

RESEARCH AND TEACHER EDUCATION: THE BERA-RSA INQUIRY
**REVIEW OF ‘RESEARCH-INFORMED
CLINICAL PRACTICE’ IN
INITIAL TEACHER EDUCATION**

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ABSTRACT

The recent ‘practicum turn’ in initial teacher education (Mattsson et al, 2011) places a much greater emphasis on the role of ‘practical’ or ‘field’ experiences in the process of learning to teach. Although this move has frequently been advocated by critics of university providers, seeking to eliminate perceived problems of ‘producer capture’, it has also been advocated by many within the university sector in light of their understandings of the complexity of teaching and of the nature of professional learning. They are aware not only of the fundamental importance of practical experience for beginning teachers, but also of the rich seams of knowledge, understanding and skill to which beginners can gain access in the practice of experienced teachers. Their concern, however, has not been not to replace research-based understandings of effective practice with practice itself, but to integrate the different sources of knowledge, bringing research-informed perspectives into dialogue with classroom practice and the professional understandings of classroom teachers in

ways that allow beginners to make sense of, interrogate and learn from them all.

The first aim of this paper is to examine the kinds of relationship between research and practice that have been envisaged in calls for, and programmes designed to provide, opportunities for beginning teachers to engage in ‘research-informed clinical practice’. Although the precise terminology varies, the scope for inclusion within this review is specifically defined by the intention to facilitate and deepen the interplay between the different kinds of knowledge that are generated and validated within the different contexts of school and university. The notion of ‘research-informed’ field experiences encompasses not only the research about effective teaching on which university tutors draw to generate suggestions for practice, but also the research into the processes of professional learning that is used to inform and review the structure and design of the teacher education programme itself. A variety of approaches have been taken to achieving this kind of

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integration. While extending the time spent in school has been a feature of many of the programmes that seek to bring the different kinds of knowledge into dialogue, others have focused much more on the processes by which knowledge is created, for example by equipping beginning teachers to act as researchers, adopting a rigorous problem-solving orientation to practice. A range of different approaches within and beyond the UK are therefore examined, acknowledging the policy contexts within which they have been developed and comparing the rationales advanced in support of them.

The final section of the paper examines the claims that have been made for the impact of such research-based clinical practice and the quality of the evidence advanced in support of those claims, both as they relate to the impact of such experiences on teachers' professional learning and as they relate to student outcomes. The latter, it must be acknowledged, have so far been much less intensively researched, and – as is the case in seeking to establish the impact of any specific programme of teachers' professional learning – direct correlations are notoriously difficult to establish. Not only does the inevitable variety that results from greater involvement of large numbers of individual schools in teacher education programmes make general claims difficult to assert even at the level of a single programme, but also the variety of programmes within particular contexts makes system-wide claims more complex still.

INTRODUCTION: WHAT IS MEANT BY THE TERM 'RESEARCH-INFORMED CLINICAL PRACTICE'?

Any examination of the history of teacher education quickly reveals widely divergent views about the relative importance of the two elements of professional education generally identified as 'theory' and 'practice'. Crudely speaking, the former has been regarded as 'propositional' knowledge (claims about the nature of teaching and learning) derived from empirical and theoretical research in the foundation disciplines of education – philosophy, history, psychology and sociology. The latter has been equated with personal classroom experience – getting one's hands dirty at the chalk-face. Both conceptions, however, are inadequate. As Furlong (2013) has demonstrated, the nature of what is meant by 'education(al) research' has changed dramatically over the past 100 years, as have our conceptions of the 'craft knowledge' or 'practical wisdom' of classroom teachers. The twin components of the phrase 'research-informed clinical practice' therefore each need careful examination, before elaborating the nature of the interplay between them.

Ways in which initial teacher education (ITE) might be defined as 'research-informed'

In place of the four 'foundation' disciplines dominant

in the 1960s (Tibble, 1966) educational research is now characterised by its breadth, multi-disciplinary nature and diverse methodologies (Yates, 2004). The influence of the Schools Council promoted a strong focus on subject-specific pedagogy (Furlong, 2013), and encouraged the notion of practitioner as researcher (Stenhouse, 1970). Further transformation was wrought by the postmodern critique of positivist perspectives (MacLure, 2003) and by the explosion of social theory. Thus the research that might inform ITE ranges equally widely: from neurological investigations of the human brain to large-scale, multi-method cohort studies examining different variables within and beyond schools and detailed socio-cultural studies of the complex activity systems found in classrooms and subject departments. Its substantive focus encompasses learning processes and outcomes for different students and for beginning teachers themselves.

