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Building teachers' research literacy: Integrating practice and research

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Building Teachers' Research Literacy: Integrating practice and research.

Supporting early career teacher (ECT) research literacy is essential in promoting research-integrated professional practice, however it remains an area in much need of development. This article discusses the importance and process of developing ECTs' research literacy, through establishing strong collaborative links between universities and practising teachers in schools. It is located within an English policy and educational context in which the role of higher education and schools in teacher education has been substantially altered in recent times. Two programmes, the *NQT and Beyond* and *Developing Resilience in Learning and Teaching*, are used to illustrate how ECTs can actively engage in and with research as they enter the teaching profession, and thus develop their research literacy. The design principles of these projects are used to demonstrate the potential of how a research-informed pedagogical framework based on the Personal Learning Styles Pedagogy, aspects of self-regulation and resilience, can facilitate research-informed learning and teaching.

In supporting ECTs' research literacy, universities, in collaboration with schools, play an important role in supporting the sustainability of research and in enabling teachers to connect their own practice with the broader body of research knowledge. Teacher and pupil ownership of research is crucial in developing research-integrated learning.

Keywords: early career teacher; research literacy; university; sustainability

Overview

This introductory article foregrounds discussions around the importance of developing early career teacher (ECT) research literacy followed by six articles by ECTs implementing research in their own contexts and two critiques of their work. A final article will review the impact of the two programmes in developing ECT research literacy, and the factors associated with this, drawing on the work of the ECTs featured in this special issue and the wider ECT cohort involved in the two projects.

The importance of integrating research into teaching

The critique and integration of appropriate research to inform and evolve effective teaching and learning practices is an essential requirement for teaching professionals in 21st century learning environments (Waring and Evans 2015). This should involve teachers engaging in, and with, research in order to be able to use research discerningly to inform their own practice and that of others (DfE, 2016a). Essentially, as part of this, teachers should also collaborate with their pupils to get them engaged in and with research. In doing so, pupils can develop their abilities and take ownership of the skills that allow them to critically engage with research evidence and help them to make informed decisions in evolving learning contexts on an ongoing basis.

High quality teaching has been identified as the most important school-level factor impacting pupil achievement (BERA/RSA 2014, 5). Exploring how research can be used most effectively to inform the development of teacher education programmes and to support the on-going professional learning of teachers in ways that will result in ‘high quality teaching’ is therefore important (Winch, Oancea, and Orchard. 2013). As part of this endeavour a better understanding of the relationship between educational research and teachers’ professional learning is required (Whitty, et al. 2012).

Creating the conditions for ‘authentic professional learning’ (Webster-Wright 2009) to take place, requires the willingness of teachers and researchers to work collaboratively, in designing and implementing professional learning activities that will result in teacher learning and potentially pupil learning gains. For this to take place, teachers need to be able to generate and evaluate appropriate evidence they collect from their everyday practice, and

at the same time, make sense of findings from appropriate educational research (Shank and Brown 2013), in order to inform, develop and translate ideas into practice in a way that is meaningful and manageable to themselves, their pupils, and colleagues. This can be referred to as ‘research literacy’, which involves the ability to judiciously use, apply and develop research as an integral part of one’s teaching. Research literacy involves the ability to draw on and integrate different kinds of evidence gained both intuitively and rationally dependent on:

...a willingness to engage with research in order to assess its utility and ripeness for adaptation to context. It is not about an unthinking acceptance of received opinion. It involves critical scrutiny of evidence, whether that be directly from enquiry-oriented practice evident in schools, from active participation in research, and/or from examination of researcher-led studies... (Waring and Evans 2015, 18)

It is important to acknowledge that research literacy should be seen as an essential component of what teachers do on a daily basis and not perceived as something externally driven and focused on specific discrete projects (Carter 2015).

Sophisticated understandings of professionalism require teachers to actively critique research evidence and to be able to creatively adapt research findings in order to implement effective teaching strategies nuanced to the requirements of a specific context. In doing so, research literate teachers become more able to justify the reasons for a specific approach through careful synthesis and evaluation of information on an iterative basis informed by practice, research knowledge and experience (Wilson et al. 2013).

Promoting a critical pedagogical stance as part of an inclusive pedagogy is essential in realising a “world-class education and care that allows every child and young person to reach

his or her potential, regardless of background” (DfE 2016b, 5). Supported by teachers’ research literacy a critical pedagogy requires teachers to consider who is advantaged and disadvantaged by their teaching practices and it is an essential consideration in reducing differential learning outcomes as part of providing a genuinely inclusive pedagogy for pupils (Waring and Evans 2015).

A symbiotic relationship: the authentic integration of research literacy into teaching

There are a number of interrelated factors which together contrive to influence the authentic integration of research literacy into teaching. Three key themes of policy, collaboration and professional development will be used to briefly frame these. It is important to recognise that these dimensions overlap and are not linear in their relationship, and relate in this instance to an English educational context. We will start with policy and explore how the changes to this in relation to education, particularly initial teacher education have moulded notions and expectations of collaboration and professional development as part of the teaching and learning landscape in schools and universities.

