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**M Level primary mathematics CPD:
a culture clash or catalyst?**

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Abstract

One key outcome of a recent seminal review of primary mathematics was a renewed emphasis on the Continuing Professional Development (CPD) for teachers of primary mathematics (Williams, 2008). The National Centre for Excellence in the Teaching of Mathematics (NCETM) endorses its importance (Hoyle, 2012) and the current Government emphasises the importance of teacher quality (DfE, 2010). However, a prerequisite for the success of the drive to broaden participation in primary mathematics CPD is the willingness and commitment of individual teachers to enrol on relevant programmes.

This study explores the cultural barriers and incentives early career primary teachers experience regarding Masters-level primary mathematics CPD. Its focus is the teachers' analyses of their experiences within both their Initial Teacher Education (ITE) Higher Education Institution (HEI) and primary school setting. Data was collected through questionnaires and follow-up, in-depth individual interviews. Findings indicate that the role of significant others, such as the Senior Leadership Team, can be influential and that key aspects of the early career phase of a teacher's career can also be important. Implications for practice in both primary schools and HEI ITE providers are discussed.

Key words

Primary mathematics; continuing professional development; cultural barriers; cultural incentives; Masters-level

Introduction

This paper presents the findings of a small scale empirical study focussing on early career primary teachers (ECTs) and their engagement with Masters level (M-level) primary mathematics Continuing Professional Development (CPD). It investigates the influential cultural barriers and incentives within both their primary school workplace and Initial Teacher Education (ITE) Higher Education Institution (HEI).

The paper begins by setting out the context within which this research was carried out before offering a brief review of some of the relevant literature in the field, focussing on school and HEI cultures and the impact of primary mathematics M-level CPD. A description of the methodology employed follows before a description of findings, discussion and recommendations for how HEI providers of primary ITE and primary schools may effect a cultural shift in order to encourage more ECTs to engage with M-level primary mathematics CPD.

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This research is set in the national context of the last decade which has seen the development of a significant consensus that high quality mathematics CPD should be a matter of priority for primary teachers (ACME, 2002; Williams, 2008). Whilst a Newly qualified teacher's (NQT) induction year is often seen as a pertinent opportunity for a hiatus from further study (Stronach, 2010) with CPD centring on statutory induction (DfE, 2012a), the subsequent early years of a teacher's career are a prime period to enrich professional learning.

CPD is particularly crucial for ECTs as it can sustain a motivational sense of progression (Bubb and Earley, 2007; OFSTED, 2010) and develop critical skills necessary for expertise to develop (Lovett and Cameron, 2011). The Labour government's (1997-2010) support of this was exemplified by their targeting of ECTs in the drive to raise standards by developing a Masters-led profession (DCSF, 2008). To some extent, the current Coalition Government has sustained the acknowledgment that the standard of teachers is critical as they hold the belief that 'no education system can be better than the quality of its teachers' (DfE, 2010:8). However, political decisions affecting funding have meant the provision and parameters of M-level CPD for primary teachers, including mathematics-specific training, have been unstable.

Between 2009 and 2012 two strategic initiatives, the Masters in Teaching and Learning (MTL) and the MaST (Mathematics Specialist Teacher) programme were introduced on a fully funded basis only to suffer severe financial cuts leading to their demise (TDA, 2010, NCETM, 2011). The closure for new applications to the Postgraduate Professional Development (PPD) fund (TDA, 2011) also altered the landscape. In the face of such political adversity, the importance of cultural support to facilitate the engagement of ECTs with M-level primary mathematics CPD may be heightened.

For the teaching profession as a whole, augmenting the level of expertise of practising teachers could be considered a particularly current issue as more primary ITE is devolved to schools due to the increase in School Direct places (DfE, 2012b) and the broad remit of Teaching Schools includes a responsibility to support the professional development of colleagues across schools (DfE, 2010).

Literature Review

This review of literature focuses on relevant cultural aspects of both primary schools and Higher Education Institutions (HEIs) who provide primary ITE. It culminates in a consideration of the impact of M-level primary mathematics CPD.