Claims about engagement in 'research-informed' practice thus convey a number of potential meanings. The most obvious is that those insights from the diverse field of educational research regarded as most relevant to their practice in particular contexts are introduced to beginning teachers and brought to bear on their decisions and actions as they begin to practise within those contexts (Hagger and McIntyre, 2000). It is thus an emphatic rejection of professional learning conceived of either as imitation (as embedded in the pupil-teacher or apprenticeship models of the late 19th Century) or as trial and error. It is also a rejection of more elaborated notions of experiential learning that emphasise 'reflective practice', but in which it is experience alone that constitutes the focus for reflection (McIntyre, 1993). Describing ITE programmes as 'research-informed' may also mean that research into the nature of experienced teachers' professional knowledge is used to find ways of making that expertise explicit to beginners. Such research has focused, for example, on enabling expert teachers to articulate their pedagogical decision-making, making their tacit craft knowledge explicit, both in dialogue with novices who have observed their teaching (Hagger, 1997) and through processes of collaborative planning (Burn, 1997).

Other claims to 'research-informed' practice rest on the use of research into the nature of beginning teachers' learning to inform the structure and sequence of ITE programmes (McIntyre, 1988) or refer to on-going processes of data collection and analysis used to evaluate and further develop such schemes (McIntyre, 1997; Ellis, 2008).

Definitions of 'clinical practice'¹

The concept of 'clinical practice' is potentially ambiguous even without the medical parallels it invokes, since 'practice' can be understood both as routine ways

¹ In addition to the meanings discussed below, the term 'clinical practice' is also often used to denote laboratory-based clinical experiences within the university setting, particularly forms of micro-teaching or simulations involving other pre-service teachers rather than school students. Such exercises focus on using 'approximations of teaching rather than the experience of total immersion in a school' (Levine, 2010: 9). Although these elements are often (but by no means always) a feature of the carefully integrated ITE programmes examined in this paper, we have not included any detailed analysis of such laboratory-based clinical experiences.

of working and as a deliberate process of rehearsal, intended to refine particular skills. Since this paper focuses on ITE, its emphasis is on the latter – the experiential processes by which novices develop their abilities to teach effectively. To declare that those processes constitute 'clinical practice' is not only to claim an affinity with medical education, but also to highlight particular features attributed to professional learning. Alter and Coggshall (2009) summarise the key characteristics of a 'clinical practice profession' as being the centrality of the clients (students) within it and the knowledge demands on the practitioner, whose work requires the use of evidence and judgment (rather than pure technical skill), and is conducted within a community of practice operating with shared standards. Kriewaldt and Turnidge (2013) similarly emphasise the importance of 'clinical reasoning', a term they regard as synonymous with 'clinical judgment or decision-making in medical literature' that serves to describe the 'analytical and intuitive cognitive processes that professionals use to arrive at a best judged ethical response in a specific practice-based context' (2013:106).²

Appropriation of the term 'clinical practice' is thus another claim that the school-based elements of ITE programmes again cannot be construed merely as providing scope to learn from experience or by imitating experts. It is also an assertion that such elements should not be regarded as opportunities to implement pre-specified classroom routines or even to apply pedagogical theories learned elsewhere. For beginning teachers working within an established community of practice, with access to the practical wisdom of experts, 'clinical practice' allows them to engage in a process of enquiry: seeking to interpret and make sense of the specific needs of particular students, to formulate and implement particular pedagogical actions and to evaluate the outcomes. While teaching clearly requires mastery of many 'practical' skills, the fundamental importance of 'client' relationships and of 'judgment in action' calls not only for opportunities to rehearse and refine such skills, but also for the chance to engage in the creative processes of interpretation, intervention and evaluation, drawing on diverse sources of knowledge that include research evidence as well as student data.

So what is meant by 'research-informed clinical practice'?
 Recent discussions of 'clinical practice' in education, such as Kriewaldt and Turnidge's (2013) elaboration of the role of 'clinical reasoning', essentially already convey the necessity of bringing research-based understandings of teaching and learning into dialogue with the professional understandings of experienced classroom teachers. Although the precise terminology varies, the scope for inclusion within this review is specifically defined by the intention of ITE programmes

- (a) to facilitate and deepen the interplay between the different kinds of knowledge generated and validated within the different contexts of school and university; and
- (b) to provide scope for the beginning teacher to interrogate each in light of the other, bringing them both to bear in interpreting and responding to their classroom experiences.

Although ITE in many countries has taken a 'practicum turn' (Mattsson et al 2011), with greater emphasis on classroom 'field experiences' rather than university-based study, neither a simple increase in the former nor even claims to be operating 'partnership' models are sufficient in themselves to warrant inclusion. Increasing novices' time in school may well imply rejection of research-based knowledge, rather than concerns to integrate such knowledge more effectively with that developed in schools. Moreover, the introduction of many so-called 'partnerships' has often brought little change to conceptions of the nature of professional learning, merely preserving the dominance of one perspective or the other and failing to address potential disjunctions between them (Furlong et al 2000).

