School-University Partnerships:
Fulfilling the Potential

Literature Review

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Key Messages from the Literature Review: *Fulfilling the Potential*

1. **Understanding the dynamic nature of school-university partnerships matters. The management of change is a necessary and constant function.**

School-university partnerships involve a wide spectrum of activity. They embrace both broad relationships between universities and schools focussed on widening participation in universities of under-represented groups, to the more specific relationship between faculties of education and schools, focussed on initial teacher education, continuing professional development, consultancy and collaborative research.

School-university partnerships can be sites of both struggle and enjoyment. They can involve clash of cultures, perspectives, and aspirations, whilst at the same time be valued for their dynamism, vibrancy and opportunity for children, teachers and the wider community to come together to bring about improvement.

School-university partnership working has raised both considerable expectations and disappointment. They are popular as a means of delivering more with less by making better use of existing resources and adding value by bringing together complementary services. However, this optimism is also matched by a spirit of pessimism by others who report on the gap between promise and implementation.

Effective collaboration requires breaking out of traditional roles and relationships. Nowhere is this more important than the need to revisit the traditional approach to research and knowledge production that promotes researchers as knowledge generators and teachers as translators. Schools and teachers need to be seen as research partners and a crucial part of the process rather than just the objects of enquiry.

Successful partnering often requires pragmatism and incremental change. The problems partnerships tackle are complex and involve multiple strands. Therefore, making headway can requires tackling each in turn and securing step by step small gains.

2. **Developing the capacity to work with different organisational structures and cultures matters. Each school-university partnership features different formal organisational arrangements and can thrive or falter depending upon the stability of partnership structures and culture.**

Structures and culture can get in the way of partnership working. There is a need for commitment and capacity building over the long term from both partners. However, this can be undermined when policy concerns interfere and affect the structure, culture and resources of partnerships in highly contradictory and uneven ways.

University organizational arrangements in particular can prove a barrier to partnering. The organisational structure of the university, reflecting the values underlying it, often limits its ability to do interdisciplinary work and team approaches and, in so doing, inhibits the building of a professional community within the university and with schools.

Cultural differences in school-university partnerships can pose significant barriers to effective partnering. There are stark differences in outlook between universities and schools relating to knowledge, language, audience, accountability and even mismatches in the different pace and scheduling of the working year.

3. Creating a bespoke partnership space, based on trust and mutuality, matters. Partnerships have their own dynamics based on building trusting relationships and the development of mutual respect.

Successful partnerships involve mutuality and symbiotic relationships. Much of the literature emphasises a mature view of partnering based on recognition of the value of all community contributions, of mutuality and a dynamic, often risky area, distinctive from either the school or the university.

Successful partnerships are built upon mutual trust. They foster a sense of transparency and vulnerability which can be a tool for bridging the school/university cultural divide. This cultural dialogue in turn can only thrive on trust.

Partnerships are a third space distinct from the culture of the partnering organisations. This "hybrid" space not only draws on the knowledge and discourses of two distinct communities but also facilitates them.

Partnership involves uncertainty and risk. In committing to the partnership there is a sense of uncertainty, of risk, of operating outside one's comfort zone - but at the same time it is a vibrant, creative space which may offer up potentially great dividends. The differences between schools and universities are thus seen as a source of creative tension rather than discord.

Mutuality can be achieved through joint working and joint development. One key element is to put in place arrangements by which school and university colleagues work together on specific developments and to support this activity with joint professional development. This helps to ensure that there is mutual learning and a values approach of mutual benefit, mutual esteem, and shared responsibility.

Partnerships can have a collaborative advantage or dividend. Mutually-constructed learning communities provide opportunities that are both different from and richer than the opportunities either the school or the university can provide alone.

4. Leadership matters. The challenge for school-university partnerships is to build capacity, commitment, and leadership to ensure and continuity and sustained impact over time.

Leadership is vital in ensuring coherence and success in such vibrant and volatile partnership environments. It is only when school leaders make it a priority that partnerships can be used as external sources of support and that joint research communities can become sustainable.

In successful partnership there is leadership vision combined with distributed leadership. Partnerships need to be led and have vision in order to be sustained over time. Leadership often bubbles up pragmatically to fulfil partnership tasks where it is needed.

Leadership across organisational boundaries makes an important contribution. A crucial feature in partnership leadership is how this operates across the boundaries between the partners and the pivotal function carried out by key roles. This emphasises the role of "the 'blended professionals' who work across institutional boundaries.

5. Conditions matter. There can be conflict of interest in partnerships. Successful partnerships draw upon shared values, mutual commitment and a wide range of expertise and material resources.

There are key conditions for successful partnership working. These relate to certain skills, dispositions and relationships and also to the issues of time and sustainability.

Material resources

Partnership working has its costs and requires commitment. Partnership can easily become a soft, warm and cuddly process of unchallenging relationships between professionals to achieve some modest outcome. Partnerships pose a challenge and have transaction costs - the time, energy and resources necessary to keep the partnership alive and well.

Funding is a crucial contributor to partnership success, but partnerships also need to develop strategies to persist in austere times. Without sufficient funding school-university partnerships struggle to survive. However, the very nature of partnership activity is that it takes place in a volatile political environment and that it inevitably produces new dilemmas and problems of practice.

Strategic fitness and relevance

Partnerships work well when there is joined-up coherence and strategic fit. Projects work best when relationships are developed over time, are strategic and support the missions of universities, colleges and schools involved in a targeted way.

Localism is an important feature of partnership working. This involves a sense of a coming together to jointly address problems and craft local solutions.