Every school has its own individual, unique culture (Cole, 1999; Stoll, 1999; Jakhelln, 2011) which Roby (2011) suggests is primarily moulded by the Senior Leadership Team (SLT). Adamy and Heinecke (2005) believe it affects all teachers and Cole (1999) suggests that at one end of the spectrum, not observing conventions nor sharing values can 'present obstacles to the smooth flowing of professional development, causing anything from a ripple to a tidal wave' (1999:58). Jakhelln (2011) describes the contrasting situation whereby teachers identify the culture, assimilate within it and thrive.

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There is evidence to suggest that some schools have a culture which recognises the positive contribution of CPD and as such has a beneficial influence on teachers' professional learning (Bolam and Weindling, 2006; Arthur et al., 2006). This may manifest in a member of SLT who acts as an advocate (Hustler et al., 2003; Seaborne, 2010; OFSTED, 2010) and specifically, the Institute of Education (2012) determine SLT support to be essential if teachers are to meet the requirements of the Mathematics Specialist Teacher programme (MaST) advocated by Williams (2008).

Equally, there is strong evidence to suggest that school culture can act as a barrier to ECTs' participation as the impact of those schools with little or no culture of M-level study, often characterised by a lack of SLT support, can hinder teachers' professional development (Field, 2011; Lovett and Cameron, 2011; CUREE and the University of Wolverhampton, 2011). The rationale of such a culture can be attributed to a number of factors. Firstly, UK school culture is commonly acknowledged to be characterised by intense pressure, frequent stressful periods and heavy workloads (Travers and Cooper, 1996; Brember et al., 2002; Gold et al., 2009; Turnbull, 2007; Shernoff et al., 2011). Such characteristics may prevent ECTs from engaging with M-level primary mathematics CPD due to sheer incompatibility with the demands of M-level study. Secondly, a pervading conviction that M-level study has little or no impact on classroom practice can result in a culture which does not value, encourage or model M-level CPD (Leaton Gray, 2005; Wellcome Trust, 2006; Seaborne, 2010). Finally, it is suggested some schools do not cultivate a culture of M-level CPD as they are keen to maintain their status quo by not encouraging a questioning ethos which could evoke challenge and change (Arthur et al., 2006) nor by making less-qualified, more senior staff feel threatened (Hustler et al., 2003).

HEIs' culture regarding primary mathematics M-level CPD can be influential as typically there is often only a short time frame between studying on an ITE programme and subsequent employment as an ECT. There is little evidence to suggest that the culture encourages ECTs to engage with M-level CPD and the GTCE (2011) identifies a 'serious lack of continuity and coherence between ITE and early professional development' (2011:78). Furthermore, Jackson and Eady (2010) suggest that M-level study is 'by no means embedded as a positive perception in the minds of teacher educators' (2010:1). This can prove problematic as Snowman and Biehler (2006) suggest ITE lecturers' attitudes towards M-level CPD, as evidence of the wider culture, can be extremely powerful.

It seems important for an HEI's culture to sustain a proactive commitment to M-level CPD recruitment as evidence suggests that marketing and provision of accessible information sources, including those relevant to funding streams, is critical if participants are to enrol (Soulsby and Swain, 2003; Arthur et al., 2009; CUREE and the University of Wolverhampton, 2011). The importance of this for HEIs is highlighted by the sharpened focus on student recruitment effected by the momentous changes to funding streams from the beginning of the 2012/13 academic year (BIS, 2011).

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There has long been held a belief that high quality CPD is essential to maintain high standards of teaching (Burghes, 2008; OECD, 2009; Wiersma and Jurs, 2009). In general, Jackson and Eady (2010) believe 'the successful translation of the vision of an M-level teaching profession could promise a powerful and ultimately positive transformation of the education system in England' (2008:9). Specifically, Sammons et al. (2008) believe teaching quality to be a 'significant and moderate to strong indicator' (2008: iii) for mathematics progress of primary aged children. Whilst Ofsted (2012) suggests progress has been made in primary mathematics teaching, significant areas for development are also identified. As Director of the NCETM, Professor Hoyles' (2012) comment that that the NCETM looks forward to helping embed OFSTED's targets in the professional development of all mathematics teachers reinforces the importance of CPD.

