Evaluating the impact of teacher professional development: an evidence-based framework

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Does teacher professional development make a difference? How do we know? While researchers and policy-makers acknowledge that teacher professional development (PD) needs to be assessed and evaluated, there is often little clarity as to how this can be achieved. Evaluation of teacher PD by schools has been described as the weak link in the PD chain despite it being linked with improved PD experiences and pupil outcomes. A lack of skills and tools to carry out such evaluations may be contributing to this or indeed it may be linked to how PD is conceptualized. This article explores extant literature and models of evaluation revealing gaps in existing evaluation frameworks. Resulting from this a provisional PD evaluation framework was developed for use in a study that set out to formally evaluate the impact of a PD initiative on teachers’ professional learning in five urban primary disadvantaged schools in the Republic of Ireland. Following application within this study, the framework was critiqued and revised. This resulted in a new PD Impact Evaluation Framework that may support teachers, schools, departments and policy-makers to carry out systematic and focused evaluations of teacher PD.

Keywords: impact; evaluation; framework; professional development; change

Introduction

The demands of a globalized economy, and the perceived need to perform well in international measures of educational effectiveness (such as Programme for International Student Assessment [PISA]), ensure that despite global recession many governments continue to invest in teachers’ professional development (PD) as a means of enhancing pupil outcomes. This is certainly the case in the Republic of Ireland (ROI), where this research was conducted and where PD is receiving significant investment despite major cuts in public spending generally, and education in particular. In July 2011, the Department of Education and Skills (DES) launched the ‘National Strategy to Improve Literacy and Numeracy among Children and Young People 2011–2020’. Within this Strategy there is a significant commitment to teacher PD aimed at improving educational standards. The need to assess and evaluate the impact of this PD is also reflected within the Strategy. Also evident in the strategy is a new requirement for all teachers to engage in dedicated PD in the context of literacy and/or numeracy over a five-year period. The clear expectation

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within the strategy is that effective initial planning will increase the potential impact of this PD on pupil outcomes (Guskey 2000, Earley and Porritt 2010), thus highlighting the importance of teachers and schools knowing how to carry out such evaluations.

Traditionally, measuring the impact of teacher PD has focused largely on teacher satisfaction and ignored impact on teacher learning, use of new practices, pupils’ outcomes and/or value for money (Rhodes et al. 2004, O’Sullivan 2011). However, given this ongoing investment, in current straitened times, and an international trend towards accountability, there is an increasing emphasis and need to evaluate the impact of teacher PD. While researchers, policy-makers and schools in some jurisdictions continue to struggle to establish whether PD makes a difference (Rhodes et al. 2004, Centre for the Use of Research and Evidence in Education [CUREE] 2008), there is an increasing number of causal impact studies carried out in the United States and elsewhere that demonstrate the important link between teacher PD and pupil outcomes (Yoon et al. 2008). These studies that have used randomized controlled trials or some form of quasi-experimental designs have contributed significantly to the research base on PD impact with the aim of informing policy and guiding future investments in teacher PD. While these studies have a very important role to play in research on PD, researchers themselves acknowledge issues around generalizability of results across a variety of typical settings (Wayne et al. 2008). Arguably it may be:

best to initially study the impact of a PD intervention on teacher knowledge only … [because] to have an impact on student achievement of a detectable magnitude, the impact on teacher knowledge must be quite substantial. (Wayne et al. 2008, p. 476)

While there is a clear value in being able to link pupil outcomes with PD by using rigorous causal impact studies, it is also important to understand the complexity of teacher learning and teacher change to know how to support the link between teacher engagement with PD and pupil outcomes (Wayne et al. 2008, Opfer and Pedder 2011). This paper is situated within this latter approach of evaluating the impact of teacher PD as it seeks to explore teachers’ perceptions of a PD experience and its impact on their learning and change.

However, evaluating the impact of teacher PD is inherently problematic (Rhodes et al. 2004, CUREE 2008), especially for schools. This is reflected in Ofsted’s (2006) findings, where they report evaluation of PD within schools as the weakest link in the PD chain. Earley and Porritt (2010) argue that the difficulty for schools may lie with a lack of appropriate expertise and inadequate tools to carry out such evaluations. This paper begins to address this need through presenting an evidence-based framework, which sought to formally evaluate the impact of a PD initiative on teachers’ professional learning. Within this study, teachers’ professional learning is defined as the growth of teacher expertise leading to a change in practice that results in improved pupil learning (New South Wales Institute of Teachers 2007).

The aims of this paper are fourfold: first, to explore the challenges associated with evaluating PD; second, to analyse previous evaluation models that explore impact on teachers’ professional learning; third, to demonstrate how a Provisional Framework was devised for use in this study; and fourth, to set out how this framework was adapted following implementation to result in the evidence-based PD Impact Evaluation Framework presented here. Therefore the focus of this paper is
on the design and development of an evaluation framework that was used to assess the impact of a PD initiative within the context of the following study.

**Context**

The study was carried out in five urban disadvantaged primary schools in the ROI as categorized by the Social Inclusion Section of the DES using the DEIS (Delivering Equality of Opportunity in Schools) Banding categorization. These same schools were the focus of a study, three years previously, which focused on measuring the impact of a literacy initiative on pupil outcomes. The schools involved were selected from 19 schools that responded to an advertisement in the Irish National Teachers’ Organisation (teacher union) magazine inviting schools to engage in a literacy initiative in which they would be funded and supported by the union. Priority was given to urban DEIS schools who had a single class grouping in each classroom and who were not currently participating in any other reading intervention programme such as Reading Recovery. The findings can reasonably claim to be representative of urban disadvantaged schools in the ROI. Funding provided all materials, the input of project facilitators and release time from school for teachers to engage with the PD initiative. Additional support was provided in terms of two school visits from a project facilitator during the implementation period and access to support via email and telephone.