WHERE HAVE APPROACHES BASED ON THIS PRINCIPLE BEEN ADOPTED?

The Oxford Internship Scheme

Within the UK, one of the earliest models of such an integrated programme, and the only one identified by the Modes of Teacher Education Research team (Furlong et al, 2000) as a genuinely 'collaborative' rather than 'complementary' partnership, was the Oxford Internship Scheme³ (Benton, 1990) developed in the mid-1980s. Its claims to being 'research-informed' relate in part to the extensive analysis of the limitations of existing approaches to ITE and studies of the nature of teachers' knowledge that shaped its founding principles (McIntyre, 1980, 1988; Benton, 1990), and to the on-going research that continued to influence its development (Hagger et al, 1993; McIntyre, 1997; Burn, 2006; Hagger and McIntyre, 2006). Many of the principles were concerned with the effective integration of the distinctive contributions of the school and university. They are summarised below (and cited in full in Appendix 1) precisely because they illustrate ideas and concerns that consistently recur within ITE schemes committed to bringing research-informed perspectives to bear in clinical practice:

- Partnership expressed in joint planning of the programme.
- A single coherent programme, with explicit relationships and short time intervals between connected elements in the different contexts.
- Carefully graduated learning tasks intended to permit rational analysis.

² Kriewaldt and Turnidge cite a number of sources in support of this definition of clinical reasoning: Higgs 2008; Levett-Jones et al 2010; Pelaccia et al 2011.

³ The title of the programme, and the designation of student-teachers as 'interns', reflect a very deliberate alignment with models of clinical practice in medical education.

- Explicit encouragement for interns to use ideas from diverse sources.
- Explicit assertion by both partners that consensus is not expected.
- Emphasis on testing all ideas against the different criteria valued in each context. (McIntyre, 1990: 32-33).

To achieve this kind of integration, the two elements of the programme ran in parallel, with interns dividing each week between school and university for several months, before undertaking more sustained periods of clinical practice, still interwoven with occasional weeks in the university. The insistence on testing ideas from all sources and explicit acknowledgement that consensus was not be expected emphatically highlighted the rejection of a 'theory-into-practice' model which assumed neat continuities between decontextualized research-based claims about 'what works' and their implementation in highly diverse, individual contexts. It was intended to promote the kind of processes later defined by Kriewaldt and Turnidge (2013) as 'clinical reasoning', and which McIntyre (1993) elaborated as 'practical theorising'. The architects of Internship never doubted the value of research-based claims about the nature of learning and those pedagogical strategies shown to be most effective in bringing it about. Indeed, they expected such claims to be framed as specific 'suggestions for practice' (Hagger and McIntyre, 2000). But their research-based understandings of teachers' professional knowledge and of the nature of professional learning led them to present teaching as a process of hypothesis-testing, requiring interpretation and judgment in action, rather than the routinised application of learned repertoires. Appreciation of this complexity underpinned their insistence on a carefully-staged introduction to the tasks of teaching, intended to promote systematic evaluation from the very beginning.

Such an enquiry stance has recently been deliberately promoted in collaborative schemes elsewhere within the UK, notably in the Scottish Teachers for a New Era (STNE) programme (Livingston and Shiach, 2010) and in the Glasgow West Teacher Education Initiative (Conroy et al, 2013). The architects of the former explicitly acknowledge the distinctive kinds of knowledge to be explored in different settings and link the process of collaborative enquiry – in which all parties are engaged – with social-constructivist conceptions of learning including those of Vygotsky (1978) and Bruner (1986). Since the dominant influences on the latter derive largely from American initiatives (see, for example, references by Conroy et al, 2013 to Darling-Hammond, 2006; and Cochran-Smith, 2009), the second context on which this paper focuses is the United States, looking

at Professional Development Schools (PDS) and the subsequent Carnegie-funded Teachers for a New Era (TNE) programme.

Professional Development Schools

In the United States significant reforms from the mid-1980s onwards, particularly those associated with the Holmes Group (1986), led to the development of PDS, (or 'clinical schools').⁴ These schools, intended to 'connect teacher education reform with school reform' (Zeichner, 2009: 26), were to 'serve as a setting for clinical internships of pre-service teachers and for in-service professional development of practising teachers' (Hallinan and Khmelkov, 2001: 180). Drawing on the teaching hospital model, in which the 'results of research feed directly back to patient care and student preparation' (Case et al, 1986: 40), they were developed as sites where 'practice-based and practice-sensitive research can be carried out collaboratively by teachers, teacher educators, and researchers' (Darling-Hammond, 2006:162). Key elements of successful PDS programmes were identified as: coherence between coursework and clinical aspects; a strong core curriculum; extensive connected clinical experiences; an enquiry approach; school-university partnerships; assessment based on professional standards, and 'in all cases at least 30 weeks of mentored clinical practice under the direct supervision of one or more expert veteran teachers' (2006:153).