Successful partnerships are often design led and focussed on local problem solving. This involves a problem-centred approach that joins academic research, clinical practice and commercial expertise in sustained programme of activity.

Collaborative enquiry enables effective partnership working. What promotes and drives exchange of understanding and learning across the membrane between partners is enquiry. As problems are posed and solutions sought then expertise is located in different people and in different places within the partnership.

Successful partnerships have a wider community dimension. School-university partnerships may have an extended membership from the wider community including parents.

Ownership, power and control

Power and control issues are the most persistent features of school-university partnership dynamics. This has particularly focused upon who drives the partnership and the continuing perception of this being university dominated. Too often teachers' contextual knowledge feels inferior and "threatened" in comparison to what universities bring to the partnership.

Policy developments have aimed to move control towards schools. The recognition that, despite often good intentions, universities still tend to drive partnership direction and activity has resulted in some movement to shift power and control towards schools.

School driven partnerships can raise other concerns. Prominent among these are that it insufficiently takes account of the challenges of a school-based approach delivering the Initial Teacher Education (ITE) system at scale, or of the reduced incentives for Faculties of Education to participate. There is also the danger of schools becoming inward-looking, trainee teachers uncritically taking on the possibly poor practices of established teachers.

There is a need for all voices to be heard. The development of a partnership culture needs to be based on sharing and valuing differences as an alternative to the power and control pendulum swing between universities and schools.

Effective outcomes are generated through ownership by the partnership. Meaningful and potent outcomes are more likely when they are conceived and achieved as part of the partnering process itself.

Monitoring and evaluation

Successful partnering requires more attention to monitoring and evaluation. Understanding on what works and is generated in local contexts can help to inform wider policy and scaling up.

6. Involving the wider community to improve the benefits of widening participation and increase STEM (Science, Technology, Engineering and Maths) participation matters.

Widening participation is a persisting problem. Despite a number of attempts to address this issue, participation and retention of students from lower income families in university remains extremely low.

Improving widening participation requires reciprocal action and partnering with the wider community. There needs to be close reciprocal interaction sustained over time within the partnership. There is also a need for the university to reach out to the community and develop both an educational and social presence in the lives of the residents of its immediate community, thus enhancing its credibility.

Increasing STEM participation and number of STEM graduates involves early intervention. Action post 14 is too late; more needs to be done in the early stages of education. There is also a need for more capacity and greater coherence in research and evaluation.

School–University Partnerships:
Fulfilling the Potential Literature review

Section 1: Introduction and conceptual framework

Thinking and debate about school-university partnerships have a considerable pedigree. There is extensive literature ranging across North America, Australia, Europe and the UK dating back over a number of decades. The scope of this literature is also wide and eclectic. It embraces both broad relationships between universities and schools focussed on, for instance, widening participation in universities of under-represented groups, to the more specific relationship between faculties of education and schools, focussed on initial teacher education, continuing professional development, consultancy and collaborative research.

Learning lessons and moving forward

Indeed in revisiting this literature, and also considering more contemporary material, there is a sense of deja vu, of paths being previously trod, of ground being made and then lost again. This is captured strongly in a previous literature review by Smedley (2001) in which she reflects on the research into school-university partnerships of the 1980s, (related to teacher education) which struck an overwhelmingly positive note: "Almost without exception, the publications from the mid-1980s commence in a celebratory fashion… In theory, teachers and lecturers were to work together to provide a programme shaped to meet the specific needs of the groups of student-teachers working within a particular setting … Collaboration for the planning and implementation of the new undertaking was expected to encourage better understanding of the partner's working life, expectations and expertise" (Smedley, 2001:190&191). This is then contrasted with an equally strong sense of disappointed hopes, even disillusionment, during the 1990s onwards which highlighted the "litany of barriers to genuine partnership" and where it was concluded: "The spirit of optimism brought by the change of the past decade has been matched by a spirit of pessimism as staff from the two sites report the gap between the promise and its implementation" (Smedley, 2001:193).

Similarly, McLaughlin and Black-Hawkins (2006) reflect ruefully on the often faltering progress made in school-university research collaborations. In their research to understand more about the complexities of such partnerships they see as problematic the time-limited and project-focussed nature of much partnership work, together with "the hard distinction of roles between university and teacher colleagues in terms of knowledge generation". They illustrate this with a quote from one of their headteacher interviews: "We did lots of research, but… it became like a comet in the firmament for a while and then fizzled".

So, whilst drawing lessons learnt from past experience, the clear challenge for this current review of school-university partnerships (and indeed for their future development), is to move forward rather than re-trace steps, so that the gains of such partnerships are more than a passing light in the firmament. It is to identify the benefits of collaboration and explore how these can be sustained over time, through all the vicissitudes of change that affect both school and university sectors (James and Worral, 2000). To echo the challenge set by those leading the School-University Partnership Initiative (SUPI), it is to learn more about how to "facilitate the development of structured, strategic, sustainable and equitable partnerships between the schools and universities" (Chambers, 2014). This concern, then, is a major focus of this review - keeping the flame alight, sustaining school-university partnerships through building capacity and thus ensuring continuing and sustained impact on learning.

The changing educational landscape

There are a number of policy developments and issues that have been powerful drivers for increased partnership working between schools and universities and these are highlighted in italics in the following overview.

First, there is the considerable emphasis that is being placed upon *collaboration*. Over the last decade there has been increasing expectation that educational organisations like schools working together (and with other partners like universities) in strategic partnerships and practical networks are central to future improvement in the system. "The pattern of education in England is shifting. Schools that once were islands are becoming connected. Indeed, it is increasingly rare to find outstanding schools that do not have a web of links with other schools. Competition remains, but now co-exists with collaboration

and the creation of formal alliances through federations and chains." (Matthews, Higham, Stoll, Brennan and Riley, 2011:5).

