs used only email and phone calls, and one pair were the only mentee-mentor pair to work at the same school.

Reviewing the Literature

The Specific Needs of Early Career Mathematics and Science Teachers

The consequences of not mentoring inexperienced teachers in their first years of teaching are well documented. Some researchers have gone so far as to claim that in some schools there is a culture of indifference to the special needs of new teachers, which can create considerable distress and isolation (Moir, 2003; Martinez & MacKay, 2002). Kay Martinez speaks bluntly and says that “the impact on the beginning teachers ... of unsupported entry into inappropriate initial teaching contexts is deplorable and evident: they leave!” (2004, p. 104).

Yet effective school-based internship programs are difficult to sustain, not least because of the professional challenges that all teachers face, and the time constraints that these cause. Martinez rightly describes contemporary teaching as “difficult, complex, demanding, emotional work with teachers taking on many roles previously filled by other social agents such as family and church” (2004, p. 99). She explains that teachers step daily into contemporary classrooms that demand a “professional knowledge base” of “bodies of knowledge from sociology, discourse analysis, feminism, practitioner research, cultural studies and post-structuralism”, and that they must also cope with students from diverse backgrounds and the latest developments in the use of information technologies (p. 99).

This increasing complexity and accountability has serious implications both for more experienced teachers and for the successful initiation of new teachers – but when the added ingredient of complex learning area content is thrown into this mix, as is the case for teachers of secondary mathematics and science, the challenges are even greater. McConney and Maor, in their recent report concerning a mentoring program for science and mathematics teachers instituted by the University of Western Australia, stated that

... new teachers in the learning areas of science and mathematics may indeed need stronger support because these teachers often face greater challenges in keeping up with new knowledge, innovative pedagogies and new technologies, in addition to ensuring their early-career survival in the classroom. (2009, p.2)

Science teachers have specific challenges in the classroom laboratory, with lessons that require extensive preparation, the coordination of intricate physical tasks, and issues of student safety (Smith & Ingersoll, 2004, Luft & Patterson, 2002). Mathematics teachers require a constantly up-dated knowledge of the latest graphic or algebra-assisted (CAS) calculators, mandated for use in many Australian classrooms and tertiary entrance examinations. Indeed, it could also be argued that a competent teacher of mathematics must deal on a regular basis with three interrelated but distinct conceptual areas of mathematics, in the geometric, algebraic and probabilistic disciplines. Certainly, science teachers must do likewise in conveying to their students a general and coherent understanding of concepts in biology, chemistry, and physics. Simonsen, Leubeck, and Bice, in their 2009 analysis of 1404 electronic messages between 19 mathematics and science mentor-mentee pairs, found that *pedagogical content knowledge* (the subject of 520 discussions) was of nearly as much concern as was *pedagogical knowledge* (719 discussions). When one considers that the remaining 165 conversations exclusively concerned mathematical or scientific *content knowledge*, it is evident that assistance with mathematics and science content itself, together with how best to teach such content, was as important for these new teachers as was reflection on issues of classroom management and organisation.

Time and Place: the Difficulties of School-Based Mentoring

There is a specific set of skills and expertise required of a mentor for a beginning mathematics or science teacher, certainly. Yet mentoring in all learning areas has its demands. Many commentators have argued that the good intentions of even the more experienced and willing teachers in a school are not always enough: mentors need support and training as much as do their mentees (Hobson, Ashby, Malderez, & Tomlinson, 2008; Harrison, Dymoke & Pell, 2006; Martinez, 2004; Wong, 2004). Gardiner, after her study of school-based mentors, remarked that “mentoring pre-service teachers is a complex, contextualised, and dynamic process requiring a specialised body of knowledge” (2009, p. 56). She found in her research that one should not assume that all experienced teacher practitioners have “sufficient training, adequate tools, a comprehensive understanding of role expectations, [or] the prior experiences necessary to adequately address the multiple dimensions that their role as mentor entails” (p. 56). Gardiner also found that “cognitive coaching” in a reflective practitioner model was often not enough to assist mentors in dealing with the demands of working daily with their mentee teachers:

Mentors regularly encountered situations that they did not know how to negotiate, particularly at the interpersonal level. They consistently described how their mentoring responsibilities went beyond their expectations of providing pedagogical instruction, support, and feedback on teaching. They also found that their role included managing adults in terms of timeliness, professionalism, and preparedness, and dealing with sensitive, sometimes interpersonal, issues. (p. 62)

Moir (2003) also asserts that teachers are often simply not ready for the task of mentoring a new teacher:

Mentoring programs are too often conceived as “buddy systems” in which experienced educators are paired with new teachers on an informal basis. In these settings, mentors are typically neither trained for their new role nor given time to carry out its demands. (p. 6)

Hobson et al. (2009), citing their own study (Hobson et al., 2006), state:

Some of the mentors of first year teachers in our own research reported that they had not been trained for the role (Hobson et al., 2006), and it is possible that those teacher-mentors who are most in need of training and preparation may be the least likely to attend available courses. (p. 214)

Some current literature insists that a “partnership model” is the most effective of all types of mentoring. Bierema et al. (2005) and Hansman (2002) each stress the need for mentoring to be a two-way process in which mentor and mentee learn from each other. Hargreaves et al. (2003) emphasise that “the old model of mentoring, where experts who are certain about their craft can pass on its principles to eager novices, no longer applies.” Yet such a mutual and non-judgemental “partnership” is often difficult to achieve in the everyday complexities of a busy school. Successful mentee support and specialised mentor training require adequate time, and this is hard won in a highly structured school day. On-campus mentoring may also have some distinct disadvantages for the mentees – for example, if issues of campus-based hierarchical power come into the mentoring dynamic. Some support requires an immediate physical presence or even intervention by the mentor, especially if the mentee is experiencing classroom management issues, and such encounters may necessarily also involve some interference with the mentee teacher’s professional authority or autonomy. There must, understandably, be some degree of tension in being helped by the person for whom one “works”.