Policy

While the value of research in teacher education may have diminished over time in England (Beauchamp, Clarke, Hulme and Murray 2013; BERA/RSA 2014), there is a growing awareness that increasing research in schools is essential to enhance the quality of teaching (Cordingly 2013; NCSL 2012). This interest in research and associated research funding to schools has come at a time when the role of higher education in English teacher training has been significantly revised and reduced by government policy (DfE 2010, 2011a). Simply “Arm[ing teachers] with the most up-to-date research into how pupils learn” as highlighted in England by the Department for Education’s (2016b, 16) twelve strategic priorities will not enable research-informed practice nor will a narrowly conceived reductionist approach to

considering ‘what works’ in relation to the achievement of narrow learning outcomes. Going beyond being able to identify ‘what works’ using quantitative approaches includes the ability and willingness to explore qualitatively and systematically ‘*how* something works’ and also ‘*why* it does *not* work’ (Lillejord and Borte 2016, 552). Therefore, all teachers need to know, not only, how to use research evidence critically but also how to actively engage in research with their pupils as co-researchers as an integral part of their everyday teaching and learning practice; research literacy should not be seen as a separate entity but as a sustained and integral part of being a teacher professional (NCSL 2012).

There are a number of transitions in a teacher’s career and ‘bridging the gap’ between initial teacher education preparation and teachers’ career development in their first phases of teaching in schools is essential. Creating a variety of tracks to a higher level qualification for teachers wishing to conduct research is important (Winch et al. 2013). Preparing early career teachers (ECTs) to be able to engage in, and with, research in order to be able to use research discerningly to inform their own practice and that of others is also extremely important.

While the recent English government (DfE 2016a) guidelines on effective professional development highlight the important role of research, the extent to which teachers are aware of these and have the time to consider and plan research within their own practice is debateable.

Collaboration

Promoting research literacy within initial teacher education and professional development programmes needs to be considered carefully in collaboration with schools and those responsible for newly qualified teachers’ induction programmes and early career teachers. Fletcher and Luft (2011), in an exploratory, longitudinal study across three years involving five newly qualified secondary science teachers, found that by the end of their first year of

teaching, these teachers' beliefs about teaching shifted towards more traditional and didactic orientations compared to the beliefs they held and developed during their teacher preparation programme, which had encouraged ambitious teaching practices. When the school context at an institutional or organisational level, does not support the use of ambitious teaching practices, a tension develops between what teachers have previously experienced in their teacher preparation and the realities of their new school context. Fletcher and Luft (2011, 1144-1145) noted that 'teacher preparation programs need to find new and different ways to monitor and challenge teachers to move toward the formation of reform-based beliefs'. One such way is for teacher education programmes to place a focus on research literacy in collaboration with universities, experienced teachers, ECTs and schools. Developing school-HEI partnerships to promote the integration of teachers' experiential knowledge with research-based knowledge (e.g. clinical practice in education model) that train and support beginning teachers to adopt research-informed practices rather than accepting received opinion without critique is important (Burn and Mutton 2013).

However, if experienced teachers are to support new entrants into the profession, they need to be confident in their own ability to use, implement, and evaluate research in order to provide rich learning environments that provide appropriate support for new entrants to the profession, and that support them in the moment and throughout their teaching careers. A key question, therefore is how to build research literacy capacity within and across schools. Universities have a vital role in enhancing not only the research literacy of teachers within schools but also in supporting school improvement (Coe, Cordingly, Greany and Higgins 2015; Mincu 2013), however, they need to collaborate with schools on equal terms in order for school-university partnerships to be successful in developing research literate teacher professionals (Lillejord & Børte 2016).

Professional Development

Teacher preparation programmes based at universities can provide the resources and facilitate knowledge sharing, bridge theory and practice in collaboration with teacher researchers, schools and other stakeholders and support the mentoring and professional learning of teachers by developing reciprocal and collaborative and partnerships with schools and teachers (Lillejord and Børte 2016). Universities are powerful brokers in facilitating and supporting the process of teachers connecting their own practitioner-oriented research with the broader body of research knowledge (Brown, Rowley and Smith, 2015). However, what constitutes research and teacher research (Cochran-Smith and Lythe 1999) needs examination to ensure valuing of practice and research knowledge (Hargreaves et al. 2005). Even though the term teacher researcher is employed, this does not imply a dichotomous position; it is important to see research as an integral part of what teachers do, and associated with this, is the valuing of practitioner research.

Addressing negative teacher perceptions regarding the value of research as a source for improving their learning and teaching is an issue that requires attention in trying to develop sustainable research literacy practices (Pedder, 2013; Pedder, James and MacBeath et al. 2005). In supporting the development of the research literacy of a teacher, their perceptions of the utility of the research need to be addressed. Therefore, research needs to be accessible, tailored and focused on the requirements of a specific school context to support teacher development in schools so that teachers can see how research can be utilised for their own professional learning, and so they can become generators and not only receivers of research.

Why focus on ECTs?

As part of designing a research-integrated professional development pathway and enhancing partnerships between universities and schools, the building of networks of support to facilitate the transition of ECTs into schools was considered a key focus: ECT development

was seen as a main way of supporting professional development within schools with mentoring of new entrants to the profession seen as the responsibility of the whole school and not solely the preserve of named brokers (mentors) in order to promote a sustainable approach to the induction of ECTs and to support whole school professional development. The pathway was also seen as a vital way of building on ECT knowledge and skills from initial teacher preparation.

The programme design supporting early career teachers' research literacy

The two programmes designed to support ECT research literacy development were the *NQT (Newly Qualified Teachers) and Beyond* programme and a further development of this, the *Developing Resilience in Learning and Teaching* programme piloted in the TeachFirst Yorkshire and Humber region. TeachFirst (TF) operates in 11 regions in England. It comprises a two year intensive school-based leadership development programme. On successful completion TF students gain a Postgraduate Diploma in Education (PGDE), covering both education and leadership. Promotion of equal opportunities for all pupils is key to the vision of this independent organisation. A key issue is supporting TF ECTs was on how to manage their transition into the classroom with very limited experiences of teacher training.