The initiative centred on pupils in third class (average age nine) and involved a special educational needs teacher and a classroom teacher working collaboratively within the mainstream classroom to facilitate peer tutoring (Topping 1988, Butler 1999) for literacy for 30 minutes a day, four days a week, over an eight-week to 10-week period. Peer tutoring involves pupils reading in mixed-ability pairs in the role of tutor and tutee in a bid to improve their reading accuracy and fluency. The initiative appeared to impact pupil achievement, with findings at the time suggesting an overall average improvement of 12.7 months in reading accuracy for pupils \(n = 116\) (as evidenced on results of pre and post standardized tests), high levels of pupils’ enjoyment and teachers’ willingness to sustain the practices beyond the initial input (King and Gilliland 2009). While these findings are not part of this study, the schools involved are because this study involved a return to the same five schools to explore the impact of the original PD initiative on teachers’ professional learning three years on. The rationale for this study came from the literature, which identified little evidence of sustainability of teaching practices in the longer term despite sustainability of practices being pivotal for school improvement (Baker et al. 2004, Priestley et al. 2011). This paper is a report of how the longer-term impact of a PD initiative was formally evaluated using an evidence-based framework.

**Evaluating the impact of professional development**

Evaluating the impact of PD in terms of schools having an awareness of the effectiveness of PD undertaken by teachers has been reported as the weakest link in the PD chain (Ofsted 2006). This is despite it being described as ‘a learning tool that improves the quality of both the CPD activity and the outcomes achieved’ (Earley and Porritt 2010, p. 147). The term ‘continuing professional development’ is used in some countries to refer to PD that takes place after initial teacher education while the term PD can be often associated with initial teacher education.
Given that the focus of this paper is on measuring impact of teacher PD that applies across the continuum of teacher education, the term PD will be used to reflect this continuum.

While there are an increasing number of focused, rigorous and causal impact research studies (Garet et al. 2001, Wayne et al. 2008) exploring the link between teacher PD and pupil outcomes, evaluation of PD within schools is often neglected by schools (Earley and Bubb 2004), is considered problematic (Rhodes et al. 2004, CUREE 2008) and is seldom carried out in a ‘systematic and focused manner’ (Muijs and Lindsay 2008, p. 196). Generally, it appears to be ‘instinctive, pragmatic and without explicit reference to clearly defined learning outcomes for teachers or students’ (Opfer et al. 2011, p. 452). Arguably, this may be due to either the contested notion of what constitutes teacher PD or not having the ‘experience, skills and tools’ to do so (Earley and Porritt 2010, p. 6). If PD is viewed in the traditional sense of ‘inputs’, such as courses, rather than the ‘actual development of knowledge and expertise (outcomes)’, then this may also impact on its evaluation (Bubb and Earley 2008, p. 5). This concept of PD reflects the definition by the New South Wales Institute of Teachers (2007, p. 3), who describe it as ‘the processes, activities and experiences that provide opportunities to extend teacher professional learning’ that ultimately focuses on pupil outcomes. The ‘outcomes’ in this study were in terms of teachers’ professional learning, which focuses on teachers’ implementation levels, knowledge, beliefs and practice. These have been referred to as mediating factors that are deemed ‘critical’ for drawing ‘conclusions about the theory of teacher change and the theory of instruction on which the PD intervention is based’ (Wayne et al. 2008, p. 475). Arguably, without knowledge of these factors, the PD intervention cannot be fully understood.

**Professional development evaluation: competing approaches**

One approach to PD evaluation involves using randomized control trials for eliciting causal claims related to impact on pupil outcomes (Whitehurst 2012). Such trials have contributed significantly to the literature on educational effectiveness and evaluation (Yoon et al. 2008). Increasingly more and more causal impact studies focusing on pupil achievement are being carried out (Garet et al. 2001). All of these studies add to the research base on specific PD interventions. However, the nature of such studies means that researchers are usually only able to isolate one intervention and look at a small number of effects and outcomes.

Arguably studies need to also focus on the complexity of teacher learning, teacher change and factors that can facilitate teacher engagement with PD (Kervin 2007, Wayne et al. 2008, Opfer and Pedder 2011) as the link between teacher PD and pupil outcomes is not automatic (Cumming 2002). A lack of understanding of teacher change has been reported to be responsible for widespread failure of change initiatives (Fullan 1991). There is therefore a need for a range of approaches, and this work is located in the latter tradition that seeks to evaluate impact on teachers’ professional learning.

To formally evaluate the impact of the PD experience in this study, an exploration of the literature was undertaken to identify a suitable framework to facilitate this. This included an exploration of a wide range of literature that has been associated with trying to establish how to measure impact on teachers’ professional learning. Within this tradition there are a number of comprehensive models that
have built on each other over the years, beginning with that of Kirkpatrick (1959); a model based on the business world that looked at four levels of impact as outlined below:

1. Participant reaction.
2. Participant learning.
3. Participant behaviour.
4. Organization results.

This model explored participants’ reactions and learning as a result of continuing PD and it also assessed participants’ changes in behaviour at the workplace and the effect this had on the workplace itself. A framework more specific to education was that by Stake (1967), who identified ‘antecedents’ (how things were before the programme), ‘transactions’ (what occurred during the programme) and ‘outcomes’ (results of the programme). The challenge with this framework lies in the difficulty of establishing the cause and effect relationship between a programme and its outcomes, as there may be many influencing variables from within or outside the programme; for example, teacher personal development or the programme itself (Holton 1996, Frost and Durrant 2003, Stevenson 2008). While a number of scholarly studies have focused on establishing cause and effect in relation to pupil outcomes, ‘much PD takes place in real-world settings where such experimental conditions are impossible to meet’ (Guskey 2000, p. 85). However, it is possible to gather some, “evidence” about whether or not professional development is contributing to specific gains in student learning” (Guskey 2000, p. 85). This ‘evidence’ may be in the form of pre and post measures as was used in the original study for looking at impact on pupils’ outcomes.

Thomas Guskey (2002) developed Kirkpatrick’s framework and introduced five levels of PD evaluation for use in a school context, the additional level being Organisation Support and Change:

1. Participants’ reactions
2. Participants’ learning
3. Organisation support and change
4. Participants’ use of new knowledge and skills
5. Students’ learning outcomes (Guskey 2002, p. 47).