However, the PDS programme differed significantly from the Oxford Internship Scheme in its focus on preparing teachers for work in urban schools with students from diverse backgrounds.⁵ Rather than operate in partnership with schools essentially as they were, PDS schools were intended to become sites for research (by all parties) into specific strategies and effective ways of teaching those for whom prevailing educational policies were not currently working – mainly pupils of minority ethnic backgrounds attending large urban schools in areas of high socio-economic deprivation (Zeichner, 2009).

Teachers for a New Era (TNE)

Similar concerns underpinned the development of 'clinical practice' within the TNE initiative which also drew on research evidence in its programme design (and sought closer collaboration between education and other subject faculties within the universities) (Carnegie Corporation, 2001).⁶ Since most ITE programmes already included some form of extended 'field experience' the emphasis was on achieving coherence: 'the alignment of key ideas and goals across coursework and clinical work' (Hammerness, 2006: 1244).

More recently the National Council for Accreditation of Teacher Education (NCATE) has sought to promote

⁴ See Teitel, 1998, for a literature review of early PDS developments.

⁵ The Oxford Internship Scheme was developed in a single English county with comparatively few city schools, and little ethnic diversity – at the time – among most of its school populations.

⁶ Through the TNE initiative, \$5 million was invested in each of eleven institutions over a period of five years.

a national strategy for the clinical preparation of teachers. In an attempt to turn 'the education of teachers 'upside down' (NCATE, 2010: 2), a report from its Blue Ribbon panel presents ten design principles for the clinical preparation of teachers and a suggested implementation strategy, proposing changes to the ITE curriculum and to staff roles in order to strengthen partnership and secure a stronger research base.

The Melbourne Master of Teaching

These developments in the USA served as an important model for the two-year Master of Teaching (MTeach) recently developed by the University of Melbourne.⁷ Most studies of clinical practice in Australia focus on this programme (see, for example, Ure, 2010; McLean Davies et al, 2013) and its underlying rationale can be summarised as follows:

It is founded on a clinical practice model in which pre-service teachers are immersed into classrooms in partner schools from the first few weeks of semester where they are supported by a network of school experts ('teaching fellows') and university-based experts ('clinical specialists') who make connections between school field experiences and academic coursework. Together the interlaced responsibilities of staff and the integrated design of the program result in the development of the skills of clinical reasoning in graduates. (Kriewaldt and Turnidge, 2013: 104)

Clinical reasoning is presented as 'a type of logical thinking and discourse in which case specific evidence is evaluated' and in which 'different types of knowledge are integrated and applied'; it 'makes tacit or intuitive knowledge visible in order for it to be shared, developed and analysed' and within such an approach the 'mentor teacher, as more expert, must model and articulate their reasoning to enable the novice-teacher to deepen understanding and to synthesise both practical and theoretical knowledge' (2013: 107). By viewing practice from an inquiring stance, and engaging in collaborative planning and 'collegial critical reflection' beginning teachers are expected to learn to evaluate and incorporate research evidence into practice, along with that of pupil assessment data. A Clinical Praxis Exam, which 'asks candidates and those supporting them, to consider theory and research in the context of practice' (McLean Davies et al, 2013: 99), bears some resemblance to the 'capstone projects' identified as a feature of many exemplary programmes in the USA (Darling-Hammond, 2010).

Realistic or authentic teacher education in the Netherlands

A similar but essentially separate impetus towards more integrated ITE programmes is evident in the Netherlands. A drive towards 'realistic' or 'authentic' teacher education (Korthagen et al, 2001; Terwindt and Wielenga, 2000) sought to combat problems of 'reality shock' (Veenman, 1984; Britzman, 1986), as beginning teachers discovered that theoretical insights developed in university-based sessions had not adequately prepared them for classroom realities. Although there is no universal 'Dutch approach to teacher education', teacher educators tend to work 'within a common framework and a shared vision of teaching and learning' (Hammerness et al, 2012:52). That this vision is elaborated with reference to an extensive meta-analysis of research into effective learning (Bransford et al, 2000), indicates the fundamental importance of research perspectives within ITE programmes for all stages of education.⁸