This movement is coupled with an emphasis on the *autonomy* and "freedom" of the school and the encouragement of a *diversity of school organisation* and provision (e.g. Academies, Teaching Schools; Free Schools): "We expect schools to use their increased autonomy to explore new ways of working together – but collaboration in the future will be driven by school leaders and teachers – not bureaucrats" (DfE, 2010a, page 52). Some commentators state that such Government policy announcements "strike a startling new note," observing that "the improvement of schools, they are told, rest primarily with them – not the government, local or central. The aim should be to create a self-improving system" (Hargreaves, 2011:4). However, the drive to devolve control to collaboratives of schools working within a diverse system, and to reduce the 'middle tier' role of the local authority, has been a feature of successive UK governments over the last two decades (Handscomb, 2012). This radically changing and fragmented school organisation landscape has been perceived to pose significant challenges to the university sector seeking to foster partnership working with schools: "the development of academies and other new school types increases individualism and autonomy in the school sector … (so) individual institutions will wish to weigh carefully the resources required and the advantages to be gained before entering into substantial partnership commitments" (HEA, 2012:3).

These changes, particularly when they are linked to the reallocation of resources, have had considerable impacts on the roles that schools and universities wish to play in partnerships related to ITT. Also the most recent drive to improve use of research in schools (e.g. EEF launched a £1.5 million fund to support this drive) and the inclusion of Research and Development as one of the Big 6 for teaching school alliances have led both sectors to rethink about their contributions across a wide range of areas. So more is being heard from schools about what else universities can do to help them engage in research and improve their practice (Gu, Rea, Hill, Smethem, and Dunford, 2014). In this sense, the self-improving system has created tensions as well as new opportunities which invite both sectors to revisit their roles and commitments in "sustainable partnerships". Similarly in this new school organisational environment there has renewed emphasis on the need for collaborative research partnerships: "… system-wide schools, colleges and universities will need to act in collaboration and partnership: pooling knowledge and expertise, sharing outcomes and informing developments in policy and practice" (BERA-RSA, 2014:24).

The drive towards increasing collaboration is also a major trend within the university sector. There has been a concerted push towards *greater public engagement* to "better connect the work of universities and research institutes with society" (NCCPE: 1). This in turn relates to a range of concerns and influential movements. Not least among these is the whole issue of *Widening Participation*, which focuses on the need to increase recruitment and retention in university programmes from under-represented groups. This derives from the key social mobility policy driver of ensuring everyone has the opportunity to study at university and fulfil their potential, irrespective of their background or circumstances (RCUK, 2014). It also connects to fundamental concerns related to STEM and in particular STEM graduates entering the job market.

The literature affirms that the challenges posed by these issues are considerable, highlighting in particular implications for reassessing and changing the nature of university culture. For instance, the report by the "Science For All" expert group identified how the professional culture of many academic intuitions still inhibits engagement and partnering (SFA, 2010). As this current review will demonstrate, effective partnering shines a searching light on the restrictive features of both *school and university cultures*. However, much of the literature across the world emphasises a particular need for shift in cultural values and structural arrangements within the university sector (e.g. Lieberman, 1992 in the US; Dyson, 1999 in Canada; Smedley, 2010 in Australia; and James & Worral, 2000, McLaughlin & Black-Hawkins, 2006, and Baumfield & Butterworth, 2007 in the UK). Indeed, it is significant that the eleven UK higher education/school links projects initiated in 2009 (HEFCE, 2011) were continuing to grapple with issues identified in much earlier literature: "The organizational structure of the university, reflecting the values underlying it, has limited our ability to do interdisciplinary work, team research, and team writing and, in so doing, has inhibited the building of a professional community of our own, as well as one with schools" (Lieberman, 1992:11).

The focus on the school and school collaboratives as being the agents for improvement also links with the issue of *engagement with school-based knowledge,* practitioner research and research engaged schools. This was initially raised in often frenzied public debate in the late 1990s. Its focus was on the perceived limited usefulness of educational research as it had generally been conceived, conducted and controlled from within universities, and the need for practitioners to be actively involved in all phases of research (Hargreaves, 1996; Hillage et al, 1998; Rudduck & McIntyre, 1998). Similarly others in America had been establishing the principle that "Effective collaboration requires breaking out of traditional roles and relationships. Nowhere is this more important than the need to revisit the traditional approach to knowledge production that promotes researchers as knowledge generators and teachers as translators" (Bickel and Hattrup, 1995:47). Instead there was a growing movement to recognise and utilize the in situ knowledge that teachers brought both intuitively and through practitioner research. This involved the need to "render explicit the thinking and knowledge that teachers tend to keep implicit about their practice," and tackling the status issues where the teacher's "'lowly' practice-saturated knowledge" was compared unfavourably with "more highly respected, pure or applied knowledge" of universities (Ebbutt, Worrall and Robson, 2000:322&334). Instead many commentators (e.g. Cochran-Smith and Lytle, 1999; Arhar, et al, 2013) saw teacher research as having the "potential to redefine the knowledge base for teaching, (and to be) a challenge to the hegemony of the university," and to transform rather than simply add to what is already known about teaching and learning (Baumfield and Butterworth, 2007: 413).