Students’ learning outcomes replaced Kirkpatrick’s ‘Organisational results’ while participants’ use of new knowledge and skills replaced Kirkpatrick’s ‘Participant behaviour’. Guskey’s (2002) model was further developed by Bubb and Earley (2010) and comparisons and additional levels can be seen in Table 1.

The first three levels in Bubb and Earley’s (2010) model seek to facilitate PD planning, as evidence suggests that planning PD in advance can improve the outcomes for teachers and pupils (Earley and Porritt 2010). These planning levels have been adapted from Guskey’s (2002) suggestion to reverse his five levels of evaluation for PD planning. They also reflect Stake’s (1967) notion of antecedents in that they set out to establish how things were before the commencement of PD. Establishing a baseline in this way enables participants to plan the way forward and chart their development and progress over time, unlike Kirkpatrick’s (1959) model that seems to focus solely on evaluation of training.
Guskey’s (2002) level 1 is concerned with Participants’ Reactions and initial satisfaction with various aspects of the PD experience, which is reflective of the level of current evaluations used by many engaging in PD evaluations. Meanwhile, level 2 centres on Participants’ Learning to ascertain whether the intended knowledge and skills were realized by participants. Bubb and Earley (2010) also have similar levels (4 and 5) in their model, namely The Experience and Learning respectively. These focus on the same issues with the significant added dimension of a focus on ‘attitudes’ – acquired or enhanced. This is not explicit in Guskey’s (2002) model as he appears to assert that it is the practice or experience that will shape teachers’ attitudes and beliefs (Guskey 2005), even though others argue that this is a cyclical process with teachers entering the cycle at various starting points (Opfer et al. 2011). This raises an issue surrounding the concept of levels within evaluation or impact models, especially with Guskey’s (2000) assertion that these levels are successive and interrelated with one level building on the other and indeed success at each level being necessary for subsequent levels. However, Coldwell and Simkins (2011) point out that level 3 of Guskey’s (2002) model, Organisation Support and Change, which identifies contributing factors to support implementation and change, is not a consequence of level 2, Participants’ Learning. The same could be said of Bubb and Earley’s (2010) use of levels, which also suggests a hierarchical model. This hierarchy between levels has been critiqued by some (Holton 1996, Coldwell and Simkins 2011) who dispute the successive notion of levels and argue for a more intricate and nuanced model of evaluation that will encompass the complex nature of all the variables that affect teacher engagement with PD, teacher learning, teacher change and pupil outcomes. While a more nuanced model of evaluation will not facilitate establishing cause and effect, it may help individual schools and teachers gather evidence that may improve their understanding of what works for them in their context. Arguably ‘learning has individual and sociocultural features’ and it is therefore important to study teacher learning in various contexts (Borko 2004). Matching the method to the question is always the challenge (Whitehurst 2012) and such a model may be a useful method to help answer such questions.
Both Guskey’s and Bubb and Earley’s models agree on the need for organization support for implementation and change; this may be in the format of a change agent, leadership, policies or resources. Bubb and Earley (2010, p. 61) have Organisational Support as level 6, which identifies ‘how the school helps (or hinders) the person using their new learning in their job’. Guskey’s (2002) model also explores impact on the organizational climate and procedures at this level. What is not clear is whether or not this Organisational Support encompasses the specific characteristics for ‘high quality’ and ‘effective’ PD as advocated by other researchers (Desimone et al. 2002, Opfer and Pedder 2011). These reflect the need to explore the more complex relationships that exist and influence teacher engagement with PD. For example, one missing component from both of the above models is that of collaboration amongst teachers. Garet et al. (2001) and Desimone (2009) argue that collective participation in PD is an essential component of effective PD. Arguably teachers benefit from the support of collaborative practices to help facilitate teachers’ deep learning or conceptual knowledge related to practices, which results from a longitudinal study by Bolam et al. (2005) suggest is necessary for sustaining changes over time. Level 4 of Guskey’s (2002) model concentrates on evaluating Participants’ Use of New Knowledge and Skills and aims to measure the degree and quality of implementation of new practices. Bubb and Earley’s (2010, p. 61) model takes a similar but slightly different slant in that it focuses on Into Practice – the degree and quality of change in level 7 – to account for new products (such as policies), new processes (new or improved systems) and staff outcomes. They drew upon the work of Frost and Durrant (2003) and the Training and Development Agency for Schools (TDA) to explore different levels of impact on staff: classroom practice, personal capacity and interpersonal capacity. Given that the literature is replete with calls for teachers’ levels of engagement with practices to be at a deep, conceptual level for sustainability of practices (see, for example, Baker et al. 2004, Bolam et al. 2005, Priestley et al. 2011), it is essential to have a clear framework for measuring this. Hall and Hord (1987) provide such a framework for evaluation of implementation that outlines eight ‘Levels of Use’ (LoU) of implementation (see Table 2). Guskey (2000) offers an extensive discussion around these LoU but incorporating this explicitly into a framework may enable teachers and schools to use the LoU as a means of assessing participants’ degree and quality of change.

For sustainability of practices, teachers need to have the conceptual knowledge or deep learning related to the practice as evidenced at the routine and refined levels of use. Interestingly, Baker et al. (2004) argue that a considerable number of teachers never progress beyond the routine level of understanding and use. However, teachers may need support to progress through these levels (Hall and Hord 1987). This support may be in the form of creating collaborative cultures of teaching and learning (Hodkinson and Hodkinson 2005) such as professional learning communities (PLCs) or other forms of collaboration, team teaching practices, peer coaching or collaborative consultation to enhance the system’s overall capacity (O’Sullivan 2011). Such collaborative cultures may in turn impact on other beneficiaries (Stevenson 2008) where the impact of PD is extended to other teachers and pupils in a process described by Earley and Bubb as ‘cascading’ (2004, p. 84). This features in Bubb and Earley’s (2010, p. 68) model at levels 9–12 and is deemed ‘particularly challenging in schools with high staff turnover and poor communication’. PD that involves collective participation among teachers from the same school
may help sustainability of practices over time despite staff turnover (Garet et al. 2001). To facilitate such cascading of practices, school re-culturing may be required, recognizing that ‘the real agenda [for school improvement] is changing school culture not single innovations’ (Stoll and Fink 1996, pp. 45–46).