The 'realistic approach to teacher education' at Utrecht University is built on a long tradition of research (Koestier and Wubbels, 1995; Korthagen et al, 2001; Tigchelaar and Korthagen, 2004) intended to help novices to bring relevant theory to bear upon the particular concerns they experience as they begin to practise. Indeed the university deliberately incorporates aspects of 'reality shock' into the ITE programme, precisely so that beginning teachers recognise the need, and are equipped, to interrogate and trial the theoretical insights offered by the university while they still have access to them (Koestier and Wubbels, 1995; Stokking et al, 2003). The process of integration works both ways. At Leiden, beginning teachers are prompted to articulate insights from their classroom successes as rules of thumb, and then to examine and compare them with theories encountered at the university, gradually validating and extending their repertoire of such rules (Janssen et al, 2008). At the Amsterdam School of Education, each facet of the teacher's role begins with an introduction to relevant theory, intended to provide a frame of reference and a language with which to think and talk about classroom experiences.⁹ These lectures include both video-clips of teachers' work and research findings about the relationship between the variables under discussion (particular pedagogical approaches or behavioural strategies) and the desired outcomes, in terms of student cognition or motivation. Role-plays within the university are followed by teaching and research tasks in school which are video-taped for analysis along with feedback from the students in the class. Such tight integration requires the two elements to run in parallel, with each week split between school and university and a gradual

⁷ As noted above, they have also influenced recent collaborative approaches in Scotland.

⁸ There is a distinction in the Netherlands between research universities (such as those in Utrecht and Leiden) that are involved in teacher education for higher level secondary and pre-university teaching, and universities for the applied sciences (such as the Amsterdam School of Education) involved in preparing teachers for primary, lower secondary and vocational education.

⁹ The order in which those different facets are introduced is also 'research-informed' in that it is determined by research into which aspects of teaching student teachers regard as their most serious challenges (Evertson and Weinstein, 2006; Le Page et al. 2005)

increase in the time spent and responsibilities assumed in school. The principles guiding progression thus almost directly echo those developed at Oxford: internships from the very start allowing beginning teachers to relate university-based content to the realities of the teaching profession; a gradual increase in complexity and responsibility; and sustaining close links to the university within the final phase when they assume the role of full-time teacher (Hammerness et al, 2012:15).

Just as early American initiatives depended on establishing PDS committed to professional learning, so clinical practice is undertaken in special 'opleidingscholen' (training schools) with additional resources for coaching teachers and a commitment to providing appropriately graduated learning opportunities.

Finland: an entire integrated system in which teachers are regarded as researchers

Specifically designated and appropriately staffed Teacher Training Schools (TTS) also feature within ITE in Finland. As in the PDS programmes, TTS staff also pursue research and development roles in collaboration with university departments. Although there have been no specific Finnish initiatives to achieve more effective integration of university- and school-based contributions and no increases in beginning teachers' time in school, the coherence of the entire education system and its emphasis on the research training and orientation of all prospective teachers, means that its approach is characterised by many key features of 'research-informed clinical practice'.

Sahlberg's (2012) description of Finnish as 'research-based', for example, is a claim that it must be supported by 'scientific knowledge' and be focused on 'thinking processes and cognitive skills employed in conducting research' (Jakku-Sihvonen and Niemi, 2006). He particularly alludes to the 'systemic integration of scientific educational knowledge, didactics and practice in a manner that enables teachers to enhance their pedagogical thinking, evidence-based decision making and engagement in the scientific community of educators' (2012: 6). All prospective teachers are encouraged to view teaching as a process of practical problem-solving, informed by a range of different insights, and are required to achieve a full Master's degree, demonstrating knowledge and understanding of the 'advanced fields of educational science' and the 'interdisciplinary nature of educational practice' and their own capacity to 'design, conduct and present original research on practical or theoretical aspects of education' (2012:11). Equipping teachers with the skills necessary to conduct their own research enables them not only to adopt a research-orientation towards their own practice, but also to evaluate the findings of others' research, discerning its value in interpreting and responding to the particular classroom situations that they face.

Although the ITE curriculum is carefully planned with progression built into successive periods of classroom experience, these account for only about a third of the ITE programme. Sahlberg acknowledges that graduates may not necessarily have acquired experience of participating in a 'community of educators, taking full responsibility for a classroom or students, or interacting with parents'. It is therefore to the overall cohesiveness of the system that most outside observers and internal evaluators attribute the programme's success (Darling-Hammond, 2006; Jussila and Saari, 2000; Saari and Frimodig, 2009).

WHAT RATIONALES HAVE BEEN DEPLOYED TO EXPLAIN THE ADOPTION OF SUCH APPROACHES?

Although the 'practicum turn' in ITE has often been inspired by concerns to reduce or eliminate the role of universities which are blamed for actual or perceived problems with the quality of graduating teachers (Grimmett, 2009), the integrated programmes described in this paper have essentially been initiated by university-based advocates who have been very open about their own sector's failings. Examples include Darling-Hammond's condemnation of uninspired teaching methods, superficial curricula, and traditional views of schooling' (2006: 279) and Hagger and McIntyre's (2000) insistence that universities must make research-based findings more accessible, offering them not as theoretical propositions but in the form of suggestions for practice.