In any successful mentoring model, the needs of mentee and mentor alike must be carefully considered. Yet what constitutes truly effective mentoring practice for early career teachers – one that successfully addresses all of their various needs? Are some kinds of mentoring more suited to particular scenarios, or assigned times? The ESP study considered the notion that, with a view to optimising this effectiveness, the types of mentoring needed in particular situations might perhaps be more appropriately allocated to a “division of labour” between on-campus and off-campus support. It is reasonable to assume that mentoring practice and process may vary greatly according to the particular situation or issue of concern. Furthermore, exploration of the ESP data showed that there may be another factor to consider when assigning mentoring assistance: new teachers tended to have particular, quite specific needs at specific times in their first teaching year. This will be discussed again later.

Mentoring at a “Distance”

There has been considerable attention paid in the research literature to the usefulness and manageability of “virtual” mentoring, particularly in relation to the idea of the “partnership model” as opposed to a more authoritative mentoring style (Simonsen et al., 2009; Bierema et al., 2005). Virtual mentoring is one form of distanced mentoring and may occur more formally via a discussion and information website, or more simply through personal one-to-one email and phone contact. Martinez stated:

Web-based information now affords great flexibility with information provision, allowing mentees to take a far more active role in seeking information when they are ready for it. A wealth of teaching resources such as unit plans and assessment task sheets are readily available for new teachers, who are also likely to be more comfortable and more skilled in accessing these resources than the more experienced teachers who have traditionally been mentors. In addition, communication by email and chat board can offer new teachers intra- and inter-school networking support to counteract the isolation that many new teachers experience... Flexibility of access is clearly a distinct advantage of electronic information for busy practitioners who work tight schedules ... These resources may be of particular benefit for those working in rural and remote locations, for new mentors, and for sites with only one beginning teacher. (2004, pp. 101-102)

As early as 2000, Bransford, Brown and Cocking suggested that “opportunities for continued contact and support” for new teachers could be very appropriately met by sensible use of email and the Internet. This kind of support is currently provided in more formal interactive formats by such websites as, in the USA, the Electronic Networking to Develop Accomplished Professional Teachers (ENDAPT, 2009) and the Novice Teacher Support

Project, and, in Canada, the Survive and Thrive Virtual Conference for Beginning Teachers and the Northwest Territories Teacher Induction Authority (NWTIA, 2006) site. In Australia, the University of Wollongong's recent Beginning and Establishing Successful Teachers (BEST) had similar aims (Herrington et al., 2006), and the Australian College of Educator's EdNA Online site is fashioned on a similar notion. Herrington et al. emphasise the importance of "authentic contexts" for mentoring by using the online advice and support of experienced teachers. In Western Australia, the Graduate Teachers' Professional Learning Institute website offers induction assistance for all government-employed first-year teachers (Department of Education WA, 2010), as do many other Australian states.

Virtual mentoring through more personal mentor-mentee communication – via email, and sometimes by telephone – may also play a helpful role (Simonsen et al., 2009; Bierema et al., 2005; Kirk & Olinger, 2003; Dewert, Babinski & Jones, 2003). Upon the completion of their study of 19 mentee-mentor electronically paired sets of science and maths teachers, Simonsen et al. claimed that "private paired discussion facilitates a strong bond that links mentees, their mentors, and the classrooms in which they teach" (2009, p. 65). DeWert et al. similarly describe the effectiveness of their 2003 program of personal online support for beginning teachers, citing the particular benefits of "increased emotional support, decreased feelings of isolation, increased confidence as teachers, more enthusiasm for work, increased reflection, ability to adopt a more critical perspective, and improved problem-solving skills" (2003). Bierema et al. also point out that "virtual mentoring [is] an alternative to traditional mentoring that is easier to manage, less costly, unconstrained by geography or time, faster, and more egalitarian than traditional mentoring." They elaborate thus:

Virtual mentoring is not place-dependent ... Virtual mentoring relationships can be struck up and nurtured using many technical mediums, including email, electronic mailing lists, chat groups, intranets, and computer conferencing. In addition to a choice of tools, another potential affordance of virtual mentoring is time independence... E-mentoring is qualitatively different from traditional mentoring in that it can be asynchronous and proximity between the mentor and protégé is not an issue. (2005, p. 559)

The ESP was predicated upon a similar notion: that "distanced" email or telephone mentoring, away from the school campus, might provide both a practical and an interpersonal alternative that did not suffer from the time pressures of school-based mentoring. The project also explored whether distanced mentoring might cater for some needs better or more appropriately than others.