Notwithstanding Bubb and Earley’s (2010) acknowledgment of teacher attitudes as important in the implementation and change process, the literature emphasizes the importance of winning teachers’ ‘hearts and minds’ (Evans 2010). Some concerns have been expressed regarding little evidence of changes in teachers’ beliefs and values (Gleeson and O’Donnabháin 2009, Opfer et al. 2011) and therefore it is important to explore this as part of Bubb and Earley’s (2010) level 7 Into Practice – ‘Degree and quality of change’.

Finally, level 5 of Guskey’s (2002) model and level 8 of Bubb and Earley’s (2010) model focus on student learning outcomes. A particular strength of both models is the inclusion of impact on students’ cognitive, affective and psychomotor skills, which echoes the work of Bloom (1956).

An analysis of evaluation models and the relevant literature discussed above revealed a number of strengths and areas for further exploration in existing frameworks (for example, Kirkpatrick 1959, Stake 1967, Guskey 2002, Bubb and Earley 2010). As a consequence, the framework for this study sought to deliberately build on previous work, in particular Guskey (2002) and Bubb and Earley’s (2010) ground-breaking work, and add to it. This led to a synthesis of findings and, for the purposes of this study, the development of a new Provisional Framework (Figure 1). This new provisional model sought to acknowledge the strengths of previous

Table 2. Levels of use of the innovation (Hall and Hord 1987).

| Level of use | Behaviours |
|-------------|------------|
| Users       | Renewal    |
|             | Makes major modifications in the innovation or their innovation use to improve the impact on pupils |
|             | Examines new developments in the field |
|             | Integration |
|             | Commitment to use the innovation with other teachers to provide a collective impact on pupils |
|             | Makes changes to accommodate the use of innovation with another teacher |
|             | Refinement |
|             | Makes changes to enhance the impact on pupils in their class |
|             | Routine |
|             | Established use of the innovation |
|             | Little thought about improving innovation use |
|             | Not making any changes to it |
|             | Mechanical |
|             | Concerned with logistics and organizational issues |
|             | Clings to the user guide |
|             | Makes changes to suit user needs |
|             | Focuses on short-term, day-to-day use of the innovation |
| Non-users   | Preparation |
|             | Makes a decision to use the innovation |
|             | Orientation |
|             | Takes action to learn more detailed information about the innovation (e.g. looks for information about the innovation – talking to others, attending a workshop; explores the possibilities for use of the innovation) |
|             | No commitment to use the innovation |
|             | Non-use |
|             | Absence of innovation-related behaviour – no knowledge, involvement and doing nothing toward becoming involved |
models whilst also addressing other aspects identified in the literature, especially in the area of collaborative practices, which are highlighted as essential components for teacher learning, sustainability of practices and whole-school change and development. This Revised Framework also included teachers’ deep learning, teacher commitment and teacher ownership of practices which were also highlighted.

Figure 1. Provisional professional development impact evaluation framework.
Source: Adapted from Guskey (2002) and Bubb and Earley (2010) and drawing from Hall and Hord (1987) with additions from the literature as indicated by the shaded areas.
in the literature. As this study focused on the people who participated in PD for implementation of a literacy initiative and had no prior use of this initiative, it could only explore their (the users’) LoU (Hall and Hord 1987) and therefore the non-users’ levels were not included in the framework. While this may be seen as a limitation, the findings are not to establish causal inference for generalization, as is common with case-study research. Nevertheless, ‘assertions’ (Stake 1995) or ‘replication’ may be claimed when two or more cases are shown to support the same theory (Yin 1994, p. 31). Furthermore, an amalgamation of the refined and integrated LoU similar to that used by Baker et al. (2004) was employed for this study, because the initiative being evaluated was collaborative by nature and therefore separate headings were considered inappropriate.

Additionally, more emphasis was placed on teacher attitudes and beliefs given their significance as being central to the change process (Opfer et al. 2011). This Provisional Framework guided data collection and analysis as outlined in the methodology. It was critiqued following application in this study and refined resulting in an evidence-based PD Impact Evaluation Framework that may help to address the need for a tool or common conceptual framework (Desimone 2009) for evaluating the impact of teacher PD at a time when demonstrating the impact of PD, and indeed its value for money, are becoming increasingly important.

Methodology
A multiple case-study approach was used to carry out this qualitative research initiative, which sought to explore the impact of a PD initiative on teachers’ learning in five urban disadvantaged schools in the ROI, using the devised Provisional Framework (Figure 1). Within each of the five schools the sampling used was purposive given that it was a follow-up from an initial research project in which there was a class teacher, special needs teacher and principal from five schools. However, due to staff turnover and the flexible nature of case-study research, it was possible to interview people in those schools who had subsequently become involved in the initiative, to facilitate an exploration of the ‘legacy’ (King 2012) of the PD initiative in these schools.

A conceptual framework, which is the ‘current version of the researcher’s map of the territory being investigated’ (Miles and Huberman 1994, p. 20), was used for directing the data collection. The framework used was initially based on Miles and Huberman’s (1994, p. 18) ‘Conceptual Framework for a Study of the Dissemination of Educational Innovations’ and was adapted for use in this study. The extensive literature review and analysis of existing evaluation models led to the development of a Provisional Framework that incorporated all aspects from the original map and reflected the improved understanding of the ‘terrain’ (Miles and Huberman 1994, p. 18). This subsequently guided the research design and process. The contents are largely based on the work of Guskey (2002) and Bubb and Earley (2010) and supplemented from various other sources – for example, Hall and Hord (1987). The sections in grey reflect the ‘study propositions’ from the literature that helped direct the research design, even though the propositions that were outlined at the beginning of the research may no longer have been valid following data analysis (Yin 2009, p. 34). Therefore, the propositions included in this Provisional Framework, which were predicated on the literature, were critiqued as part of this research.
Given the context of this study the Provisional Framework deviated from Bubb and Earley’s (2010) levels 1–3, which emphasized the importance of establishing baseline data and planning the PD experience. However, research baseline data for teachers’ learning did not exist because at the time of the original PD it was initially not intended to return to this cohort of teachers. Whilst the absence of a baseline assessment does suggest limitations in the research design (that are acknowledged here), it was nevertheless still possible to use retrospective recollections from teachers to explore the impact of the PD initiative three years on. It is also consistent with the approach used by Baker et al. (2004), who used interviews four years after initial implementation to establish whether teachers sustained a mathematics initiative and with what levels of use and understanding they had done so. The initial concerns about teachers’ ability to remember how things evolved over time were allayed through probing for details during interviews. Teachers’ self-reporting of data in interviews has been shown to be relatively consistent with findings from observations and surveys (Desimone 2009) and arguably self-reporting may be deemed appropriate given the study’s research question (Desimone et al. 2002, Desimone 2009), which in this study sought to explore teachers’ perceptions of the impact of a PD initiative at various levels: on a personal level, a professional level, a collective level and on pupils’ outcomes. Findings were based on teachers’ accounts of experiences and behaviours at these levels and not on judgements of quality that may help maximize reliability (Desimone et al. 2002). Furthermore, findings are not claiming cause and effect but rather are seeking to add a contribution to the current debate which aims to move understanding of teacher engagement with PD, teacher learning and teacher change forward. It is acknowledged that these contributions will need to be further tested.