Overall, a significant amount of research suggests that it is crucial for both school and HEI cultures to encourage and support M-level CPD if ECTs are to participate. However, to date the focus has primarily concerned non-subject-specific CPD and that the narrower area of primary mathematics M-level CPD remains relatively untouched.

Research Design and Initial Analysis

The research was carried out during the summer term of 2012, largely within the south east London area. The following research questions were addressed;

- What cultural incentives encourage ECTs to engage with M-level primary mathematics study?
- What cultural barriers prevent ECTs from engaging with M-level primary mathematics study?

This research was guided by a constructivist ontological position and an interpretivist epistemological stance. It involved ten participants who were working as class teachers in both private and state primary schools, within their second, third or fourth year of employment. The cohort comprised of PGCE and BA(QTS) graduates who all completed ITE in an HEI; three of the participants were engaged with MaST whilst seven had not yet begun any M-level CPD. The research was concerned with exploring their accounts of personal experiences (Scott and Morrison, 2006; Cohen et al, 2011). The small number of participants facilitated detailed exploration of the issues (Hennick et al., 2011) and the qualitative methodology aimed to achieve an in-depth understanding of the participants (Gage, 2007; Bryman, 2008; Cohen et al., 2011). The research tools were questionnaires and semi structured individual interviews.

Each of the ten participants completed a questionnaire which asked them to identify from a list, and subsequently rank, any influencing factors on their engagement with M-level primary mathematics CPD. Despite being a finite list of options, there was confidence that the options were sufficiently comprehensive as they were borne out of the existing literature. To further allay any risk of limiting answers to a pre-determined range, the inclusion of an 'other' option on the questionnaire enabled participants to add more information if necessary.

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Following completion of the questionnaire, careful scrutiny led to selection of the most appropriate interview schedule for each participant's individual interview. These lasted approximately thirty five minutes and due to the semi structured guidance, the interviewer was able to react sensitively to participants' answers and non-verbal communication. The dual approach of questionnaires and interviews is supported as it enables participants' answers to be followed up, clarified and extended (Kvale and Brinkmann, 2009).

The short interviews were recorded, transcribed and checked by participants for accuracy. Subsequent coding enabled 'key issues to be 'clustered' and initial steps taken towards drawing conclusions' (Bell, 2010:222). As a result of this process, the emergent themes regarding the cultural barriers were as follows;

- Lack of impact on teacher's role
- Prohibitive work/life balance
- Lack of support
- Lack of information
- Lack of role models
- Lack of consideration

Revealing some overlap, the following clusters emerged from the data regarding cultural incentives;

- Support
- Consideration
- Status

The research was carried out in alignment with The British Educational Research Association's (BERA) (2011) guidelines. The participants provided their informed consent, data was stored securely and pseudonyms have been used throughout to protect anonymity.

Findings and Discussion

Cultural Barriers

Much of the existing literature explicating the cultural lack of engagement with M-level primary mathematics CPD is supported by this research. Firstly, some ECTs revealed a belief that it does not have a positive impact on their classroom practice or leadership role. Kate explains;

'If I could see a real, real benefit or necessity in it, then yes, I probably would push myself to think, ok, it's going to pay off in the long run, being stressed out for a year or so. But at the moment I can't see the impact outweighing the stress of it.'

Instead, alternative opportunities for CPD are identified by Sally who rates working alongside experienced colleagues more highly than formal CPD engagement:

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'My Y6 partner is an amazing maths teacher – I don't know if I would learn more from her, watching her every day, doing it alongside her than going on a couple of courses and writing.....For me personally, doing it every day, experiencing it every day, observing it every day means more to me than going on courses.'