These questions about "What is knowledge? And whose knowledge counts as legitimate? What do we really mean by collaboration and colleagueship? Who should drive the agenda for change? Us? Them?" (Lieberman, 1992:6) are pivotal to considerations about partnering. They raise fundamental issues of ownership and accountability and of *power and control* which form the backdrop of much school-university partnership development. This has played out not just in relation to research on the nature of teaching and learning, but also in terms of the different understandings about the nature of partnership itself. It has had particular resonance in relation to the shifting balance of school and higher education roles in initial teacher education, moving from university driven partnership programmes of the 1990s to the current School Direct arrangements. It is also resonant with the current UK research council's drive for 'impact' which requires academics to step out of the ivory tower and to be engaged in activities which "increase our knowledge transfer and collaboration to get our research into policy and practice" (ESRC website).

The framing of the review

So, taken together these range of policy drivers and trends have helped to inform and shape the literature review. Following this initial section mapping out the conceptual framework, the review is structured into two further sections: The nature and dynamics of school-university partnerships and Features and outcomes of effective partnerships.

In the first section the review explores the major forms of school-university engagement and how these have changed over time. This includes engagements between the university as a whole and schools (or groups of schools) on developments like STEM and widening participation, and also the types of partnering activity between university departments and schools. These include initial teacher education, continuing professional development, consultancy, and collaborative research on teaching and learning and school improvement.

In considering the nature of research and knowledge generation within school-university partnerships there is an examination of the fundamental issues of ownership and accountability and the power and control tensions that have been found to pertain. This then leads to an in-depth consideration of the contrasting cultures of schools and universities, and the challenges that this poses for effective partnering. The review then examines a continuum of development from the persisting prevalence of university driven partnerships, to the reactive call for more school-led partnering, to finally explore partnership models founded on co-development and mutuality. In looking at these cultural dynamics, the review particularly considers the range of literature which highlights the complexity, sense of ambiguity, vulnerability and conflict that are involved in school-university partnering and how these may be perceived as not only inevitable but also necessary and positive features of how the partnership is crafted as a vibrant, collaborative "precarious organisation" (Miller, 2001).

Throughout this section there are indications of particular models and examples from the literature that helpfully illustrate school-partnering practice, including key barriers, inhibitors and enablers. In the following section on outcomes and how these can be realised, these illustrations are specifically drawn together and articulated to help portray effective practice. This section begins by looking at what the literature provides in terms of features and gains of successful partnerships. Then the review explores a range of material on the building and sustaining of effective school-university partnerships, and what has been suggested as necessary conditions for this. In particular it looks at issues related to roles and responsibilities, leadership, and how partnerships can be sustained over time in the face of a continuing climate of change and financial austerity experienced by both schools and universities.

Section 2: The nature and dynamics of school-university partnerships

Towards a definition

In the wealth of research and commentary on school-university partnerships there are various attempts to provide a definition. One commonly cited is: "a deliberately designed, collaborative arrangement between different institutions, working together to advance self-interest and solve common problems" (Goodlad, 1988:13). Similar perspectives have been given in more recent times: "Partnership working requires a structured approach in which institutions plan a common approach and deliver a programme of work to meet agreed objectives" (HEA, 2012:3).

School-university partnerships have been described as "the most frequently recommended approaches to educational reform" (Dyson, 1999:411). Striking a similar tone, in their research into the implementation of STEM education in three Australian schools, Hudson, English, Dawes and Macri (2012) focus on partnerships transforming their members through leadership: "University community partnerships involve motivating potential stakeholders, promoting collaboration and team effort, communicating clear commitments to educational development, and distributing leadership" (Hudson, English, Dawes and Macri, 2012:773).

Thorkildsen and Scott Stein (1996) characterise the rationale of such partnerships as embodying a fundamental sense of mutuality and reciprocal benefit, reflecting that: "successful partnerships are symbiotic relationships" (Thorkildsen and Scott Stein, 1996:80). They bring together the views of a number of others that strike a common note, portraying school-university partnerships as "joined intimately in mutually beneficial relationships" (Goodlad, 1988:14) and as being "characterized by (a) mutuality of concern, (b) reciprocity of services, (c) an ongoingness, and (d) a belief in partnership parity" (Klein and Dunlap, 1993:56). So the vision of a mutual, co-constructed relationship was in evidence from the outset; however, as we shall see in this review much of the practice has struggled to achieve this aspiration.

Great expectations; types of school-university partnerships

Over the years there has been much expected of school-university partnerships, which in turn has increased the sense of frustration and disappointment when they are perceived not to have delivered. So for instance in setting the context to their research into differing perceptions of teacher development within a partnership, Bartholomew and Sandholtz (2009) grandly state that "the underlying benefit of successful partnerships is that they offer a means of ending the fragmented approach to teacher education, professional development, and school improvement" but then reflect "although school-university partnerships offer significant benefits, the task of establishing and sustaining successful partnerships is challenging" (Bartholomew and Sandholtz, 2009:156). Baumfield and Butterworth (2007) observe that in considering the relationship between schools and education departments in universities, they have traditionally been connected through a number of activities which can be grouped around three broad areas: initial teacher education (ITE) and continuing professional development (CPD), consultancy and research. Over time the nature of this relationship has changed from a rather paternal approach to one that is more focussed on partnership: "in all three areas there has been a gradual shift in emphasis so that the focus is on partnership and collaboration rather than assuming that theoretical knowledge is exclusive to the university sector" (Baumfield and Butterworth, 2007:412).

Initial teacher education

Nowhere is this more in evidence than the changing shape of ITE over the last thirty years. In his case study research of a school-university ITE partnership Taylor (2008) begins by mapping out the history of such collaboration over a fifty year period, from the rise of teacher training colleges in the 1950s, through the changes from university driven programmes to the shift towards school-based training. He portrays this as being a difficult and even traumatic challenge for universities: "ITE… has to form dynamic relationships with those – government and schools – outside the university sector. Such relationships are the antithesis of what happened traditionally within the university sector, and require negotiation, shared purposes and collaboration with those who face entirely different institutional contexts to universities" (Taylor, 2008:68).