The Provisional Framework (Figure 1) informed the research questions and subsequent interview questions with the 20 participants from the five schools. It was therefore devised, applied, tested and critiqued in the current study. While this is a small-scale case study the emphasis was on a trustworthy study (Hammersley 2007), and ‘replication’ can be claimed when two or more cases are shown to support the same theory (Yin 1994, p. 31). Results from each of the five case studies in this research provide extensive evidence to back up findings, and conclusions were reached only after the findings were tested or confirmed through checking rival explanations, variables and feedback from interviewees where necessary (Miles and Huberman 1994, Punch 2009, Yin 2009).

Applying and testing the framework

The framework was operationalized for use in this study through linking a set of research questions with each section of the framework; for example, The Experience section of the framework led to questions around teachers’ and principals’ satisfaction with the PD experience, along with their motivation for engaging with it. Similarly the section on Learning explored how teachers describe the impact of the PD experience. In this way, the framework guided the research and subsequent interview questions regarding where to collect relevant data, what kind of data and from whom. The questions sought to: focus on short-term and long-term impact in an effort to fill the research gap relating to sustainability of new practices in schools; explore the factors that helped or hindered the development and sustainability of PD practices; and assess impact using the evaluation framework devised from the extant literature.
The sections of the framework dealing with The Experience, Learning and Organisation Support focused on short-term impact of the PD initiative. The section on Into Practice is the largest section and focused on the long-term impact, measured in terms of process, product and staff outcomes. Pupils’ Outcomes were evaluated at various levels as highlighted on the framework by exploring teachers’ perceptions of pupils’ outcomes because these have been deemed highly significant given that teachers’ beliefs about pupils’ outcomes impact on continued use of practices (Baker et al. 2004, Boardman et al. 2005). Many pupil outcomes are judged by teachers’ observation and teachers are more likely to sustain practices where they perceive pupils enjoy the practice and where they witness pupil growth through formative assessment during the practice (Boardman et al. 2005). This is reflected in one principal’s comments:

The fact that it has been sustained is … because the general feeling is it’s a very worthwhile thing to do … we’re getting results. They might not be measurable but there are benefits.

Even though this study did not explicitly measure pupil outcomes, the PD initiative implemented here is associated with gains in pupil achievement (Topping 1988, Butler 1999), which were also reflected in the original study in 2007/08 (King and Gilliland 2009). Whether or not there was a cascading of knowledge and practices is explored in the Cascading section on the framework. Following application of the framework (through the research and interview questions) and data analysis, it was further refined and those refinements are reported and discussed later in this paper.

A rigorous, transparent and systematic approach to data analysis was employed (Robson 2002, Bryman 2004). The use of a software package, QSR NVivo 8, facilitated the collection and storage of data in an organized manner. Interviews were transcribed as soon as possible after being carried out so that contextual cues and non-verbal cues were not lost (Silverman 2000). Descriptive or topic codes were used on initial readings. Inductive data analysis was used where the codes were not predetermined (Bryman 2004, Gray 2004). Interestingly some of the initial codes were quite reflective of the headings on the Provisional Framework. This alignment between emerging codes and the PD framework headings helped in the critique of the framework itself for use as a tool for evaluating PD. This might have been expected given that the framework was developed from the literature and exploration of previous models of evaluation. However, the data analysis was sufficiently robust not to be constrained by the framework. Codes changed with further levels of analysis and moved from more specific and concrete to more general and abstract (Punch 2009). On subsequent readings the relationship between some codes appeared and memos developed (Punch 2009). This led to a second round of codes and so the iterative process of data analysis continued, with explanations devised for each code along the way. This also provided a clear audit trail to assess procedures and findings (Lincoln and Guba 1985). These explanations were then used to code the data on subsequent readings and led to data reduction through merging and omission of certain codes with similar meanings; for example, pedagogy and knowledge – conceptual level were omitted and merged under use of knowledge and skills – routine level and refined/integrated level as this is reflective of having a conceptual knowledge of the practice. Analysis continued in this way with data reduction, data display through the revision of codes and definitions, and drawing
and verifying conclusions (Miles and Huberman 1994). The final round of codes resulted in the Provisional Framework (Figure 1) being developed to reflect the codes arising from the data analysis as outlined in the next section.

Findings

While the study focused on exploring the short-term and long-term impact of a PD initiative and the factors that helped or hindered the development and sustainability of the initiative, the focus of this paper is on the design and development of an evaluation framework that was used to assess the impact of a PD initiative within the context of the study. Therefore the findings as reported here relate to the design and development process of the framework.

Figure 2. The revised PD impact evaluation framework.
Source: Adapted from Guskey (2002) and Bubb and Earley (2010) and drawing from Hall and Hord (1987) with changes following data analysis indicated by the shaded areas.
Following application and testing of the Provisional Framework as outlined above, its suitability for evaluation of the PD initiative was assessed through data analysis as described. Overall, findings indicated that the framework was ‘fit for purpose’ in evaluating the impact of the PD initiative in this study. While most of the headings on the framework worked well, some were merged and others renamed, leading to further development and refinement of the framework (Figure 2). These developments will be now explained in detail under each heading of the Revised Framework.