The two examples (*NQT and Beyond* and *Developing Resilience in Learning and Teaching*) underpinned by the same theoretical framework highlight curriculum design considerations when preparing ECTs to undertake research as an integral part of their teaching practice and early career development in schools. The assessments in both programmes were firmly rooted in the ECT's practice and importantly, ECTs chose their focus with guided support from the researchers, peers, and colleagues in schools.

The *NQT and Beyond* programme was developed as a ‘bridging’ module for ECTs (teachers within their first five years of teaching) who having completed a one year post-graduate certificate in education (PGCE) or equivalent, could undertake the module concurrent with their employment in school and/or related areas of employment. The module comprised a blended learning format with three taught days supported by an online virtual learning environment using the resilience framework articulated in Figure 1 that considered the self, the self-in-context, and the development of a pedagogy promoting self-regulation.

The *Developing Resilience in Learning and Teaching* was designed to support TF ECTs’ entry into teaching and research-informed practice. The programme focused on the development of resilience as a way to support learning and teaching in schools and the teachers’ own development of 21st century learning dispositions including a will to learn; will to encounter strangeness; a will to engage; preparedness to listen; a willingness to be changed as a result of one’s learning; and a determination to keep going (Barnett 2007, 2011). The programme was taught over three days distributed evenly throughout the year to allow ECTs sufficient time to develop, implement, and evaluate their own research within schools. ECTs had access to core readings, a set of tools to explore their own practice, and an additional self-regulatory framework to analyse development of self, self-in-context and development of their resilience pedagogy building on the *NQT and Beyond* design where the Personal Learning Styles Pedagogy principles and framework (Evans and Waring 2009; Waring and Evans 2015) (discussed in the next section) had been mapped to resilience characteristics to include self-understanding and confidence, control, relational and cognitive dimensions. Regular contact via email with the HEI lecturer with support using rubrics to systematically and progressively explore development of the three constructs (self; self-in-context; pedagogy – resilience version, Evans, Appendix A, this issue) with mentors in schools were also important aspects of this programme.

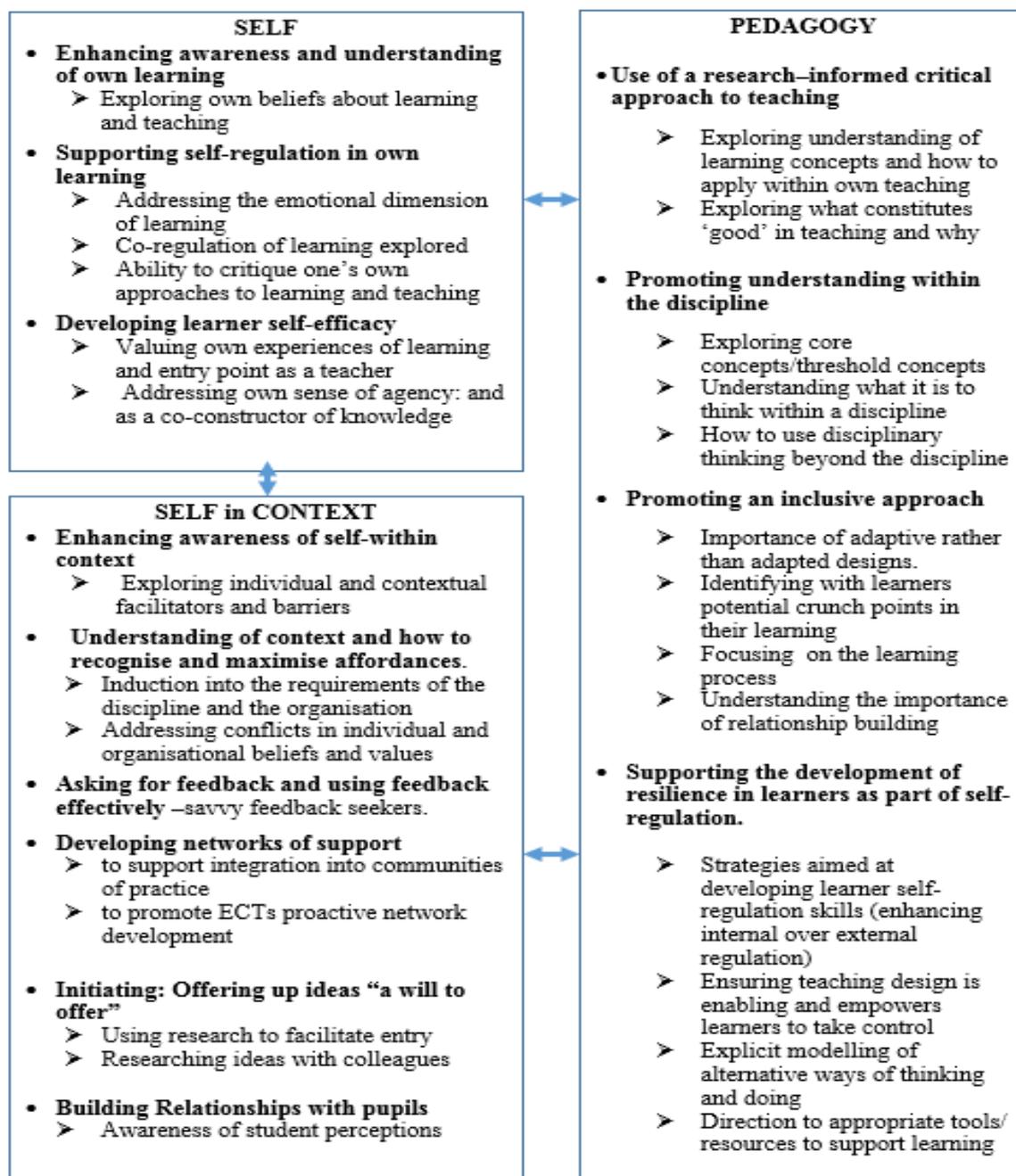


Figure 1. Resilience Evaluation Framework Core Areas (Evans, EAT, 2015)

The *Developing Resilience in Learning and Teaching* programme was ambitious in seeking to enhance ECTs' ability to: (i) critically reflect on their own practice; (ii) analyse and synthesise core learning concepts to inform understanding of learning and teaching; (iii) implement their own resilience pedagogy and evaluate the effectiveness of this in practice; (iv) articulate the principles underpinning their pedagogies; (v) enhance understanding of

working within the school context, (vi) build networks and contribute to professional practice within and across schools.