Secondly, key cultural phenomena of the teaching profession namely heavy workload, time pressures and working stresses, widely prominent as barriers within a range of existing research (Travers and Cooper, 2006, Brember et al., 2002, Soulsby and Swain, 2003, Gold et al., 2009, Turnbull, 2007 and Shernoff et al., 2011), were also strongly apparent within the interviews, as summarised by Hatty's comment;

'I don't think I've had a day off, including weekends, in about four weeks now. It's really crazy. At the moment, it's [M-level CPD] not physically possible. I am literally treading water and I think with anything else, that'd be it.'

In fact, two out of seven teachers named stress as their most significant barrier and Kate explained that;

'At the moment it's very busy and I would rather stick to the teaching to try and do it well than try and stretch myself and try and do something else and then be stressing about both.'

The embodiment of an unsupportive culture as lack of support from SLT was also evident;

'I mentioned to my Headteacher that I was really interested in doing an MA and she just said that I could go on a course instead. I don't know why she said that, but I said that I really wanted to do it' (Coral).

Kim, who achieved 40 M-level credits during her PGCE (just less than one quarter of a full MA), listed a range of reasons explaining why she had no intention of committing to further M-level study. Amongst them was the fact that as her PGCE programme drew to a close, there was little input from lecturers regarding returning to complete further study; this reflects existing research which highlights a lack of cohesion between ITE and EPD, specifically a lack of encouragement from ITE staff (Jackson and Eady, 2010, GTCE, 2011). Coral too found the level of encouragement and accessible information, symptomatic of the culture of the HEI, to be a barrier;

'I just think, 'how am I going to study?' None of the lecturers said anything to us when we graduated from our PGCE about going back to top it up to a full MA. I did have a look at the website but didn't really get very far with it' (Coral).

However, three new embodiments of a culture which does not value M-level CPD were apparent within interviews. Firstly, it became evident that difficulties faced by ECTs regarding the location of critical information were a preliminary

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stumbling block. Essentially, a barrier emerged as SLT members were not a source of useful information as could reasonably be expected;

'The other barrier really is a lack of knowledge on my part; I just need time to research it more and find out how I could get involved in it and how I could fund it' (Lily).

Secondly, Kim explained the lack of a critical mass of teachers engaged with M-level CPD meant the possibility was not even considered;

'I have no idea whether anyone here is doing an MA! It's never been like 'ooh, are you planning on doing an MA?' there is no kind of emphasis put on it at all.'

This contributed to a consensus by the non-participatory ECTs that a dearth of role models proved to be barrier;

'I think she's just been in the job for years which is why she got the maths co-ordinator post. And also, it sounds really lazy, but if you can become a maths co-ordinator without having to go on courses and write assignments then.....' (Sally).

Thirdly, the culture of HEIs seemed to have a negative impact on the uptake of M-level CPD as Ella felt it did not consider teachers' workloads fully enough which contributed to difficulties presented by timings;

'I found it difficult that all the deadlines were at the end of term. I understand that as it has to tie in with the academic year, but in some ways it would be very helpful if it could be reversed! It would be better if you could have your main body of work due in in September after the summer' (Ella).

However, Ella was the sole ECT who raised such a concern and it may be that the remaining participants had a greater acceptance or understanding of influencing factors for HE submissions due to their ITE or other HE study. Alternatively, it could be that at an earlier stage of the ECTs' thinking, the possibility of M-level mathematics CPD was dismissed rendering submission deadlines immaterial.

Cultural Incentives

Cultural incentives from school settings evident from the data also reinforced existing literature to some extent. The importance of support from the SLT (Hustler et al., 2003; Seaborne, 2010; OFSTED, 2010) was evident;

'The Head was very much 'I'd love to have a MaST within the school', as a selling point, as a way of trying to promote the school which is understandable. I definitely know that it's something the Head wants for the school which again gave me that boost' (Angus).