The Experience was concerned with teachers’ satisfaction with the initial PD off-site training experience.

Learning was intended to focus on new or enhanced skills, attitudes and knowledge in the short term; that is, the initial eight-week to 10-week implementation of the literacy initiative. However, given the nature of this PD initiative, which comprised one full day’s PD followed by two schools visits and email/telephone support over the implementation period, it became clear that this section of the framework could not be used to assess learning over this length of time. Data related to this initial implementation period highlighted factors from all other levels of the framework: Organisation Support; Into Practice – Degree of Quality and Change; Pupil Outcomes; and Cascading. However, some participants did refer to the learning on the initial training day and so this Learning section remains on the framework but is only suitable to assess new or enhanced knowledge, skills and/or attitudes acquired on the day of a PD experience, activity or course. The Experience and Learning are quite reflective of much PD evaluation, which centres largely on teacher satisfaction with the PD experience. To explore impact on teachers’ learning, responses from participants about the short-term (initial implementation period) and long-term implementation (three years later) of the practice were recorded under Into Practice – Degree of Quality and Change and under Cascading.

**Organisation support**

Findings from the data showed that Organisational Support alone was not sufficient to support teachers in their implementation or sustainability of the literacy initiative. The research clearly identified three consistent features of teachers’ professional learning for teacher engagement with implementation and sustainability of the practice, which may contribute to improved understanding and deeper insights into the variables that affect teacher engagement with PD, teacher learning and pupil outcomes.

**Support**

Teachers were supported by leadership, PLCs and an advocate or change-agent. Leadership support was the mechanism through which other supports, such as the development of PLCs and the modelling of practices by an advocate (someone who is driving and supporting the practice), were enabled to develop (King 2011).

**Initiative design and impact**

The structure and design of the literacy initiative, along with its success for students, were significant factors in its ‘legacy’ (King 2012). While the concept of structure may be reflective of that identified by Garet et al. (2001) it may also add to this debate as all participants commented on the structure of the initiative as
being highly influential in their implementation and sustainability of the practice. One teacher reported finding the PD initiative or practice to be implemented as ‘feasible, focused and very structured’. While none of the teachers engaged with the initiative because it was collaborative per se, some reported finding the collaborative team teaching aspect influential in its sustainability, as teachers felt they learned from each other. Perhaps surprisingly, the fact that it was a self-contained initiative for a clearly defined block of time helped secure teacher support, as it reduced teachers’ fear of committing to long-term change. Nevertheless, this short, sharp approach to PD initiatives may be persuasive for others who are seeking to effect change in their schools, because while the initiative itself was time bound, the effects seeped through to other aspects of teachers’ practice on a longer-term basis. The success of the initiative in terms of pupils’ outcomes was highlighted by all teachers, albeit at different levels: cognitive, affective and psychomotor, as outlined on the PD evaluation framework.

**Teacher agency**

Teachers are the change-agents or gatekeepers of change in the PD process (Guskey 2002, Bubb and Earley 2010, National Council for Curriculum and Assessment 2010) and their openness and willingness to engage with and sustain the practice were significant in its survival. Notable too was evidence of ‘deep learning’ where teachers understood the pedagogy behind the initiative and were able to adapt it to suit the needs of their pupils in their context. Similarly, teachers reported the practice meeting their personal and professional needs as an important factor in its sustainability. Underpinning this was evidence of teacher agency; that is, teachers acting in intentional ways to ‘shape their own responses to problematic situations’ (Fallon and Barnett 2009, p. 12).

Teacher professional learning is a complex process involving the interconnectedness and interdependency of teacher agency, the initiative itself and the pivotal role of support, as emerged from findings in this study. Therefore the section Organisation Support was replaced with Systemic Factors to account for these significant additional features that may better represent the complex relationships between teachers, PD and outcomes. This is reflective of arguments posited by some who argue that PD is contextual and subjective (Prosser and Trigwell 1999, Bottery 2006) and it resonates with Borko’s elements of a PD system: PD programme, teachers, facilitators and context (2004, p. 4). This echoes an underlying ontological position that the reality of the social world is complex and constructed by the participants who engage within it. Understanding the subjective world of human experience may help enhance the impact of PD. While existing literature has contributed a lot to the concept of ‘high quality’ and ‘effective’ PD, it is hoped that these aspects may contribute to this ongoing debate and reflect the complexity and importance of understanding under what conditions, why and how teachers learn (Opfer and Pedder 2011). However, it is acknowledged that these systemic factors need further rigorous testing in a variety of settings and using a range of methodological studies.

**Into practice – degree and quality of change**

This was used to explore the impact of the PD initiative on the teachers’ professional learning. It was largely based on that of Bubb and Earley’s (2010) framework
with additions from the literature, as indicated by the shaded areas in Figure 1. The data showed evidence of new products and processes following engagement with the PD experience and it confirmed what Earley and Porritt (2010) stated about processes being necessary to enact certain products; for example, while schools may have had a new policy regarding implementation of the literacy initiative, which came under the heading products, certain processes, such as timetabling this at the beginning of the year, needed to be put in place to act upon these products. Many other processes reported by participants were reflective of collective practices and so were recorded under that heading.

Staff Outcome resulted in some additions and mergers of headings. For example, at a Personal level there were initially two sub-headings as seen in Figure 1: feelings and thinking related to classroom teaching, and beliefs and attitudes towards pupils’ learning. On second-round coding, another level was added: feelings and thinking related to collaborative practices. However, following data reduction two of these sub-headings were merged into one: beliefs and attitudes related to classroom teaching and pupils’ learning, while the heading of feelings and thinking related to collaborative practices was transferred to the Collective heading. The data revealed that teachers’ beliefs, values and attitudes were instrumental in the sustainability of the practice and that changes are iterative and can begin with a change in teacher beliefs leading to a change in practice or can begin with a change in practice leading to a change in beliefs. One teacher reported engaging with the initiative as other teachers believed in it: ‘I heard the results from teachers who had done it before were very good and positive towards improving literacy’. This is reflected in the literature, where it is argued that change may be influenced by opinions and beliefs of others (Boardman et al. 2005, Mathews 2010). So changes in practice occurred by ‘word of mouth’ as cited by one principal, while another commented:

We’ve moved totally now. It’s all collaborative today. It wasn’t then. I just know we’ve shifted enormously in our thinking. I can’t say where it began or ended.