Both programmes were developed cognisant of ongoing debates regarding the role of higher education (HE) in teacher education and the reduction of pedagogical research in initial teacher education pathways in England. In contrast to other countries of the UK and in Europe, the role of HE in teacher education in England, has been reduced systematically over the last seven years as a direct consequence of government legislation and the consequent increasing diversification of teacher education pathways, and the reconceptualization of teaching as a craft rather than as an intellectual activity with an emphasis on the practical (DfE 2010, 2011a,b, 2016a; Brown et al. 2015; CEIR 2011; Grossman, Hammerness and McDonald 2009; Haggerty, Postlethwaite, Diment, and Ellins 2011; Haggerty and Postlethwaite 2012; Hobson et al. 2007; Tracey et al. 2008;; Korthagen 2010; Mutton, Burn, and Hagger 2010).

A key element of the two programmes was examining teachers' conceptions of learning and teaching (Tickle, 2000) along with considering school leaders' perceptions of the efficacy of induction processes (CEIR, 2011) in order to promote greater parity of experience for all ECTs. In considering what it is to be a 21st century teaching profession, a key intention of curriculum design was to explicitly explore with ECTs their beliefs and values of good pedagogical and professional practice. Addressing how individuals reconciled their own beliefs and values with those of the school they were working in was found to be a key threshold concept (Thompson, Windschitl and Braaten 2013).

Mindful of supporting ECT's transitions into schools (Scott et al. 2014), enhancing and building on ECT strengths and areas for development to avoid a deficit model approach, (narrowly conceived to focus on areas of newly qualified teacher weakness) (Haggerty and

Postlethwaite 2012), was seen as fundamental in the design of the two initiatives. An inclusive approach was adopted to ensure sufficient support and challenge for ECTs (Burn, Hagger, Mutton, and Everton 2003, 327) and to facilitate additional extension possibilities for those ready and able to take on additional challenges both within and beyond schools through supporting access to research networks and in encouraging ECTs to maximise affordances within and beyond school boundaries. It was hoped that the projects would promote ECT agency by enabling ECTs to take responsibility for their own development and ambitiously, also lead to ECTs working with teams on whole school improvement issues with the aim of enhancing their sense of self within their communities of practice (Wenger, McDermott and Synder 2002).

The project design process, in both instances, was mindful of encouraging constructive and progressive enquiry (Cooper and Stewart 2009) by investing in high leverage practices that specifically related to ECT needs as part of an entitlement core provision delivered by the HEI and school in partnership (Grossman et al. 2009). For example, teaching ECTs how to work with pupils to develop routines for working together, and in providing explicit opportunities for novice teachers to rehearse and enact discrete components of complex practice (Biggs 2001). The intention was to provide appropriate, authentic and aligned experiences for ECTs to ensure an understanding beyond more than 'how to teach', to an awareness of why we teach in specific ways to attend to the fact that early classroom experiences may tend to trigger gestalts in ECTs related to survival or classroom discipline (Korthagen 2010). Great emphasis was placed on the development and enhancement of classroom interpersonal skills and subject knowledge to support ECTs' understanding of the dynamics within the classroom and development of behaviour management expertise. Further recommendations included an emphasis on explicit and visible practice. For example, promoting a negotiated programme of classroom observation for ECTs and

scheduled sessions with their peers to unpack lesson planning and to plan ahead, to go beyond what is often seen as a deficit model of NQT support focused on mechanistic aspects of practice (Edwards and Protheroe, 2003) and to address concerns raised by Postlethwaite and Haggerty (2012, 273) in relation to how “to bring the tool of theoretical ideas into the classroom discourse for student teachers so that it begins to influence decision-making... in a more explicit way”.

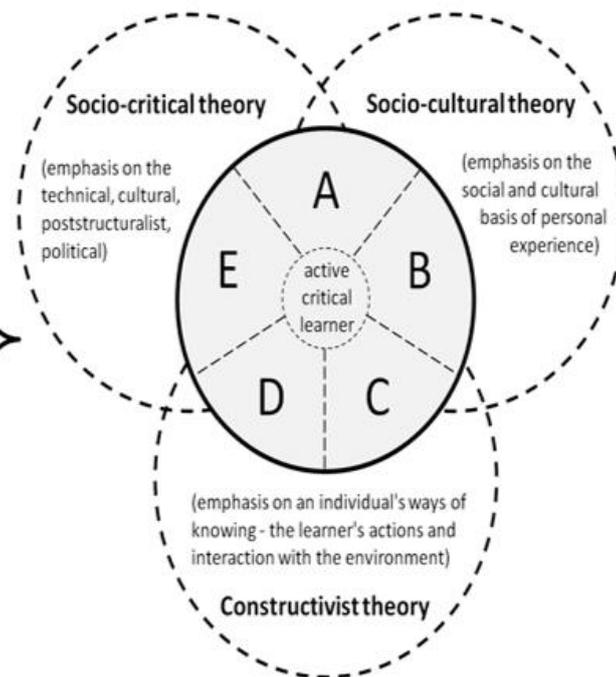
Conceptual and theoretical frameworks informing programme design