The range of ideas that has inspired 'research-based clinical practice' initiatives can be summarised in the following principles:

1. Acknowledgement of both the profound value and the inevitable limitations of decontextualised research-based understandings of practice for beginning teachers;
2. Appreciation of the rich seams of knowledge, understanding and skill to which beginners could potentially gain access in the practice of experienced teachers;
3. Understanding of the complexity and context-specific nature of experienced teachers' knowledge and of the processes by which it is developed within particular communities of practice;
4. Explicit recognition of the fundamental importance of experience within teachers' learning, and of their need to test all ideas offered to them;
5. Awareness of the poor conditions for professional learning that tend to prevail in schools where ITE is only a marginal concern;
6. Concern about equipping teachers to work effectively in educational contexts very different from those with which they have been familiar; and
7. Ambition to produce teachers committed to life-long learning and capable of generating the new

professional knowledge that they will need to adapt to the different contexts and changing demands of the educational system.¹⁰

McIntyre (1990) grouped the concerns that inspired the development of the Oxford Internship Scheme into two categories: one concerned with problems of continuity between university and school (or between 'theory and practice'); the other related to poor conditions for pre-service teachers' learning in school. The latter are encapsulated in Zeichner's (2010) complaint about the obstacles to learning associated with the traditional loosely-planned and monitored model of 'field experiences'. According to McIntyre (1990) many problems of both sorts could be solved by organisational change. Locating large numbers of novices within partnership schools for an extended period of time would prompt school-based teacher educators to invest more time in provision for them. A carefully sequenced, jointly planned programme would facilitate gradual introduction to the complexities of teaching and make it possible to address the same issue from different perspectives within the same week. Public acknowledgement of the largely tacit, but immensely rich, sources of knowledge embedded in the practice of experienced teachers (Brown and McIntyre, 1992; Swennen and Klink, 2009) would further enhance their contribution, particularly if beginners were encouraged to plan and teach collaboratively with them (Burn, 1997) and were equipped with discussion protocols to elicit the thinking that underpinned expert pedagogical decisions (Hagger, 1997).

Yet McIntyre (1990) also argued that certain problems of discontinuity were rooted in inappropriate conceptions of professional learning and would inevitably persist if it was assumed that research-based ideas could simply be applied by beginners to the specific contexts of their placement schools. Any assumption of straightforward continuity ignored the inevitable differences between decontextualised claims about effective teaching (advanced perhaps because of their theoretical coherence, research warrant or long-term implications and underlying values), and the requirements of a particular context, in which teachers would inevitably advise beginners to attend to practical criteria (such as the constraints of time and resources, and of their existing expertise and the prevailing norms and assumptions within that school or department). Rather than suppressing one source or the other, the Oxford Internship Scheme sought to promote more rational testing of all ideas (including those that the interns brought with them), thereby encouraging precisely the kind of dialogue envisaged in Kriewaldt and Turnidge's (2013) promotion of 'clinical reasoning'.

The first four of the principles listed above can therefore also be seen as underpinning the crucial role of dialogue within the Melbourne MTeach programme. Highly supervised practical experiences are expected to involve probing conversations, not merely challenging what beginning teachers did or planned to do, but also exposing for discussion the reasoning and underlying assumptions of the experienced teacher with whom they are conversing. This is intended to promote 'a type of logical discourse in which specific case evidence is evaluated, different types of knowledge are integrated and applied, and reflection on processes and decisions is used to articulate the multiple possibilities that might be used to achieve the desired goal'. (Kriewaldt and Turnidge, 2013: 106; Benner et al, 2008). While expert teachers engage intuitively in this process, such structured dialogues make their clinical reasoning explicit, enabling novices to learn from the patterns, similarities and salient features that the experts perceive in specific situations (Swennen and Klink, 2009) and to appreciate the kind of judgment in action ultimately expected of them. The emphasis on structured dialogue in which diverse sources of knowledge (including research evidence and specific student data) are explicitly considered also guards against the risks inherent in notions of reflective practice that easily default to little more than lay thinking (Furlong et al, 2000: 463; Ure, 2010).

WHAT CLAIMS HAVE BEEN MADE ABOUT THE VALUE OF SUCH APPROACHES AND WHAT EVIDENCE IS ADVANCED IN SUPPORT OF THEM?

With the notable exceptions of Finland, which is consistently praised for the coherence and systematic structure of its teacher education (despite strong decentralizing tendencies) and the Netherlands, also noted for its 'shared vision of teaching and learning' (Hammerness et al, 2012), the initiatives discussed here are either single programmes (the Oxford Internship Scheme and the Melbourne MTeach) or relatively unusual experimental projects (such as the Stanford Teacher Education Programme), making little impact on the vast majority of ITE programmes.