Tailoring Mentoring to the Context: Early Patterns Emerging in the ESP Priorities in the Mentoring Discussions

New mathematics and science teachers need collegial support, and they also have very practical professional needs. Effective strategies for holding student interest on a day-to-day basis are a consistent priority. In describing their interactive BEST website Herrington et al. stress practicality, and claim that "authentic context is instantiated in the investigation and support of real problems and issues of immediate concern to real teachers in Australian schools" (2006, p. 125). A recent UWA research study of new mathematics and science teachers reported that over 95% of the mentee teachers cited assistance with "content-related instructional and assessment methods" as by far their highest concern (Oliver et al., 2009, p. 8).

This corresponds with trends that appeared in the ESP project. It is also interesting that the Stage 1 mentee teachers were able to predict intelligently, and very consistently, just what they might need help with in the early months of teaching. As students in 2008, and again as

teachers in early 2009, the mentees were asked to anticipate their major needs in their first year of teaching. On both occasions they ranked highly and equally their desire for help with

- effective teaching approaches and strategies,
- finding suitable resources, and
- making the teaching content relevant and interesting to their students.

Both stages of the study have also shown that, for these new teachers at least, there were discernible patterns or emphases in the timing of their questions. Figure 2 illustrates the mentees’ priorities of need in their first-year teaching experiences, over two periods of 2009 and 2010, April-to-June, and July-to-October. The analysis seen here is based on the recording of “types” of issues discussed by the mentee-mentor pairs, tallied each month of both years (see Appendix 1). As might be expected, there was a considerably lower demand for assistance in the second half of each year, compared with the first half, and this is clearly seen in Figure 2. Supposedly, in the later part of their first year the mentees felt less need for mentor support generally, and, having become part of their school communities, relied more on assistance from their school teaching colleagues.

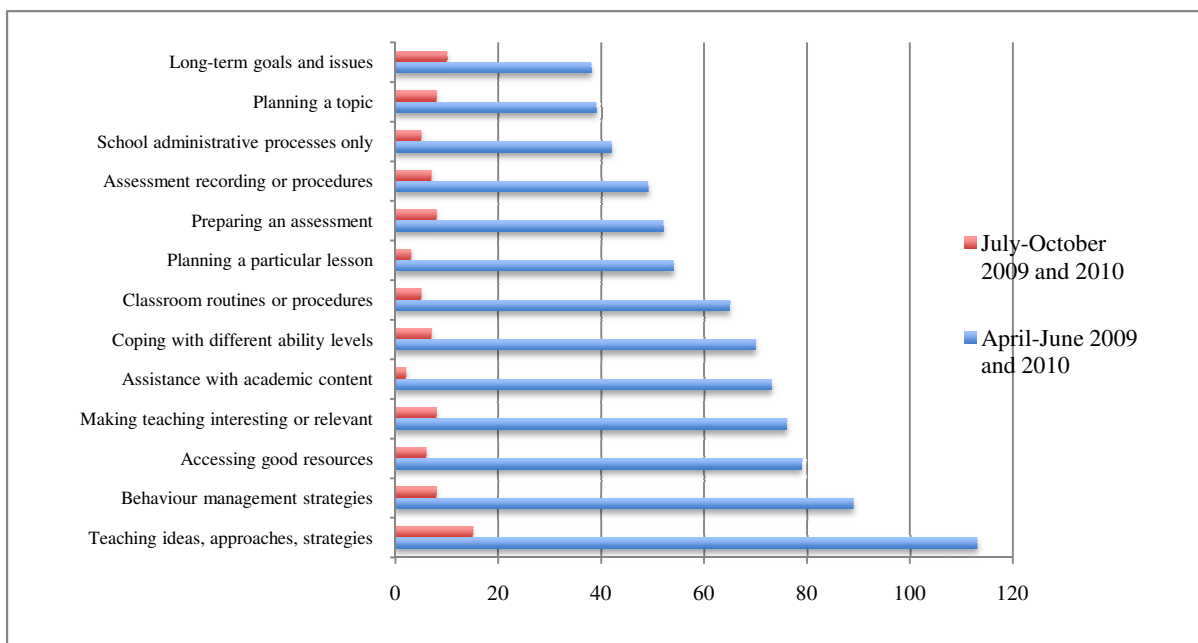


Figure 2. Frequency of mentee-mentor conversational issues, in the Term 1/2 and Term 3/4 periods of 2009 and 2010

However, the ESP analysis also shows that the mentees still called relatively often on their off-campus mentors. To gain a clearer picture, it may be more helpful to look at the proportions of “conversation type” overall. Figure 3, using the same data as Figure 2, displays again for each period of time the *relative* frequency with which issues were raised by the mentees. This therefore has the advantage of also demonstrating the relative importance to mentees of different issues over the year, even if they felt less need to have such conversations as frequently. “Teaching ideas, approaches, and strategies” were discussed in 13% of the all conversations taking place in the first two terms of both 2009 and 2010, and in 16% of these, in the second two terms of each year. As was the case in 2009, “behaviour management strategies” were discussed slightly less often from July through to October 2010, than they were from April to June.