In North America, the literature on school-university partnerships is extensive and longstanding (see the review of this literature by Miller and Hafner, 2008). Much of this relates to collaboration around teacher training and development, particularly in the context of "professional development schools" which are similar to the training schools that subsequently developed in the UK. The closer physical and professional arrangements between schools and universities demanded by such collaborative models were intended to improve the quality of teacher education available to student teachers and "were expected to encourage better understanding of the partner's working life, beliefs, expectations and expertise" (Smedley, 2001:191). However, a number of commentators observed that ironically time devoted to establishing the mechanics of how the partnership would operate diverted attention from securing a shared understanding of the nature of schooling, learning, and teacher development: "school restructuring and university-school partnership proposals tend to ignore the latest thinking about the construction of knowledge, professional development, and adult learning" (Myers, 1996:7). This is echoed in more recent literature which identifies key barriers to effective partnering in teacher education activity as relating to: *organisation* – ranging from contractual arrangements to communication between partners; *division of labour* – including need for equal involvement in goal setting over a sustained period; the persistence of an *apprenticeship outlook* in which teacher education is seen as merely training and inducting teachers into the current status quo norms of schooling rather than involving them in a process of making meaning together; and the whole related *issues of time, rewards and funding* (Smedley, 2001; Bartholomew and Sandholtz, 2009; HEA, 2012).

Overall, what comes through powerfully is on the one hand the need for commitment and capacity building over the long term, from both partners, but on the other hand, this being potentially highly problematic, especially when policy concerns interfere and affect the structure, culture and resources of ITE partnerships in highly contradictory and uneven ways. For instance, in England there are considerable expectations on Teaching Schools of which improving the quality of ITE is just one, and the political messages regarding the contribution of universities have been perceived as ambivalent. Although the government has affirmed "an important role for universities in any future ITT [Initial Teacher Training] system", it signals a rather subsidiary role in "responding to the demands of schools for high quality training to supplement school-based practical experience" (DfE, 2011a:16; para14). At the same time the Department for Education (DfE) does emphasise "the quality of partnership" and the intention to make this an important focus of inspection of ITT (DfE, 2011b:13; para8).

A recent and significant input to this debate has focused on the fundamental role of research in teacher education and the concomitant contribution this can then make to a self-improving education system (BERA-RSA,2014). This echoes the thinking of an earlier National Education Research Forum (NERF) enquiry about the need for teachers to be users of research, carry out their own research, and to be participants in the research of others (Dyson, 2001). So the BERA-RSA inquiry sees this contribution of research to teacher education as four-fold:

- First, the content of teacher education programmes may be informed by research-based knowledge and scholarship, emanating from a range of academic disciplines and epistemological traditions

- Second, research can be used to inform the design and structure of teacher education programmes

- Third, teachers and teacher educators can be equipped to engage *with* and be discerning consumers *of* research

- Fourth, teachers and teacher educators may be equipped to conduct their own research, individually and collectively, to investigate the impact of particular interventions or to explore the positive and negative effects of educational practice

        (BERA-RSA, 2014:11)

Continuing professional development

University departments of education have a long history of working with schools on continuing professional development and consultancy and this has become a clear feature of partnership activity. It is seen as bringing an important dimension to CPD where "school-university partnerships offer the opportunity to increase the professional development options for teachers" (Sandholltz, 2002:817). Interestingly, whilst there has been an increasing emphasis that, in order to be effective, CPD needs to be school-led, school controlled, focussed on the classroom and linked directly to improvements in teaching and outcomes for children, there has been an accompanying concern that it may become more insular, impoverished and reinforce poor practice (Johnson, Wetherill, High and Greenebaum, 2002). Indeed reviews of CPD have identified that it is most effective when there is a judicious collaborative blend - school driven, along with strategic external /specialist contribution (CUREE, 2003; Cordingley and Buckler, 2014; Handscomb, 2014).

Again, as with ITE, over a period of time there have been shifts in approach and practice. Instead of universities being providers of professional development expertise the emphasis is more on a relationship based on exchange and dialogue and "support for a common vision of good professional development, which respects and builds on the knowledge and expertise that teachers already have and recognises their intellectual leadership capacity" (Baumfield and Butterworth, 2007:412). In England, increasingly, evidence-based teacher enquiry and joint practice development between schools are perceived by teaching school alliances as impetus for CPD and part of the mainstream school-to-school improvement. Universities are seen as having much to contribute to this development and partnerships with higher education institutions are perceived by schools to have provided promising research and development opportunities for them and their teachers (Gu et al., 2014). So this recasts professional development as a collaborative enterprise within the school-university partnership.

Interestingly, this emphasis on professional development being a collaborative endeavour does not necessarily mean the university partner having to be unduly reticent in bringing its expertise to the fore, or providing leadership on innovative practice. So for instance, in Australia the University of Melbourne perceived that "too many education policies address matters outside the classroom," and saw the need to channel its resources "to where they will make the biggest impact on learning outcomes – into teachers and teaching" (Rickards, 2014:1). Consequently the university developed its "Clinical Teaching" approach in which it worked with schools to target their assessment and teaching practices to maximise their impact on improving student learning (University of Melbourne, 2014).

Collaboration in CPD therefore draws on the mutual input of each partner. As Pellerin (2011) reflects from her Canadian research, this does not deny the potential of the university consultant's contribution to the teacher's professional learning, but places this alongside the knowledge and expertise that teachers and others within the collaborative also bring to the table. This in turn connects with the concept of school-university partnerships as collaborative research communities and their contribution to improving practice.