Another example of change included teachers’ beliefs about the value of pupils working in pairs, leading to further practices involving pairing of pupils. The positive impact on pupils led to sustainability of the practice and also encouraged others to engage with it, as they valued other teachers’ opinions about its success and value (Boardman et al. 2005).

Teachers also expressed a sense of confidence and efficacy in relation to the teaching of reading in this way and therefore teacher efficacy was transferred to the Personal level because it is connected with teachers’ sense of how effectively they can teach and a sense of their power to effect change, with correlations between affect and efficacy (Kitching et al. 2009, Morgan et al. 2009).

Similarly, some teachers’ experience of this literacy practice led to changes in beliefs and values about collaborative practices among teachers, which in turn led to the adoption of other collaborative practices. This is reflective of Opfer and colleagues’ (2011) cyclical nature of teacher change, which focuses on the interplay between these variables, in favour of Guskey’s (2005) model, which argues that change is linear with changes in beliefs following a change in practice. This section, Personal, therefore looks at impact in terms of teachers’ beliefs, as they may influence teacher efficacy, practices and pupils’ outcomes.
In the Professional section there was a merger of the existing headings of teachers’ knowledge of innovation and use of new and improved knowledge and skills, as these can be described at three levels, mechanical, routine or refined/integrated (Hall and Hord 1987, Baker et al. 2004), and are reflective of knowledge at procedural and conceptual levels. This heading became the quality of use and understanding of new and improved knowledge and skills. However, it was decided to rename the mechanical level of understanding and use to Technical, because the former suggests something that is automatic or routine whereas technical is more concerned with the logistics and organizational or procedural issues as suggested by Hall and Hord (1987) in their descriptors of behaviours at that level.

Findings also indicated a link between data at Hall and Hord’s (1987) routine levels of quality of use and understanding and that of teachers’ knowledge of pedagogy. However, characteristics at the routine level show teachers’ conceptual understanding related to the initiative itself, whereas pedagogy encompasses more than this; it is concerned with enabling the learning and intellectual growth of pupils in contrast to instruction that treats pupils as the object of implementation (MacNeill et al. 2005). This is reflected in one teacher’s comments about pupils’ dictionary skills:

It’s the simple things in third class, you would think they know ABC, the order, but they don’t. They know to find S [the first letter of the word] but that’s it. We do it every so often, but we don’t really teach them. We don’t keep doing it.

Therefore routine was changed to accepted levels of understanding and use, as the primary focus seems to be on teachers accepting that the initiative is working well for their pupils. Teachers’ comments indicate evidence of conceptual knowledge as it relates to the initiative itself and knowledge of pedagogy, how pupils learn the subject, which has been identified in the literature as being influential on pupil learning (Kennedy 1997, Garet et al. 2001).

Meanwhile, the refined/integrated level of understanding and use focuses on making changes to enhance the impact on pupils and working with other teachers to provide a collective impact on pupils. The data are somewhat reflective of the data related to evidence of shared pedagogy and pedagogic content knowledge; that is, ‘knowledge of ways of representing specific subject matter for pupils and an understanding of the difficulties they may face because of their existing conceptions’ (Smith 2007, p. 378). However, the data here reflected teachers’ focus on how pupils learn the subject despite the various difficulties, ‘misconceptions’ or ‘preconceptions’ they may have (Garet et al. 2001, p. 924). This necessitated teachers critically engaging with the practice and demonstrating an expertise; that is, an ability to adapt programmes to meet the needs of individual pupils (Boardman et al. 2005). The initiative involved pupils working in mixed-ability pairs, but one teacher having critically engaged with the impact of the practice on the pupils decided that two same-ability pupils would gain more by working together: ‘… the top two children (most able) in the class to get them working together … but it’s only in your class you’ll figure that out’ (class teacher). This explicit emphasis on pedagogic content knowledge and teachers critically engaging with the initiative resulted in changing ‘refined/integrated’ to critical.

Findings also revealed that some teachers discontinued the literacy practice, and therefore a Discontinued level was inserted to reflect this. While Hall and Hord’s (1987) three levels of non-users were not applicable to this study, they may be of
relevance in other situations for assessing impact, and are therefore included in the Revised Framework (Figure 2), hereafter referred to as the PD Impact Evaluation Framework.

Underpinning all levels of teacher engagement is teacher agency, which may be considered a requirement more than an impact, and therefore the heading human agency was removed from the framework. Commitment and ownership was omitted as it forms part of teacher agency, as teachers are showing commitment and ownership when they are acting in intentional ways to enable change.

Moving to the Collective section of the framework, some headings were collapsed into each other and replaced with the term Cultural to reflect the way things are done in a school (Norris 2004); for example, the forms of collaboration that ensued from this initiative and the development of PLCs. Staff morale was omitted, as the data were categorized under affective levels also and therefore a separate heading was not required. Interpersonal capacity was merged with PLCs, as data from the interviews were coded under both headings. Many of the concepts associated with Frost and Durrant’s (2003) interpersonal capacity are similar to those of PLCs, with the latter including the important additional aspects of teachers having collective responsibility for pupils’ learning, shared values and vision, and reflective professional enquiry; essential components for enhancing pupils’ outcomes and building capacity for school improvement (Hodkinson and Hodkinson 2005, O’Sullivan 2011). Therefore they need to be explicitly included and evaluated as part of any evaluation of PD, and not just expected as part of their performance management.

Taking cognisance of Staff Outcomes at Personal, Professional and Cultural levels may help to provide a more explicit approach to looking at the depth and degree of teacher understanding and use of new practices.

**Pupils’ outcomes**

This section had no changes following data analysis as the findings reflected samples of impact on pupils at each of the levels in Figure 1.