The early career mathematics and science teachers in both stages of the *ESP* study experienced a consistent need for assistance with classroom content and teaching ideas for engaging students of different ability levels. Writing and administering assessments also remained a regular conversational issue. Meanwhile, more campus-specific administrative duties, classroom routines and procedures, were talked of proportionally less often as the year progressed, as was behaviour management. In both 2009 and 2010, the latter half of the year was more likely to see reflections upon issues such as what it meant to be a teacher, or long-term teaching goals and plans.

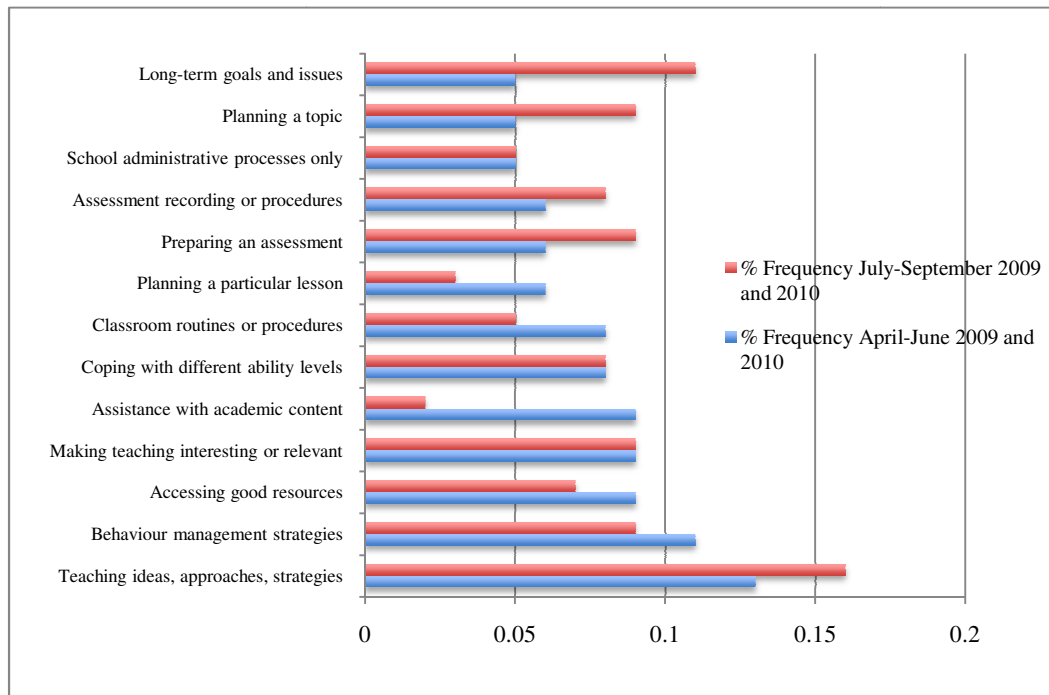


Figure 3. Relative percentage frequency of mentee-mentor conversational issues, in the Term 1/2 and Term 3/4 periods of 2009 and 2010.

Further, the trends seen in 2009 were again repeated in 2010. The mentors themselves commented upon this in teleconference conversations, reflective reports, and case study discussions: they noted the shift in emphasis in the mentoring conversations from early “survival” details to a broader or more comprehensive view of their teaching work.

Case studies in both years further interrogated these earlier observations. Twelve individual case studies were conducted for six mentee-mentor pairs, who were selected because of the slightly different circumstances with which the mentoring had evolved. As explained in the Methods section, the researcher felt these differences in some of the pairs to be constructive, ultimately, as it provided some natural experimental contrasts that also linked well with her research inquiries. The case studies looked more closely at the initial perceptions and problems of the new teachers, both as experienced by the mentees and as predicted by their mentors. The questions in the case study work was also again closely linked to the current supporting literature.

The Problem of Isolation

In their UWA study, McConney et al. highlighted their “considerable concern around the professional or workplace isolation of [their science and mathematics mentee] teachers” (2009), and Oliver et al. later reported that the mentors in this project worried about mentees’ problems with loneliness, a lack of initiation into the particular “culture” of the school, and an over-burdening of “difficult” classes (2009). The issue of professional and personal isolation was also raised in ESP teleconference and case study discussions. One mentee, somewhat older than the others and originally trained as a primary teacher, emphasised the following in his case study interview:

The ESP ... was an orientation into the profession and it was also a great source of support throughout the process, because all too often there is no one as a sounding board, there is no one to advise you or give you some feedback where relationships are concerned. That’s one of the primary reasons why there is a high dropout rate of teachers at the younger level, because they do not know who to turn to. If you have someone experienced it is just invaluable. (CS mentee 1, 2009)

Isolation and its contribution to early teacher attrition was a common theme in mentor focus group discussions:

When you go to a new school as a new teacher it’s not all about your subject area. It’s about all those unwritten rules, the culture of the school. That on top of new teaching can make the first month or so a very difficult month for the new teacher. (Teleconference 3, Mentor 7)

One mentor commented more specifically on the notion of a school “culture”, going so far as to claim that new teachers may be more susceptible to professional isolation in more established schools with fewer behaviour problems:

I had a culture shock myself when I went to my relatively leafy green school, having come from very difficult outer ring schools. The difference is in how the staff relate, and how they support each other. An overwhelming trend that I often talk about is, “The tougher the school, the closer the staff appears.” There tends to be more independence and doing your own thing in a school that is not as difficult. If we were down at [*names a more difficult school*] where the kids would eat you up alive if you put a foot wrong, ... the staff work together and are very close and are chummy, supportive with how they handle their lunchtimes and recesses and things. Then to go to a school like [*names a less difficult school*] where any discipline problems make days to remember, the staff tends to be a lot more fragmented. (Teleconference 3, Mentor 4)

Several of the mentors also talked about the important supervisory role played here by the Head of Learning Area (HoLA):

... I’ve seen HoLAs who haven’t been involved enough and the new graduate has been left to themselves; when they haven’t been given essential information and support because they are new to the school. A mentor is there for emotional support and classroom support and a HoLA is there too for some of it, but can take a little bit of a step back, I think, and be there really to monitor what is going on. (CS Mentor 2, 2009)

The mentors’ concerns were based upon their own past experiences and observations in schools, both as standard classroom teachers and later as HoLAs themselves; and there was a general consensus among them that the senior management in secondary learning area departments needed to ensure such basic provisions for new teachers in their first year as “teachable” classes (or at least one or two such), daily and consistent on-campus mentoring concerning the practical skills of teaching, and a collegial “buddy” to provide initiation into, as McConney et al. phrased it, “the school policies, whether written or unwritten”. Furthermore, all of the ESP mentors agreed that to meet adequately the various demands of effective teacher induction was a demanding task, and one that could not always be easily handled by the HoLA and his or her learning area team alone.

Mentoring in Behaviour Management Skills

The ESP project made several other interesting observations. The 2009 and 2010 frequency tallies showed that, while the issues of behaviour management and general classroom routines remained important to the mentee teachers, their inclination to discuss these with their distanced mentors grew noticeably less throughout the year, as already discussed (Figs. 2 and 3). In their final questionnaires in October 2009, the Stage 1 mentee teachers also did not generally attribute any significant improvement in their classroom management skills to the particular mentoring assistance of their distanced mentors. This is illustrated in Figure 4.

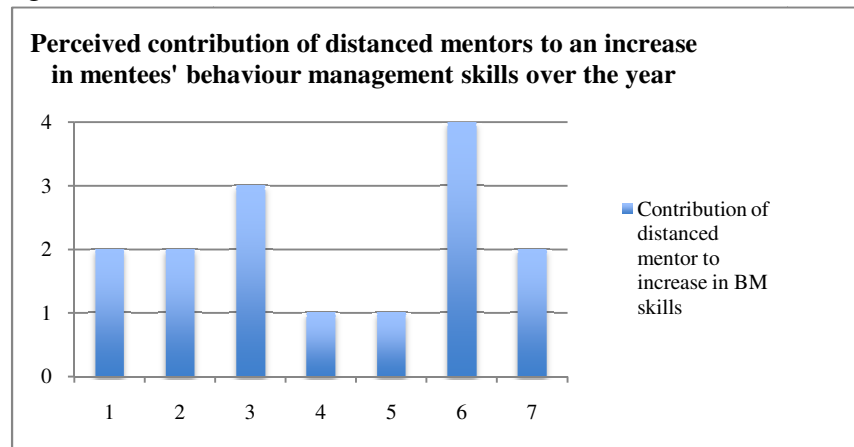


Figure 4: Bar chart showing scores for 7 mentees on a Likert scale (one missing): “How much have your behaviour management skills changed due to this year’s mentoring?” (Final mentee questionnaire, October 2009 (4: a large amount, 3: a reasonable amount, 2: some, 1: very little or none))

The researcher decided to explore this finding further. Tallis (1997) stated that “case studies tend to be selective, focusing on one or two issues that are fundamental to understanding the system being examined”, and a finer focus upon several emerging patterns seemed now justified, by way of ensuring good triangulation practice. One case study question was designed to assess the growing researcher perception that “mentoring at a distance” seemed to work more effectively for issues of teaching content and strategies than it did for behaviour management concerns.

All 12 mentees and mentors independently agreed with this, with several elaborating thus:

Teaching content and strategies are issues that can be defined, but they are not as dynamic as behaviour management, so therefore they lend themselves to distanced communication because they are a bit more tangible. They are more definitive, although there are various similarities about them to classroom behaviour management. [Behaviour management] also tends to be particular to individual situations, like each school has a different lot of students and different policies. (CS mentee 1, 2009)

I think with anything to do with behaviour management, being in a school [as a mentor] would be a benefit because you could go into the class and see what the problem is... To find what is causing behavioural problems in a classroom is difficult if you are mentoring from a distance because you don't know the students at that school. You can only relate it to the ones that you have. (CS mentor 1, 2009)

Being a distanced mentor we become a “distant advice giver” rather than someone who is also involved at that school level, but I would say that our mentoring probably worked best for teaching

content and strategies. The main area I gave assistance in was resources ... For behaviour management, I think it would be best for the mentor to be in the school... Distanced mentoring can sort of be one-sided, where the mentee is only giving their interpretation of what is going on in their classroom. (CS mentor 2, 2010)

I would agree, especially with behaviour management issues. A mentor would have to understand the clientele at the particular school to be able to give specific strategies dealing with behaviour issues. Whereas with teaching content and strategies you could quote a situation, you could have five or ten generic strategies that would apply to most teaching groups. (CS mentor 3, 2010)

Earlier focus group comments from several mentors foreshadowed this when they pointed out the drawbacks of not being physically present to observe their mentees teaching. In the second teleconference, one mentor remarked, “You can’t see what is happening in your mentor’s classroom”. Another said that, when discussing behaviour management, “You cannot pick up the non-verbal signals being given to you by your mentee. You must listen carefully to pick up the stress in their speech.”