Research communities and knowledge building

One of the fundamental issues related to teacher education and professional development within school-university partnerships is the stance taken towards research, enquiry and knowledge. This also links with the whole question of respective university and school cultures and the dynamics of power and control within partnerships, which the review will explore in depth later.

As long ago as the early 1990s there was a move towards regarding the teacher as knowledge generator and "a genuine interest in seeing knowledge production as a shared responsibility of the practitioner and research communities" (Bickel and Hattrup, 1995). There were calls for a radical change in the way in which school-university collaborations operated to nurture a community of enquiry and recognise the knowledge about teaching and learning that practitioners bring:

"Can we connect schools and universities, building community that provides for growth and change, and sharing responsibility for and involvement in practice and research?" (Lieberman, 1992:5)

"In… school/university partnerships, teachers are viewed as individuals with a tacit knowledge base, who build on that knowledge base through continuous enquiry and analysis" (Sandholtz, 2002:817).

More recently, in a similar vein, Sharples (2013) observed that 'Perhaps one of the most significant shifts over the last ten years in relation to practitioners' use of research has been the realisation that simply passively disseminating research – "packaging and posting" – is unlikely to have a significant impact on people's behaviours (Nutley et al., 2007, Levin, 2011)' (Sharples,2013: 18). In agreement with Nutley et al. (2007), he argues that network-based approaches, "which support direct engagement and dialogue between researchers and users, are proving to be particularly effective" (2013: 18).

Thus, in terms of who frames and drives research there were increasing calls for schools to be a crucial part of the process rather than just the objects of enquiry: "to respect the integrity of the schools as research partners rather than research site" (Cordingley and Bell, 2002:160). The work of Cochran-Smith and Lytle is regularly cited in the literature when considering the relationship between research and practice and "blurring the boundaries between researcher and teacher through teacher research" (Arhar et al, 2013:220; Cochran-Smith and Lytle, 2009). In their initial work into teacher research within communities and what counts as knowledge, they set out distinctions between *Knowledge-for-practice*; *Knowledge-in-practice;* and *Knowledge-of-practice* (Cochran-Smith and Lytle, 1999). *Knowledge-for-practice* is based on the assumption that the knowledge teachers need to teach well is produced primarily by university-based researchers and scholars in various disciplines. *Knowledge-in-practice* is "what very competent teachers know as it is expressed or embedded in the artistry of practice... This knowledge is acquired through experience and through considered and deliberative reflection about or inquiry into experience" (Cochran-Smith and Lytle, 1999:255&262).

Regarding Cochran-Smith and Lytle's third concept, *Knowledge-of-practice*, the perspective is that what makes teaching a profession is "not knowledge generated exclusively or even primarily by experts who have studied about teaching and schooling from their professional locations outside of schools. Rather, it is assumed that professional expertise comes in great part from inside the teaching profession itself." This kind of knowledge is generated across teachers' professional life span. They do this through making their classrooms and schools sites for inquiry, connecting their work in schools to larger issues, and taking a critical perspective on the theory and research of others. In this sense they become part of the wider research community and this emphasises the important role played by school-university partnerships, teacher networks and other school-based collaboratives and alliances. Interestingly, this conception of research engagement becoming an integral part of teacher professionalism is also echoed in the recent final report of the BERA-RSA inquiry into the role of research in teacher education which characterises this in terms of *research literacy*: "Research literacy is viewed as a key dimension of teachers' broader professional identity, one that reinforces other pillars of teacher quality: notably subject knowledge and classroom practice" (BERA-RSA, 2014:10).

Cochran-Smith and Lytle conclude their analysis with the notion of *inquiry as stance* as characterising the empowering role of teachers within such research communities as school-university partnerships. Here, they take pains to distance teacher enquiry from the common notion of a time-bounded project or discrete activity within a teacher education course or professional development workshop. Instead: "Teachers and student teachers who take an inquiry stance work within inquiry communities to generate local knowledge, envision and theorize their practice, and interpret and interrogate the theory and research of others (Cochran-Smith and Lytle, 1999:289).

The issues raised here - of *questioning the nature of project bound engagement* and of the significance of *local knowledge* - are reinforced by much of the other literature, and they feature as some of the key messages arising from this review. So, for instance, in their description of sustaining a school-university partnership over a ten year period James and Worrall (2000) reflected that this was dependant on focussing on an issue or problem rather than being initiative or project based. Similarly in their exploration of useful practice-based research within, across and between eight schools and a university, McLaughlin and Black-Hawkins found that the "the time-limited and project-focused nature of research is seen as problematic, as is the hard distinction of roles between university and teacher colleagues in terms of knowledge generation" (McLaughlin and Black-Hawkins, 2004:272).

What is powerful, then, is when local knowledge is harnessed and utilised to problem solve specific improvement issues, facilitated through enquiry communities like school-university partnerships, and connected to wider research knowledge and social developments. So such "local knowledge is understood to be a process of building, interrogating, elaborating, and critiquing conceptual frameworks that link action and problem posing to the immediate context as well as to larger social, cultural, and political issues" (Cochran-Smith and Lytle, 1999:292).

This recognition of the potency of local knowledge is longstanding and spans the ages. In the 18th century Giambattista Vico (1725) captured its significance in the following description: "This is a sort of knowing which participants in an activity claim... the knowledge of the actors as against the audi-ence, the "inside story" as opposed to the "outside" vantage point; knowledge by "direct acquaintance" ...or by sympathetic insight into those of others" (cited in Berlin, 1978:117 and Lieberman, 1992:6). It also features centrally in contemporary thinking and practice. Powerful examples are the work of Bryk, Gomez, and Grunow (2011) exploring practitioner engagement in local problem solving through Networked Improvement Communities, and the recent proposals around design-based research partnerships which take a solutions approach and focus on long-term, in-depth work within a local district (Coburn, Penuel and Geil, 2013). These will be explored further when suggesting helpful approaches in section three of this review.