Although the apparent effectiveness of the Finnish model (as measured by student outcomes within international tests such as PISA) has directed attention to its teacher education systems (Silander and Välijärvi, 2013), the causal connections are implied rather than directly proven.¹¹ In the Netherlands, tightly focused longitudinal studies within their 'realistic' ITE programmes have generated evidence about the effectiveness of specific features in supporting new teachers' conceptual development and classroom competence. Particularly

¹⁰ The first five of these principles were explicitly promoted in the rationale that underpinned the Oxford Internship Scheme (McIntyre, 1990.) The sixth is perhaps most strongly closely identified with the development of PDS in the United States (Zeichner, 2009) and is notably absent from Internship Scheme. The seventh can perhaps be seen as likely to be achieved if the first five are followed, but it clearly underpins the Finnish model of a Master's level research component in the education of all teachers.

¹¹ Indeed the Finnish Ministry for Education (2007) has called for research on teacher education to be strengthened through a better, more highly co-ordinated national research programme.

influential were the alternation of student teaching and college coursework, the close cooperation of school- and university-based teacher educators and the careful graduation in the complexity of teaching demands (Brouwer and Korthagen, 2005).

Its commitment to drawing on research-based understandings of teachers' professional learning means that the Oxford Internship Scheme has been intensively researched by its university tutors and school-based teacher educators. While this research has ranged quite widely – examining the effectiveness of particular mentoring strategies intended to make experienced teachers' tacit knowledge accessible for beginners (Burn, 1997; Hagger, 1997); the operation of the partnership in developing shared curriculum programmes and facilitating genuinely open discussion of disputed perspectives (Davies, 1997; Burn, 2006; Ellis, 2008); the nature of interns' progression over the course of the year (Jubeh, 1997); and the views of school students and their teachers about the impact of the interns' work in school (Carney and Hagger, 1996) – there has been no systematic, quantitative study of the programme's impact on student learning outcomes. Thus, while it is possible to conclude that 'both pupils and mentors saw the involvement of interns in their classroom in an extremely positive light' (Carney and Hagger, 1996: 190), no claims can be advanced on the basis of data related to students' achievement or progress. Moreover, intense scrutiny has essentially revealed the fundamental variability of interns' experiences, even within a single small-scale, collaboratively planned programme (Carney and Hagger, 1996; Jubeh, 1997; Burn, 2006).

While the recently initiated Melbourne MTeach has yet to generate significant claims about its impact, the American research that informed its development allows some large-scale, but relatively limited conclusions to be drawn. Wilson et al (2002) note that 'the research on clinical experiences is weak' (p.196) and that its focus has too often been on perceptions of the learning process. However, the evidence that has been assembled can be summarised in the following claims:

1. Clinical experience has a positive effect on beginning teachers' learning since they are better able to integrate theoretical and practical knowledge, resulting in greater confidence in that learning (Hammerness et al, 2005)
2. While research into the relationship between ITE and pupil outcomes is both limited and problematic (Cochran-Smith and Zeichner, 2005; Kirby et al, 2006), there is some evidence that clinical preparation is a factor in determining teacher effectiveness (Boyd et al, 2008; Darling-Hammond et al, 2002).
3. Graduates of programmes with a greater emphasis on clinical practice are better prepared for their

first teaching post (Clift and Brady, 2005), but it is the quality of the clinical experience that matters. While an overall lack of school-based practice has a negative effect on pupil outcomes (Boyd et al, 2008), more time in schools does not necessarily lead to better outcomes (Grossman, 2010).

4. Graduates of programmes with an extended practicum experience in which school-based practice is 'interlaced' with university coursework have 'increased confidence, are more effective teachers and are increasingly committed to teaching as a long-term career' (Darling-Hammond and Bransford, 2005: 411).

In calling for further research, particularly into student outcomes, the inherent challenges must be clearly acknowledged. Not only are causal relationships notoriously difficult to establish, but the inevitable variety between schools makes claims difficult to assert even at programme level, while the range of programmes within particular contexts makes system-wide claims more complex still.

CONCLUSIONS

Evidence from those contexts in which it has been developed most systematically suggests that research-informed clinical practice makes a very important contribution to school and system improvement. Although in Finland the connection between high pupil outcomes and the 'systematic integration of scientific knowledge...and practice' within ITE (Sahlberg 2012:6) can only be inferred, the research orientation required of all qualified teachers equips them to continue developing their practice in response to new challenges. They are able to evaluate for their own use the findings of wider academic research and to engage in well-informed, focused classroom experimentation in which student outcomes are carefully analysed.