Indeed, both quantitative and qualitative explorations in both stages of the ESP project confirm the notion that the development of the personal and teaching skills involving daily contact with students may better be overseen and supported by on-campus colleagues. On the other hand, upon considering the spread of issues recorded in the monthly reports, it seems that reflection upon teaching content, teaching strategies, and overall planning for teaching, appears to be well suited to a conversation at one remove from the school environment.

This said, the absolutely vital link between effective and interesting teaching and productive student behaviour in class is naturally acknowledged. Yet the question still remains as to whether a better “division of labour” can be implemented than is seen in the more traditional mentoring models that typically place great demands on busy teachers. The ESP mentors have recognised that there are different “types” of mentoring needed, and that one approach will not necessarily answer all of a mentee teacher’s needs. Intriguingly, one mentor, while convinced that her assistance was of substantial overall value to her mentee, recognised the limitations of her help and was even thankful for the “distance” that her particular brand of mentoring afforded *her*:

Distanced mentoring has advantages. I was able to give advice from a non-personal point of view. I know a few times when I have been a mentor in the school you get a bit frustrated sometimes because you would give advice and you could see that they weren’t taking it on... I could give advice to [my mentee] and she would go away and then come back to me as to how it went. I wouldn’t really know if she would apply my advice or not; she was content with the outcome. I felt happy if [my mentor] felt happy and supported. It didn’t really matter to me if she used my advice. I didn’t know her teaching habits and so I couldn’t really advise on little things like, using her voice, using pauses, and “Don’t start a lesson until you have all the students’ attention”. (CS mentor 2, 2009)

The Advantage of Reflective Time in Mentoring at a Distance

A second theme that emerged from interpretation of the ESP data concerns the mentees’ demonstrated need for more reflective discussions: they appreciated these “quieter” forms of communication, away from the school bustle. Bierema et al. claimed that “e-mentoring has the potential to foster a more deliberative, reflective, and thoughtful exchange”, and that “the asynchronous form of virtual mentoring enables more flexibility than face-to-face mentoring, although it lacks nonverbal communication and is lower in social presence” (2005, p. 559). Such autonomy and “breathing space” appears to have contributed to the success of the mentoring assistance in most of the ESP partnerships.

The ESP mentors commented in several focus group discussions upon the value of a reflective “time lapse”, where the new teachers often had to think through problems and issues for themselves before next contacting their mentors to discuss them. One mentor noticed that his mentee often “worked it out for herself” before she contacted him. He felt that their time could then be more usefully employed in evaluating and discussing her strategic choices, and that this encouraged her independence.

In a conversation with [my mentee] one night, she had a really bad day at school with her low ability classes and she was really anxious so I listened to her talking and we put up some ideas, you know. I put forward some ideas and I said, “You go away and think and choose what you want to do and implement.” I rang her back the next night because I was so concerned, because she sounded so worried - and she had implemented a couple of things she had chosen to do, and she had felt a lot happier and it was really good. She had calmed down a hundred percent. (Teleconference 1 (T1), Mentor 7)

Another mentor said simply that “the emotions of the mentee can be tempered before talking to the mentor” (Mentor 8, T2). Further testimony to the beneficial influence of some “wait-time” appeared in the case studies, in comments from both mentees and mentors:

When [using emails] I was actually framing my problem for [my mentor] and writing it down. It happened once or twice that I framed the question for her and then I said, “No, I know how to do it”, and then I didn’t actually send the email to her. Sometimes it’s good to just think back about what the problem is and you can find the solution yourself; you being in the class, you don’t find a solution at that point. (CS mentee 2, 2009)

The disadvantage for face-to-face [on-campus mentoring] is the [lack of] “think time”.... With distanced mentoring, by the time the contact was made the problem had sorted itself out or it wasn’t as big a problem as you first thought... Distanced mentoring gave the mentee “think time”, but also gave me “think time”, and I could also talk to other people before I gave my reply. I had the time to formulate a response, and then send an email back with possible options. (CS mentor 2, 2009)

There were advantages of *not* seeing [my mentor] every day at school. If I gave him a strategy, it gave him a chance to work with it over a number of days. He would be able to try slight variations of it over a couple of days to see what was working. In some cases, he had worked through a problem before he could tell me about it at our meeting. (CS mentor 1, 2010)

The third 2009 case study mentee-mentor pair was the only one working together daily in a school, and some interesting contrasts occurred in this on-campus scenario.