For now, and in concluding this consideration of school-university partnerships as research communities, it is helpful to understand that they exist in a number of forms but are enriched when ownership and all aspects of the enquiry process are shared within the whole collaborative of university and schools. With this perspective, McLaughlin and Black-Hawkins (2004:274-277) suggest a range of six models along a continuum ranging from *"school bound, individual teachers mentored by university 'research experts'"* to *"within and between institutions, all partners are experts, facilitators and critical friends to one another".* They state that whatever model is adopted it would be hard to engage in a joint research partnership without holding certain key values such as:

- asking questions about practice
- collecting evidence
- reflecting on practice and data
- considering partnership to be valuable

(McLaughlin and Black-Hawkins, 2004:270)

More recently, much more has been written about the need for a mind-set shift in schools which fosters learning cultures that are enquiry-oriented and evidence-based, so that schools are able to adapt research evidence to suit their specific contexts and create their *local knowledge* that informs decision making and improvement in practice (e.g. Petty, 2006; Levin, 2010; Scott and McNeish, 2013). School-university partnerships as research communities will have much to offer to this culture shift. However, what has been relatively less emphasised in the literature is the role of school leaders in creating conditions which enable joint research partnerships to develop collective and organisational capacity and to spread and sustain practice change (Campbell and Levin, 2012). Evidence from the school effectiveness and school improvement literature suggests that it is only when school leaders make it a priority that partnerships can be used as external sources of support (Levin, 2010) and that joint research communities can become sustainable.

Widening participation

In the past it was felt that research on school-university partnerships tended to "focus on the complexities of the two educational structures with little emphasis on how such collaboration has served students" (James and Haig-Brown, 2001:227). However, in more recent years this has changed with a range of research, initiatives and commentary highlighting in particular the issue of wider participation in higher education. The locus of this concern has been with the under-representation of pupils from disadvantaged groups in university and also with the low retention rates of those who are admitted. The report of the Labour Government in the UK sought to shift this focus from a debate about the percentage of pupils from lower socio-economic groups going on to the most selective universities, to "the much more extensive issue, dealing with increasing the percentages of children from lower socio-economic groups going on to higher education" (DCSF, 2008:10). The political pressure of improving university social justice statistics and the provision of central government funding under the Labour government led to the creation of WP teams in universities across the country.

Despite a number of attempts to address this issue, participation of students from lower income families remains extremely low (Sutton Trust, 2008; Panel on Fair Access to the Professional, 2009; Nichol and Reynolds, 2010). The data on widening participation in higher education released by the Department for Business Innovation and Skills in the UK shows that the gap between school pupils receiving free school meals (FSM) and the Non-FSM pupils entering Higher Education by the age of 19 has remained steady at 18 percentage points from 2007/08 to 2010/11 (Inside Government, 2014). Frustration has

been expressed that when moves are made to increase the number of university places "the number of students from middle-class families dramatically increased, often 'colonising' the entry routes designed to encourage the working classes, making the inequality between classes constant and extremely resistant to change" (Nichol and Reynolds, 2010:4).

In research carried out in the Plymouth area by the local university under the Higher Education Funding Council for England (HEFCE) -funded research programme, the possible reasons for low participation of these students included: local secondary schools are likely to have poor GCSE results; their parents' lack of experience of HE; the fact that no-one in their community is likely to have a degree; and above all, a low level of expectation of the teaching body that inadvertently 'blocks' pathways both to higher education in general and Fair Access of under-represented groups in particular (Nichol and Reynolds, 2010:4).

These findings have been echoed in research from other countries. In Canada the failure of such students to progress to higher education was seen as "not merely linked to their individual efforts, social situations, or cultures but also to educational and social contexts and structural barriers that limit their capacity to imagine and pursue certain possibilities after high school" (James and Haig-Brown, 2001: 231). Similarly, in research conducted into school-university partnerships with 18 local elementary and secondary schools in low-income, urban communities in California, cultural factors such as teacher expectations and race-based assumptions about students, school climate, and students' lowered aspirations, also limited minority students' prospects for college (Jones, Yonezawa, Ballesteros, and Mehan, 2002).

This has led to a consensus view that concerted action needs to be taken, not least within school-university partnerships, to address these fundamental educational, cultural and societal barriers, as well as organisational issues within the universities themselves. Such action included calls for early intervention to improve the educational outlook and performance of children in school: "It is time for those who care about widening participation to focus on raising attainment and raising aspirations from a much earlier age so that we can deliver the best education possible for all our young people"(DCSF 2008:10).

In a HEFCE-funded study on models of university service in the community (Day, Gu, McIntyre, Brown and Curtis, 2010), the researchers argue that effective WP partnerships with *schools* are more than a "customer-supplier" service relationship. Rather, universities need to act simultaneously in the role of 'initiator' (of opportunity) and 'broker' (between academics, university students, schools and pupils). An important feature of the WP partnership is that "it takes the form of a dispersed partnership" given the large number and wide variety of internal and external bonds and relationships involved (2010: 21). Externally, there are three types of relationships with schools, ranging from a) an **information diffusion** oriented relationship, b) a **supportive facilitating** relationship, and c) a **closer cooperative** relationship which is made up of direct links with, first teachers, and later with students, with the school acting as a gatekeeper. The internal relationships with *academics* tend to be informal and flexible and the level of their engagement ranges from a) **attempting to engage,** b) **developing involvement** and c) **close reciprocal interaction.** Day et al. argue that "whilst the WP team provides a leadership and brokerage role in matching internal expertise with external needs, this role with schools and pupils may be most accurately described as one of development and diffusion" (2010: 25).