The overarching conceptual framework informing the *NQT and Beyond, and Developing Resilience in Learning and Teaching programmes* was the Personal Learning Styles Pedagogy (PLSP) (Evans and Waring 2009; Waring and Evans 2015) (see Figure 2). The PLSP with the ‘active and critical learner’ at its core comprises five inter-related components A-E and demonstrates an inclusive and participatory pedagogical approach informed by education, neuroscience and cognitive psychology research. The PLSP is underpinned by an integrated theoretical framework combining cognitive, socio-cultural, and socio-critical theoretical frameworks (Waring and Evans 2015) to ensure “...place both for the individual mind and for the larger social and cultural context that makes intellectual activity possible and meaningful” (Vosniadou 1996, 106).

Significantly, the PLSP is a self-regulatory framework emphasising the importance of cognitive, metacognitive, and affective dimensions of learning. The PLSP is informed by extensive systematic reviews of the individual differences literature including the detailed analysis of over 700 full academic articles from a total of 9073 articles (Evans & Waring 2012; Evans, 2013b) and evidence from sustained use in practice.

The Personal Learning Styles Pedagogy

- A Exploration of student & teacher beliefs/modelling and support**
(Importance of learners' previous knowledge, beliefs, learning histories, identity)
- B Careful selection and application of styles** (Emphasis on learning how to learn- development of metacognitive & self-regulatory skills and knowledge)
- C Optimising conditions for learning**
(Sensitivity to context - situational demands; promoting access; developing learner flexibility)
- D Design of learning environments**
(Using multiple representations of concepts and information; aligned and authentic assessment; explicit designs; network facilitation)
- E Supporting learner autonomy**
(Emphasis on developing student voice, negotiation and sharing of meanings; issues of power addressed)



Key principles underpinning the [PLSP] framework include: the importance of choice for learners; the centrality of the learner in the process; recognition of the unique starting points of learners; the importance of explicit guidance; the need for concrete and appropriate exemplars to contextualize learning events; the need for reinforcement and transference of ideas to new contexts; and opportunities to observe different ways of seeing and doing (Evans and Waring 2009, 181).

Applying the PLSP to the curriculum design

The ways in which the PLSP was used to frame the two programmes is highlighted in Table 1 which provides a more detailed outline of the PLSP framework to include sub-components. In supporting ECT research literacy emphasis was placed on the promotion of ECT agency using a self-regulatory approach and authentic curriculum design to support the transfer of research into practice.

Table 1. Components (and subcomponents) of a Personal Learning Styles Pedagogy applied to programme development (Evans 2015; Waring and Evans 2015)

	<i>NQT and Beyond</i>	<i>Developing Resilience in Learning and Teaching</i>
Context	<p>Developed at the University of Exeter for early career teachers (within first 5 years of teaching)</p> <p>Completion of the module and the related assessment was equivalent to 30 Masters credits</p>	<p>Developed at the University of Southampton and piloted in the TeachFirst Yorkshire and Humber region for TF ECTs.</p> <p>A stand-alone professional development programme. The research could be used towards Masters study.</p>
Components and Subcomponents of a Personal Learning Styles Pedagogy		
<p>A. Exploration of student and teacher beliefs/modelling and support</p> <p>(i) Focus on the learning histories of the learner (pupil and teacher).</p> <p>(ii) Consideration of whole experience of the learner.</p> <p>(iii) Exploration of learner beliefs about learning.</p> <p>(iv) Enhancing learner awareness and application of styles. Understanding of individual differences central to the design of learning environments.</p>	<p>Emphasis placed on unpacking ECT's beliefs and values and encouragement to use with pupils in schools</p>	
	<p>Emphasis placed on understanding and development of self-regulatory skills through explicit use of psychometric tools to enable self-assessment as 'research in action'</p> <p>Extensive exploration of cognitive style constructs to include cognitive styles analysis; cognitive styles index; deep approaches to learning; self-regulation models. Critique of the styles field and relevant applications to practice integrating education, cognitive psychology and neuroscience perspectives (Evans and Waring, 2009, 2012; Waring and Evans, 2015).</p>	<p>Emphasis placed on the understanding and development of resilience attributes through the use of resilience tools and frameworks.</p> <p>Extensive exploration of the multidimensional nature of resilience (e.g., style/strategy flexibility (Evans & Kozhevnikov 2011; Kozhevnikov et al. 2014); consistency of interest and perseverance 'grit' (Duckworth et al. 2007); network development (Evans 2014); emotional resilience (Abiola and Udofia 2011); self-perception (Hong 2010); self-assessment (Evans 2013a); savvy feedback-seeking (Evans 2014); self-regulation including metacognitive, cognitive, and affective elements (Vermunt 1998).</p>
<p>B. Careful selection and application of styles</p> <p>(i) Judicious and informed use of styles models.</p> <p>(ii) Critical analysis of styles. Styles models used as</p>	<p>The role of cognitive styles as one element in impacting self-regulatory and resilience development along with other individual difference variables. Evaluation of the reliability and relevance of constructs to practice and how to apply in an informed way.</p>	