**Cascading**

This section emerged as highly relevant despite no mention of cascading to adults or pupils in other schools. While this aspect of cascading was not directly relevant to this research, it is important to remember that relying exclusively on site-based learning may lead to lost opportunities for sharing of ideas and resources, less collaboration among teachers from various contexts, less efficient use of outside expertise and less exposure to a broad vision for improvement (Guskey 1996). Therefore, these remained on the framework, as many PD experiences will occur off-site. However, it was decided to change the term Cascading to Diffusion, as the former suggests a deliberate, planned, downward movement whereas Diffusion is more reflective of an organic unplanned ‘rippling’ of practices that appeared to occur in this study where teachers identified an initiative they wanted to engage in and secured the pivotal support of leadership (King 2011). This may be reflective of teachers becoming leaders themselves and taking ownership of pupils’ learning, which arguably contributes to sustainability of practices.

While this study involved using teachers’ retrospective recollections, future studies would aim to establish a baseline from which to plan PD experiences and measure impact as endorsed by Bubb and Earley (2010). Therefore a further three
levels were added to reflect Bubb and Earley’s (2008, p. 61) three levels of ‘baseline picture, goal and plan’, where schools review where they are currently by gathering evidence and then prioritizing what they want to achieve, setting a target and then devising plans to get there: in essence, self-evaluating. Following all additions, mergers and omissions of headings, the PD Impact Evaluation Framework is that shown in Figure 2. It is hoped that this detailed framework may contribute to the academic debate on measuring impact of teacher PD through exploring impact on teachers’ professional learning at a time when some policy-makers, government departments, researchers and schools are struggling to show that teacher PD makes a difference. It may also offer some insights into understanding ‘under what conditions, why, and how teachers learn’ (Opfer and Pedder 2011, p. 378). While the ultimate goal of teacher PD is enhanced pupil outcomes, it is accepted that the impact on pupils is mediated by teacher knowledge, skills, attitudes and practices in the classroom (Yoon et al. 2008). If any of these aspects are missing then this may impact on pupils’ outcomes. Therefore it is important that we look at impact of PD with these aspects in mind; as outlined on the framework.

**Conclusion**

This paper explored how the impact of a PD initiative was evaluated in the context of teachers’ professional learning in five urban disadvantaged primary schools in the ROI. While the need for schools and teachers to assess and evaluate PD has been highlighted by many (for example, Ofsted 2006, Earley and Porritt 2010, DES 2011), it remains problematic for some.

Although previous frameworks for evaluation exist, some additional aspects for exploring the impact of PD were noted in the literature and following data analysis in this study. These additions came under the headings of: Systemic Factors, Diffusion and Staff Outcome including Personal, Professional and Cultural impact. Given that the links between teacher PD, pupils’ outcomes and school improvement are not automatic, it is necessary to focus on the processes that facilitate such links, something this new framework takes into consideration through its Systemic Factors. These factors acknowledge that change is contextual and influenced by a myriad of factors which can result in change impacting in different ways. Teaching and learning are contextual, and ensuring that PD processes take cognisance of individual professional identities, dispositions, roles and the setting in which teachers work is important to ensure improved outcomes for pupils (Prosser and Trigwell 1999, Hodkinson and Hodkinson 2005, Bottery 2006). In this way, the framework aims to contribute to a more complex and nuanced approach to understanding PD and its impact on teacher learning and may be more reflective of the complexity of the social world (Coldwell and Simkins 2011). These systemic factors may help schools and teachers when planning teacher PD experiences with the outcomes in mind.

Another contribution to previous frameworks was the significant role that teacher attitudes and beliefs play in the sustainability of practices, as evidenced in the literature and this study. Therefore these were made more explicit in this new framework under the heading of Staff Outcome – Personal. In the Professional context the importance of systematically exploring the depth and quality of use and understanding of new and improved knowledge and skills (Hall and Hord 1987) is acknowledged in the literature and in the findings of this study, where teachers’ deep levels of learning or conceptual understanding of practices are deemed
essential for sustainability of practices (Baker et al. 2004). The framework also includes an emphasis on collaborative practices which are identified in the literature as the cornerstone for change. Collaborative professional dialogue and practice are required for school improvement and therefore emphasis on this is included in the Cultural section of the new framework. The final contribution in this new framework is in the area of Diffusion, which is something to be considered at the outset of PD experiences where schools may consider how new practices may be disseminated to others to enable sustainability of practices for school improvement, whilst recognizing that ‘diffusion’ is both a formal and an informal process. Hence, diffusion is considered more apt than cascading in a top-down fashion, as it may answer the need to support teachers’ openness and willingness for change. Despite this there is an acknowledgement that sometimes a mixture of pressure and support may be needed for change to occur (Stoll and Fink 1996).

While this devised framework is a representation of the design and development of an evaluation framework that was used to assess the impact of a PD initiative within the context of the above study, it may be useful in helping teachers and schools fulfill the need for PD to be adequately evaluated and to move from looking at teacher satisfaction to exploring impact on teacher practices, which in turn aim to enhance pupils’ outcomes and school improvement. Significantly for teachers, it can enable them to assess the impact of their own PD, and to know whether what they are doing is ‘making a difference’ to their own learning and that of their pupils. This demonstration of professional responsibility may be a richer form of accountability and one that is more ‘fit for purpose’ (Collins and Dolan 2011, p. 87) than the current emphasis in many countries on over-using standardized test results as the principal means of judging school improvement. Where schools use this PD Impact Evaluation Framework to plan and assess their PD it may help promote individual and collective responsibility for pupils’ success. This shared responsibility may in turn help teachers to link PD with school improvement (Pedder et al. 2008) and to promote strong mutual trust within the education system. While this detailed framework seeks to contribute to existing academic research within an approach to assessing and evaluating teacher PD that explores impact on teachers’ professional learning, it is acknowledged that this is an ongoing process that will need to be continually re-visited and re-explored in future studies. Given the elusive nature of impact assessment, this must inevitably be an ongoing project. However, it is hoped that this framework provides a robust response to Bubb and Earley’s (2008, p. 6) call, ‘to design and test a series of questions for school staff about the quality of learning resulting from the opportunities made available to them’.

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