I think, at first, every little problem she would race to me to solve. I think a lot of times I basically solved the problem for her rather than her working out the problem herself. I found it a bit hard in a way, as it seems that she wanted me to be the problem solver (like advice on tap). (CS mentor 3)

We would meet every day, even more than once sometimes ... If I had a problem with something or wanted to discuss some ideas with her, or to get feedback, I would just go over to her desk and ask her. (CS mentee 3)

The Problem of the School-based Authority Relationship

Consideration of the more traditional mentoring relationship of this last-mentioned pair presented a third emerging theme, namely that of the nature of “power” in the mentee-mentor relationships. In this instance the mentor was also a HoLA, and the mentee’s line manager. Simonsen et al. note that “that one advantage of ... online mentoring is the safe haven it provides for discussing sensitive issues.”

Beginning teachers can interact with mentors who are far removed from the politics of their own school building or district. With the comfort provided by distance, they are free to talk safely about frustrations with administrators, colleagues, and parents, seeking the advice of experts or simply venting emotions with no fear of reprisal. (Simonsen et al., 2009, p. 66)

Whereas daily face-to-face contact with a mentor within the school environment can be highly effective as a source of support and can lead to real collegial rapport, it is also true that, as discussed earlier, a school-based mentor must necessarily be seen by the early career teacher as part of the hierarchical authority of the school. Distanced mentoring can provide for the mentee a welcome diversion both from the day-to-day and interpersonal relationships with students and colleagues, and from the school “culture”.

The following focus group comments from some ESP mentors emphasised this also:

Off-campus mentoring [is] less threatening and it is easier not to get personal so as to keep it professional. (T2, Mentor 7)

With off-campus mentoring there is no threat, no “power” over whether they keep their job, etcetera. [There is no] emotional aspect, of knowing the kids involved. (T2, Mentor 4)

My mentee has a chance to bring up any topic or problem area. I feel he likes the openness of being able to say anything about his teaching and performance management, and so on. The reassurance he receives from our meetings gives him a “good feeling”. (T2, Mentor 5)

The whole idea of mentoring is to be non-judgemental. You are there virtually to be a friend and to be of assistance without saying, “You need to pick up your game here”. This is effectively what a HoLA might have to do in some circumstances, if it comes to that. A HoLA has got responsibilities, but they are clearly a different thing to what we have as mentors. (T3, Mentor 5)

Stake (1995) highlighted the wisdom of selecting case study questions that maximise the researcher’s access to further knowledge about his or her theory, yet within a necessarily limited time frame. Thus, it was felt that these comments in the earlier focus group discussions again invited some further interrogation. Issues of “power” were teased out a little more in the case studies, as were perceptions of the role of the HoLA. All respondents saw a clear delineation between the “monitoring and management” responsibilities of the HoLA as a line manager, and the interpersonal support that could be offered by a mentor who was not in a position of authority in relation to the mentee:

There are politics within the school, and yes, there were some things that I could speak to [my mentor] about. Usually because of the nature of our relationship I was able to be quite frank with him, and he is a very professional person and when he responded he was always very neutral in a sense and not taking sides... The advice that he gave me was very helpful. I did speak to some colleagues at school who knew about [the situation] but they could have been biased, so he could give me a third party perspective and allow me to think outside the circle. (CS mentee 1, 2009)

My interpretation of a mentor is someone to help you, to build your confidence, to be there to support you, to say what you are doing is good and so on. I think being in the school is harder in some ways. I know it helps you with the behaviour management but to me there is a conflict of interest. If you were at the same school the mentee could feel that they couldn’t make comments about his HoLA or how the school is run. Not that [my mentee] was complaining about his at all, but it gave him an opportunity in confidence to tell me about something that is happening in the school. (CS mentor 1, 2009)

The HoLA is doing your performance management as well whereas a mentor doesn’t have to do anything of that sort; you are free to ask them anything. (CS mentee 2, 2010)

The benefits [of the distanced mentoring] were that she was in a tough school and she was struggling with the kids, mainly behaviourally; and most of the teachers were dealing with the same and so she probably thought if she spoke to other teachers about it that she was complaining about nothing. I think she was confident and comfortable that she could tell me; and I have worked in tough schools and I told her I understand, and these are the things that you need to do - and have a chat in that way. So that was a definite benefit, that I wasn't one of her peers or her line manager. (CS mentor 2, 2010)

[An] advantage of distanced mentoring is that it gives the mentee the opportunity to speak about real issues, as in relationships with other teachers. If your mentor in is the same school you really can't talk about other teachers. You don't want it to be personal but it is something that affects teachers ... yes, being able to vent those issues, especially those issues about working with your colleagues. (CS mentor 3, 2010)

A HoLA can best help a mentee by being part of the behaviour management system. They have a direct responsibility for behaviour management... There are lots of things a HoLA can do but I would not recommend the HoLA to also be the mentor, like I have been to [my mentee]. I think it is two different roles... I think any new teacher needs to use their HoLA for support, or ... maybe someone else on staff who is very experienced but because you are in the same institution you can support them on a day-by-day basis. It's different being with an [off-campus] mentee, because you need to reflect on things that may be asked of you. Being outside the school is preferential for a mentor. (CS mentor 3, 2010)

Tailoring Mentoring Roles: School-based and Distanced Mentors

Finally, the participants in the case studies commented in most instances on the value of *both* forms of mentoring: on-campus and face-to-face, or off-campus and distanced. The mentees were asked to reflect on the mentoring process that had worked for them more successfully, and both mentors and mentees commented on the overall mentoring “model” for new teachers that they would prefer to see in place:

I think a combination of both [kinds of mentoring], like in an ideal world, if that would be possible. Because there are two parts to it, especially for those teachers who have re-trained. There is the teaching bit that an on-campus mentor would be able to help out with really well; and there is the other part of the profession where you need to sense or debrief or look for alternatives because there might not be the variety at the actual school in terms of teaching strategies and procedures and things like that. So I think a mentor outside the school would help a lot with things like networking, and just to have a different view of how another department may be working in another school. So I think the combination of both would be a perfect situation. (CS mentor 3, 2009)

I would like the best of both worlds. The positives of having a person outside of the school give you the third party perspective. Having the HoLA in the school as your mentor is also very beneficial because you have that instant access and also they have 'real time' experience as to your teaching and things can be corrected before the very next day... Yes, it would become like that network of support that you can turn to. It's like having different suppliers for your materials. If one doesn't pan out then you can go to another one, and in actual fact, because the network is there, you can confirm or cross reference information as well. (CS mentee 1, 2010)

It appears that it is sensible to find a balance in teacher induction between “hands-on”, daily mentoring support, and the provision of disinterested, reflective and flexible guidance from an outside perspective. The ESP research so far supports the notion that *both* are important areas of support in successful teacher induction. It also appears that the first mode of support may be one best left to on-campus teachers who should perhaps concentrate chiefly on behaviour management and the practicalities of effective and well-organised maths classrooms and science laboratories – while the second, ideally offered by outside,

expert teachers at an electronic or physical distance, could more effectively focus on the qualities of good instructional practice, on the skills needed in delivering complex mathematics and science content, and on strategies to deliver this to students in a creative and engaging way.

Conclusion

The ESP exploratory study into best-practice mentoring of a small group of new teachers has offered some tentative but compelling findings. Distanced mentoring, with its potential for different approaches or emphases, may provide an additional form of professional support that is very effective for early career teachers, in most, if not all, areas of need. School-based teacher mentors often have real difficulty in finding “clear time” to assist their mentees. The delivery of truly effective and time-efficient mentoring of new teachers may require a more flexible and diversified approach, for maximum effect in the war against early attrition. One practical product of the ESP research was the preparation in 2010 of a handbook for secondary teachers, one that both provides important information for new teachers and evaluates and advises upon various mentoring models (Sherriff and Ormond, 2010). This resource is currently being placed upon the state’s Department of Education website, and will counsel mentors and mentees alike on ways to build and sustain effective and balanced support networks. Such network models will be based on evidence about what new teachers need, both *when* and *where*.

This paper is primarily concerned with the mentoring of beginning teachers of secondary mathematics and science, but many of the issues discussed pertain to effective mentoring practice for *any* new teacher. The evidence that has emerged both from observations in the ESP project and from the associated literature is in fact a fairly simple one: particular forms of mentoring do not suit all people, all of the time. The literature states that early career teachers have specific needs in the areas of curriculum content, course planning, instruction and assessment, reporting, behaviour management, and school policies and culture; but while face-to-face contact with an on-campus mentor has great potential benefits for the new teacher in many of these areas, effective school-based mentoring programs that address all of these issues are often difficult to sustain. On the other hand, private paired discussions from distanced mentors via email or telephone may also provide assistance to mentees and their mentors, and may do much to alleviate the time pressures inherent in daily school-based mentoring.

The often visceral challenges of classroom behaviour management need an immediacy of assistance that allows the novice teacher just to “survive” on a day-to-day basis, as much as to develop a repertoire of coping strategies. Through on-campus observation of effective techniques, and through daily staff room discussions with an on-campus mentor, the new teacher can gradually accrue the necessary behaviour management skills. On the other hand, busy senior teachers seldom have adequate time, when managing the daily demands and complex mechanisms of a school, to talk reflectively on such themes as long-term career objectives, or the pedagogy for student engagement, or the processes and forces that make schools “tick”. A clearer understanding in the school of the types of mentoring better suited to different scenarios, and a more sensible plan to divide appropriate tasks between on- and off-campus mentors, could increase the overall effectiveness of such professional support.

The Early Support Program (ESP) project examined these and other related issues. It has concluded that an addition to more traditional practices in school-based teacher

mentoring, a more distanced and reflective – perhaps also more relaxed – mentoring approach could prove to be another significant weapon against early career teacher attrition.

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**Appendix 1: Monthly Report (no. 3): Mentor
Early Support Program 2009
Mentor Reflective Report 3: June**

Please complete the following and return by **June 19th** as an emailed attachment to b.sherriff@ecu.edu.au.

NAME:	MENTEE:
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1. My mentee and I discussed ... (Please tick ALL relevant boxes for each occasion.)

Date of mentee/mentor contact	Phone or email ? (P/E)	Approx. time involved	Everyday teaching											"Bigger" issues					
			Teaching ideas, approaches, strategies	Assistance with academic content	Planning a topic	Planning a particular lesson	Preparing an assessment	Classroom routines or procedures	Behaviour management strategies	Assessment recording or procedures	Accessing good resources	School administrative processes only	Other *	Making teaching interesting or relevant	Coping with different ability levels	Long-term goals and issues	Other *		
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			

* Please specify below if you tick "Other".

Everyday teaching:

"Bigger" issues:

Do you have any other comments you wish to make?