<p>metacognitive tools to support understanding of learning.</p> <p>(iii) Awareness of the interdependence of cognitive style and other individual learning differences.</p> <p>(iv) Enhancing cognitive styles as an integral element of culturally responsive pedagogies.</p>	<p>'Hands on' approach to exploring cognitive style measures in focusing on cognitive style myths and realities and how to use such understandings to ensure using appropriate teaching styles for the requirements of the task.</p>	<p>Cognitive style covered in relation to style fixidity and flexibility as a dimension of resilience and how to develop cognitive style flexibility.</p>
<p>C. Careful Optimizing conditions for learning / sensitivity to learner context</p> <p>(i) Recognition of learners' unique starting points. Addressing the emotional dimension of learning.</p> <p>(ii) Supporting students during important learning transitions.</p> <p>(iii) Care afforded to how the level of cognitive complexity is managed to support learner flexibility.</p> <p>(iv) Supporting learners' integration into communities of practice.</p> <p>(v) Consideration of learners' networks of support and identity development</p>	<p>Assessment focus was chosen by the ECT with guided support from mentors and university lecturers in relation to specific programme and individual contexts. Exploration of individual learning journeys.</p> <p>Individual project: Production of a portfolio that demonstrated critical reflection on an aspect of one's practice to inform one's own learning and teaching.</p> <p>Rubric to support the development of critical reflection portfolio and provision of range of critical reflection tools.</p> <p>Support from an allocated school mentor, peers, and university research team.</p>	<p>Group and individual project: Development of an accessible resilience pedagogy for schools. Development, implementation, and evaluation of the effectiveness of ECTs' own resilience pedagogies on pupils' learning.</p> <p>Framework provided to support resilience development and the enactment of a resilience pedagogy.</p> <p>Support from allocated mentors and mentors chosen by ECTS to support them with the project. Support also from peers, and university research team.</p>
<p>D. Design of learning environments</p> <p>(i) Housekeeping attended to (resource organization, availability, and information).</p> <p>(ii) Teaching methods attuned to the requirements of the content and context.</p> <p>(iii) Learners supported to think within a specific discipline.</p> <p>(iv) Judicious use of accommodation of cognitive styles and the concept of matching.</p> <p>(v) Promotion of the most appropriate cognitive styles for specific contexts.</p>	<p>Advance provision of all resources via VLE. Explicit guidance on the requirements of assessment and on-going target-setting</p> <p>Strong emphasis on the development of self-regulation and resilience. Focused feedback on development plans and support in refining ideas throughout the duration of the projects. Both programmes explored individual and contextual variables impacting learning and teaching but located firmly within specific ECT contexts.</p> <p>Pre-post session activities and rubrics to support the developmental journey of integrating and translating research into practice with strong focus on network development to support activities.</p>	<p>Advance provision of all resources via email. Explicit guidance on the requirements of assessment and on-going target-setting</p>

<ul style="list-style-type: none"> (vi) Teaching strategies aimed at stretching the learner through careful addition and removal of scaffolding. (vii) Designs focused on encouraging learners to adopt deeper and more self-regulated approaches to learning. (viii) Emphasis on enhancing awareness of different learning strategies through explicit guidance and exposure to diverse learning experiences. (ix) Authentic and appropriate assessment designs. (x) Appropriate use of technology to support learning. 	<p>The focus centred on exploring own approaches to evaluating practice and the importance of critical reflection and reflexivity.</p> <p>Key focus on developing cognitive, emotional, and metacognitive capacity.</p>	<p>The focus centred more explicitly on developing and implementing a resilience pedagogy along with discussion of tools to evaluate impact (Appendix A). Attention given to cognitive, emotional, and metacognitive dimensions with heightened emphasis on developing the relational dimension of learning as part of this and how to manage oneself-in-context as an extension of the NQT and Beyond approach.</p>
<p>E. Supporting learner autonomy: choices in Learning / student voice</p> <ul style="list-style-type: none"> (i) Focus on the centrality of the learner as a co-constructor of knowledge. (ii) Focus on the role of the learner in managing the learning process. (iii) Learner control afforded through design of curriculum. (iv) Flexible programme and assessment designs. (v) The importance of guided choice for learners. (vi) Informed and responsible use of groupings. 	<p>Assessments focused on what the ECTs wanted to explore to support their own learning and teaching. ECTs were given support in the choice of their assessment focus.</p> <p>Guided supported was provided through the use of teaching materials; tools to support self-evaluation and critical reflection including individualised development plans, and peer support opportunities.</p> <p>Environment was adaptive and not adapted – allowed ECTs to use resources as appropriate to their needs. ECTs were made aware of the range of networks available for support and encouraged to develop existing and new networks to support their learning and teaching to become savvy feedback seekers (Evans, 2014).</p> <p>Extended opportunities Masters study Journal writing – peer support and HEI on-going support with writing as part of iterative process.</p>	<p>Extended opportunities Masters study Conference presentations – joint delivery HEI and ECTs; resilience network development</p>

ECTs can be important brokers (Goswami, 2006) in supporting the translation of complex research into school contexts. A key aim of the programmes, through the vehicle of research-informed practice, was to give ECTs a greater sense of agency within their schools. ECTs were encouraged to be key partners in the learning experience (involvement in programme development, assessment, and evaluation). The aim was to empower them to be involved in whole school continuing professional development learning through developing a 'will to offer' (Barnett, 2011) using their research to negotiate entry as knowledge holders and producers into established communities of practice (Wenger et al. 2002) and not as peripheral participants. The development of an integrated framework (self, self-in-context and pedagogy) drawing on the individual differences and resilience research (Waring & Evans, 2015) was valuable in supporting ECT entry and development within schools. Development of pedagogy was very much dependent on addressing 'sense of self' and 'understanding of self-in-context'. The inquiry approach provided legitimacy to their work and the external support provided a 'critical friend' to advise on wider perspectives in order to enable ECTs to better situate their practice. The ECT as a researcher was a powerful vehicle in enabling ECTs to translate their understandings into practice with the support of both school-based and HEI mentors. Programme design features to include authenticity, transfer, self-regulation, detailed exploration and critique of core concepts were essential in supporting ECTs as researchers.