However, the interviews revealed how a wider cultural appreciation of M-level CPD was also advantageous. For example, Lee identified his school's Chair of Governors (who perhaps significantly was also the Head of Primary Education at

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XXX University) as playing a critical role and all three ECTs enrolled on MaST said their initial incentive was their Local Education Authority (LEA) mathematics advisory teacher's advice. In Angus's situation, the advisory teacher had arranged for several existing MaST students to present to potential new participants which he found inspiring; 'It's always good to hear someone else say 'yes, this is good and yes, the delivery is strong'.....I trust colleagues.'

Lee's experiences suggest the culture of his HEI promoted M-level CPD; he cited his ITE lecturers as being influential and also identified the online nature of his initial Master of Arts (MA), which facilitated flexible distance learning, as a great incentive and further proof that the HEI's culture accommodated students' needs. This was a fairly unique viewpoint within the group of participants as only two of the total number of PGCE graduate participants returned to their ITE provider for further M-level courses.

Ella felt that a generic school culture which provided support for NQTs in the form of the statutory release time could have been an incentive for her;

'Strangely enough, I think if I'd have done my MA in my first year of teaching I may well have got through as the extra release time I got as an NQT may have made it possible.'

This is not evident in the literature and raises the question of a fitting time frame for M-level CPD within a teacher's career.

Some ECTs felt incentivised by the sense of pride and achievement the culture of their school would afford them should they be awarded an MA;

'I think it would be something to be proud of. I'd quite like the accreditation and the status of it, that's what would make it stand out from other CPD that I've done' (Lily).

Again, this is not prominent in the existing literature and is in direct contrast to Hustler et al.'s (2003) research which suggests more experienced teachers may feel threatened by junior colleagues' professional learning, as opposed to considering it a cause for admiration.

Conclusion

To summarise, findings from this small scale research project shed some new light onto the cultural barriers affecting ECTs' enrolment on primary mathematics M-level CPD. One important finding was the implication of a lack of research-active school SLT members as role models. Concerning cultural incentives, the lure of feelings of accomplishment and pride upon completion and opportunities afforded by a reduced NQT teaching timetable are significant for participants of this study. Furthermore, the genesis of crucial support appeared to come from a far wider pool than has previously been suggested in the literature in this field.

Despite Bryman's (2008) caution that limits to generalization render the findings relevant to the sampled population only, tentative implications for practice can

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be suggested. Firstly, a shift in HEIs' culture in order to provide greater kudos and urgency to M-level primary mathematics CPD seems important. This could be embodied by a compelling input towards the end of an ITE programme regarding how to re-enrol on primary mathematics M-level modules, such as MaST. Furthermore, thoughtful consideration of practicalities such as achievable submission deadlines could also epitomise such a culture. Part of the rationale underpinning the reinvigorated HEI culture would need tutors to provide evidence and to stress that M-level primary mathematics CPD impacts positively on school standards as a powerful incentive is job applicability (Leaton Gray, 2005; The Wellcome Trust, 2006; Seaborne, 2010). To this end, HEIs need to improve the transparency and accessibility of the course content (Soulsby and Swain, 2003).

Fundamentally, such a shift in HEI culture could have a domino effect of improving schools' cultures regarding M-level primary mathematics CPD. A greater appreciation of its impact on school standards could potentially encourage the SLT to personally engage, thus providing positive role models for ECTs. Further, a more supportive whole school culture could encourage SLT members to both actively support ECTs' enrolment and use techniques such as coaching and mentoring to help them overcome cultural issues which are real barriers, such as workload and time pressures.

Further research focussing on a different group of participants could help generate a greater understanding of the influence cultural aspects exert over ECTs' participation in M-level primary mathematics CPD. Investigating school and HEI culture regarding M-level primary mathematics CPD, using the employees as participants could prove enlightening. Comparing their perspectives with that of the ECTs could potentially give an insight into further ways cultures could be moulded to encourage more ECTs to engage with M-level PM CPD.

Overall, this small scale research has highlighted some tangible, achievable ways in which two settings could support efforts to encourage the future of the teaching profession to enrol on M-level primary mathematics CPD, ultimately contributing towards the goal of raising standards of primary mathematics.

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