Within the Netherlands, systematic analysis of the operation and outcomes of 'realistic' ITE programmes has confirmed some causal relationships. Particular programme features – the tight integration and careful graduation of tasks – have been shown to contribute to the development of specific teaching competences associated with stimulating students' active engagement in their learning (Brouwer and Korthagen, 2005). This study provides a model of rigorous research within complex and potentially variable programmes dependent on the quality of individual school/university relationships. Its longitudinal, multi-method design discriminates between the programme as intended, as implemented and as experienced and between immediate and longer-term impacts. Its careful design acts as a caution against accepting simplistic claims about short-term impact, based on narrowly-defined outcomes. It illustrates the kind of large-scale research programmes required to establish robust claims about the effectiveness of complex courses.

While there is good evidence from different contexts about the value of 'clinical practice', its impact is determined by the interplay between different components. This highlights a need for secure partnerships, committed not only to making distinctive kinds of expertise and learning opportunities available, but also to co-operating sufficiently closely to ensure their genuine integration. Such collaboration may be difficult to secure within policy contexts in which there is little stability and no long-term planning for the allocation of prospective teachers to particular ITE providers.

In reviewing the potential contribution of research-informed clinical practice to school and system improvement, it is also important to acknowledge its impact on the experienced practitioners engaged within it. Detailed evaluations of experimental programmes such as the Oxford Internship Scheme consistently point to the perceived benefits for mentors who are prompted by their role to engage critically with the research-informed perspectives that beginning teachers are evaluating in their practice.

While our focus has been on the contribution of research-informed critical practice through initial teacher education, the striking parallels between its effective features and those of successful CPD programmes are useful in seeking to improve the links between research, policy and practice across all phases of teacher education. Those CPD programmes that adopt a research-informed, enquiry-oriented approach are rated most highly by teachers themselves (Davidson and Jensen, 2009), while the same elements – teachers' use of large-scale research findings and their conduct of small-scale, collaborative enquiries – also feature prominently among the characteristics of provision that secure the greatest impact on student outcomes (Cordingley et al, 2007; Timperley et al, 2007). Specialist expertise – including knowledge of research evidence – remains essential, but must be combined with long-term, focused support within the school in ways that promote teachers' agency and sustain commitment to practitioner enquiry, encouraging risk-taking and the rigorous evaluation of outcomes.



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APPENDIX 1: EXTRACT FROM THE LIST OF KEY PRINCIPLES THAT INFORMED THE DEVELOPMENT OF THE OXFORD INTERNSHIP SCHEME, AS ELABORATED BY MCINTYRE (1980)*

3. Partnership between university and school staff in joint planning of the programme with agreement on issues to be dealt with, their ordering, and the respective tasks to be undertaken by staff and interns in school and university.
4. Integration of the programme, so that there are clear, explicit relationships, and relatively short time intervals connecting university classes, workshops, reading and assignments with school observations, discussions, teaching and other tasks. In effect there is one coherent programme, with closely interconnected elements in school and university.
5. Secure learning environments, with learning tasks (especially those of teaching in school) being carefully graduated in a flexible way so that interns are not overwhelmed by the complexity or other anxiety-provoking characteristics of the tasks, but can instead approach them in calm, rational, analytic ways.
6. Explicit encouragement for interns to use ideas from diverse sources (in recognition that privately they will do so in any case) including their own personal histories as well as university and school sources to inform their thinking and their teaching.
7. Explicit assertion by both university and school staff that consensus is not expected, either between university and school, or between interns and staff, about many aspects of good practice or about useful ways of thinking.
8. Emphasis on testing all ideas against various criteria, including 'academic' criteria of theoretical coherence, consistency with research evidence, consistency with espoused educational and social values, and 'practical' criteria of feasibility in relation to constraints of time, resources and expertise, acceptability to relevant others and effectiveness in context. (McIntyre, 1990: 32-33).

* The numbers reflect those used in the original list since these principles are only an extract from the full set.

This paper has been commissioned as part of a major Inquiry undertaken by BERA and the RSA on the role of research and teacher education. The Inquiry aims to shape debate, inform policy and influence practice by investigating the contribution of research in teacher education and examining the potential benefits of research-based skills and knowledge for improving school performance and student outcomes.

To investigate the contribution that research can make to teacher education, seven academic papers have been commissioned from experts in the relevant fields: international and UK policy and practice on teacher education; philosophical reflections on the nature of teachers' professional learning; innovative programmes of initial teacher education based on the model of research-informed 'clinical practice'; the role of research in effective continuing professional development (CPD); the impact of research-based teaching on school improvement and student outcomes; and research engagement from the teacher's perspective.

Further information on the Inquiry and its other outputs can be found via the BERA website: www.bera.ac.uk