Authenticity was an important design feature supporting ECT agency and demonstrated in both programmes through a focus on the immediate needs of ECTs within their school contexts (Wilson et al. 2006). The ECTs chose their own research focus to enable them to concentrate on researching an area of practice of high importance to them. As part of authentic design, ECTs were given a range of opportunities to induct them into the HE academic community of practice (e.g., joint research; supported academic journal writing;

engagement in development of interventions, analysis and dissemination of findings at conference events within and beyond the programme). Examples of their work are showcased in this special issue.

The development of ECTs' self-regulation capacity was a strong underpinning dimension of the programmes with attention focused on the development of cognitive, affective and metacognitive dimensions of learning. Design elements included ECTs working as both research subjects (subject to ethical clearance from each of the universities involved with the two programmes) and research analysts as part of inducting ECTs into the research culture and to enable them to develop core research skills in order, for example, to be able to access and critique research articles using both qualitative and quantitative research methods of data collection and analysis, to critically exploring the potential and limitations of psychometric tools and measurement, to explore and evaluate different measures of impact (Carter 2015).

To support understanding and ability to apply ideas to context, detailed exploration of core concepts was undertaken. For example, resilience was examined as a layered/nested construct impacting all dimensions of life (life, workplace, immediate learning and teaching context). Both state and trait elements of resilience were considered in terms of the stability and fluidity of constructs (e.g., trait and state nature of emotions and emotional learning histories). Importantly, resilience was also considered as both an individual and collective construct (individual, department, organisation, school). Similarly, the state and trait nature of cognitive style was examined and the implications of how to use such findings in practice undertaken from an interdisciplinary perspective drawing on education, cognitive psychology, and neuroscience perspectives.

Emphasis was placed on how ECTs could replicate core concepts in practice especially in

relation to understanding learners' starting points. Exploring individuals' personal interpretative frameworks (Kelchtermans 2009) and how we each make sense of the world around us is essential in trying to understand our own personal theories of learning and what these are based on to help support informed pedagogical decisions. In exploring the effectiveness of ECT filtering processes we also need to be aware of the limitations of our own 'filter bubbles' (perceptions reinforced by our chosen filtering mechanisms (Elmes, 2017 referring to Boehm's work) created through the networks and communities that we are part of; highlighting the value of external partners in exploring different perspectives. To assist in this process emphasis was placed on the development of critically reflective and reflexive practice acknowledging that ECTs need to be supported in developing critical reflection capacity through the use of tools, modelling of ideas, exposure to different approaches, appropriate scaffolding and, importantly, the careful removal of scaffolding to support this process (Waring and Evans 2015). Exploring the concept of developmental space (Van der Zwet, et al. 2011) to consider facilitators and barriers to learning within a programme/context (contextual space) and from a personal perspective (socio-emotional space) was powerful in supporting ECT understanding of factors impacting their own and others' learning as was Butin's (2003) socio-critical framework in order to consider (i) technical aspects of an organisation or programme (organisation and effectiveness of a programme) (ii) cultural aspects (acknowledgement of individual differences/awareness of previous experiences); (iii) political aspects (issues of agency and involvement in communities of practice); and (iv) poststructural aspects (sense of identity / self-development / use of knowledge and ideas across contexts) as elements of practice.

Developing the 'researcher' in ECTs

In developing ECTs' research literacy attention needs to be placed on a number of key considerations to include: locating research within teachers' everyday practice and exploring with ECTs what knowledge is valued; supporting ECT agency through research literacy, and ensuring the sustainability of research.

Locating research within teachers' everyday practice: What and whom is shaping knowledge?

There are numerous views about what constitutes effective pedagogy and an increasing number of research resources for ECTs to access (e.g. The Sutton Trust Education Endowment Foundation Toolkit; NCSL's Research and Development Network (Stoll, 2015); BERA/RSA (2014) guidance) but support is needed with navigating, interpreting, and applying research as identified by Pedder (2013 Presentation May 28, 2013):

Individual teachers need to balance externally focused search for new ideas beyond their own classrooms with internal reflection on practices and values tested and developed in their classrooms if they are to learn continuously instead of continuously complying with new ideas without effect.

In promoting research literacy, the importance of "research advocates with skills, knowledge and aptitudes to broker, facilitate and promote staff engagement with and in research" cannot be underestimated (Nelson, Spence-Thomas and Taylor 2015); the judicious use of such research partners working with ECTs is important (Rea, Sandals and Parish 2015). In supporting ECTs to navigate the research landscape pedagogical research needs to be more accessible to teachers, with clear demonstration of how concepts can be applied in the teacher context. Researchers have a responsibility to provide objective evidence.

Misunderstanding of individual difference constructs within the school context is evident in current debates regarding the informed use of research (Coe, 2017). Three of the articles featured in this special issue (Boothman, Kerr, and Hayes) consider the role of Dwek's (2006) mindsets on students' motivation and achievement. Dwek (2015) herself has frequently commented on the misapplication of her research highlighting common misconceptions, to include equating the growth mindset with effort, suggesting that effort alone can lead to success and praising students for effort rather than learning and therefore hiding rather than acknowledging achievement gaps. As noted by Dickens (2015) quoting Dwek, everyone has a mix of fixed and growth mindsets and the growth mindset is one tool for learning and improvement and should not be used as an accountability measure and excuse as to why learning is not taking place given the range of factors involved. The Educational Endowment Foundation (EEF) launch of a 'Changing Mindsets' programme in Hampshire (2013) reported little impact of training teachers about the growth mindset on pupil progress but did find progress when training pupils directly. This raises issues about how the techniques are applied and used in practice and the confidence of teachers in integrating such ideas into practice; an issue highlighted by Hayes (this issue) within a different context of teachers' efficacy in teaching primary level physical education.

Another classic example, is the misinterpretation of learning styles research as identified in the recent letter to the Guardian newspaper in England entitled "No evidence to back idea of learning styles" (12 March 2017). While the intention of the letter to highlight the importance of teacher critique around the validity of using certain teaching approaches in schools is good, the article fails in its promotion of the same bias that it is critiquing by holding onto outdated and ill-informed understandings of the learning styles field. The article while totally correct in its condemnation of the use of VAK learning styles (Sharp, Bowker and Byrne 2008) does not point teachers to valid and relevant learning styles research. For example,

visual and verbal styles do exist, there are two functionally and anatomically distinct visual processing systems: visual-spatial and visual-object with verbalization forming a separate processing system (Kozhevnikov, Kosslyn and Shephard 2005; Blazhenkova and Kozhevnikov 2009), and knowing about these is important in designing learning. Testing the validity of styles by referring to the matching hypothesis (that there should be positive outcomes if you match teaching to a learner's style) although frequently used to discredit styles research, is outdated given that individuals do not have just one way of processing (i.e. a single cognitive style); we have a profile of many cognitive styles (e.g. analytic, wholistic, intuitive; impulsive, reflective) and at different levels of information processing (Kozhevnikov, Evans and Kosslyn 2014). Everyone can use a range of cognitive styles, however, in practice we may rely on a relatively narrow range. It is, therefore, not possible or advisable to try and match teaching style to a student's cognitive style given that each individual uses a range of styles, and the fact that styles change; matching teaching style to the requirements of the task is advocated. The key issue here is the role of higher education in providing objective information, making ideas accessible to school teachers and showing them how they can be used effectively.

In supporting ECT research literacy with the current focus on 'what works' as part of the drive for evidence-based teaching in schools in England there is the inherent danger of "measuring what we can easily measure and thus end up valuing what we (can) measure" (Biesta 2008, 35). In developing this line of thought, Lewis (2015) highlights the importance of teachers clearly expressing and justifying what they value in order to promote what matters in learning from a disciplinary perspective. Enhancing understanding of different approaches to research including fine grained measures of learning gain is important to avoid misinterpretation regarding how to conduct and evaluate research. There is the

inherent danger of oversimplifying research through an emphasis on cause and effect when we inherently know that schools are complex systems with various dynamics at work and that features may collectively work together in different ways under different circumstances in different contexts (Pedder 2013). Furthermore, having access to research can empower ECTs to be able to think beyond the immediate context and to be able to scrutinise their own ‘research filter bubbles’ to examine bias in the ways in which they access and use information.

ECTs’ agency through research literacy

In supporting the development of ECT research literacy emphasis can be placed on enhancing their “abilities to claim intellectual space in these regulative times” (Brown et al. 2015, 27). Tackling ECT agency is fundamental given that this determines how individuals engage in the process of learning (Verberg, Dineke, Tigelaar, van Veen and Verloop 2016). It is about enabling ECTs to make research happen and to value the findings from their own practice and to engage with the wider literature to inform their learning and teaching in collaboration with their pupils and colleagues.

ECTs in the programmes discussed in this article found that exploration of their practice in collaboration with peers, with HEI expert support and access to key research significantly enhanced their sense of agency in schools by enabling them to be able to justify their approaches with the backing of high quality research. Pedder (2013) highlights that there is consensus on what constitutes effective professional development activities. Effective professional development initiatives need to be sustainable in supporting teachers to engage with the materials of practice within the classroom and school as an integral part of their daily work. To support research, teachers need time and access to appropriate tools and ‘experts’ to engage in meaningful reflection in and on practice with peers and pupils

(Desimone 2009; Garet et al. 2001; van Driel et al. 2012). In the two programmes outlined in this article ECTs engagement in research with their pupils and having their research acknowledged by others were found to be extremely important in building agency. The importance of talking to pupils about their learning is a critical dimension of good pedagogy (Husbands and Pearce 2012) and also supports pupils to engage in and with research to support their own self-management of learning.

Sustainability of in-school research cultures

The lack of sustained research opportunities in schools to enable ECTs to link their understanding of research to their knowledge of teaching and vice versa (NCSL 2012) need to be addressed and vehicles such as the two programmes highlighted in this article are important. However, such approaches need to be part of a whole-school approach to research-informed teaching and discussions about what a sustainable research culture looks like both within individual schools and as part of joint professional development opportunities afforded within clusters of schools such as teaching school alliances in England. In developing sustainable research cultures, inquiry needs to be interwoven into all structures, processes and systems within the school context as part of a critical pedagogic approach. How best to draw on external expertise such as that afforded by universities needs further clarification and exploration into how such partnerships can be built and maintained to enable sustainable, high quality research-informed practices.

In sum, teachers need to know, not only, how to locate and critically use research evidence but also how to actively engage in research with their pupils as an integral part of their everyday practice; research should not be seen as a separate entity but as a sustained and integral part of being a teacher professional. More knowledgeable understandings of individual difference constructs supported ECTs development of pedagogy and especially

the development of relational skills with pupils and colleagues. However, ECTs must have on-going support in connecting their own practitioner-oriented research with the broader body of research knowledge; crucially universities can be powerful brokers in this respect.

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