In a study over a six year period in Toronto of what difference a partnership can make for students, particularly working-class immigrant and minority students whose needs are least addressed by the educational system, it was found that there was a basic disconnection between the university and the community (James and Haig-Brown,2001). So a key recommendation of the research was that the university needs to reach out to the community and develop both an educational and social presence in the lives of the residents of its immediate community, thus enhancing its credibility. In similar research in the United States, it was concluded that cultural and structural changes were needed to smooth pathways to higher education (Jones et al, 2002). These changes involved cultivating new beliefs about the basis of school achievement which saw that that talent is not distributed by race, class, and gender, and ensuring access to a college-preparation education should not be reserved for a precious few. They also included closely examining admissions policies so that under-represented groups were not being disadvantaged. In the UK it was found that there was an accompanying problem with retention rates because even when teenagers from lower income families join a university, their drop-out rate is much higher than for those with middle-class backgrounds (Joseph Rowntree Foundation, 2005).

STEM

There have been a range of issues and concerns expressed related to STEM. The main cause of this worry has been the stark shortage of STEM graduates entering the job market. The business world has consistently expressed grave concern that although in the long term, three out of four businesses (72%) rely on people with STEM skills, the current supply of STEM graduates is not meeting business needs: "Only 16% of UK undergraduates are studying physical sciences, technology, engineering or mathematics. And the UK has seen a greater decline in the proportion doing these valued subjects than many of our OECD [Organisation for Economic Co-operation and Development] competitors" (CBI/EDI, 2010:35).

Since 1997, there has been a reported general decline in the percentage of pupils studying A-levels in Biology, Chemistry and Physics – in 2008 6.5% of students were studying Biology (down from 7.2% in 1997); 4.9% were studying Chemistry (down from 5.5% in 1997); and 3.3% were studying Physics (down from 4.3% in 1997). "Consequently there are fewer graduates in these areas – not least to go into industry and research – but importantly, fewer specialists returning to school to teach" (Garrick with Ballantine-Dykes, 2011:6). Whilst 2011 saw a rise in the number of pupils taking STEM A-Levels, it is too early to state whether the overall trend of decline is reversing. The UK generally compares favourably in international comparisons of young people's attitudes towards science and maths, particularly in the value they place on maths, their confidence learning maths, and the extent to which they recognise the usefulness of science. However, in recent years the UK has lost ground in areas such as enjoyment, interest, and motivation to pursue science and maths further (DfE, 2010b:6, para 13).

This disquiet about STEM has led to a range of initiatives by organisations over the last decade in the USA, Australia and the UK (Hudson, English, Dawes and Macri, 2012). Many have called for concerted action in schools, leveraged by school-university partnerships and other agencies working with them. The Michigan STEM Partnership offers a good example of such concerted, joint actions between employers, educators, students, parents and legislators in order to provide support for effective STEM education and serve the workforce needs of STEM fields in the Michigan State. A number of reports stress the need for early intervention, emphasising that most young people form their attitudes to science between the ages of 10-14 (TISME, 2013) and that because trying to engage a disinterested 14 year old is too late, higher education champions need to be linked to each school, including primaries (Garrick with Ballantine-Dykes, 2011). An associated proposal has been the call for more informal and non-classroom based STEM learning (Wellcome Trust, 2012a and 2012b).

Under the previous UK Labour Government there was an attempt to pull together "the development of communications and relationships between organisations with a STEM agenda" and provide "impetus for stakeholders to work collaboratively, united by a shared ambition to improve the availability and coordination of STEM related information and provision" (NFER, 2011: i). Nevertheless there is still a prevailing view that despite all the initiative investment, STEM continues to be a persistent concern. Perhaps one of the strongest issues to emerge from all the STEM investigations is the need for more capacity and greater coherence in research and evaluation. So, for instance the systematic review of STEM literature carried out by the Wellcome Trust identified the most striking outcome as being the "underlying challenges faced in building research capacity", particularly in the significantly under-investigated area of student choice (Wellcome Trust, 2010:5).

Power and control: all voices to be heard

Perhaps the most persistent features of school-university partnership dynamics are the issues of power and control. This has particularly focused upon who drives the partnership and the continuing perception of this being university dominated. Twenty five years ago this was described in stark, almost caricature terms: "The administrators (school leaders), predominantly male, went to meetings with university people to learn about new ideas to improve their schools; the teachers, predominantly female, were to receive what knowledge was thought appropriate. While we initially bought into this "trickle-down" theory of change, we soon realized that, if we wanted real reform, teachers would have to be directly involved" (Lieberman, 1992: 6). Many would feel that the situation has moved on from this to a certain extent, unease about where the authority and control lies in the partnership prevail.

For some the key problem resides in the issue not being addressed overtly and openly: "tensions arise where there is a lack of common purpose and where questions of who has power, who gains and who loses are left unanswered or even unasked" (Baumfield and Butterworth, 2007:415). So for instance in the context of research partnerships where the accepted roles of both teacher and university faculty

are often challenged, forthright and forensic questions can be posed such as "What is the role of university and school faculty in the production and use of professional knowledge? Where unequal power relationships are the rule, how is equality achieved and what does that mean? Whose knowledge is of most worth or value - and to whom?" (Lieberman, 1992: 10). Ironically good intentions have been evident throughout the whole history of partnership working. As long ago as the 1980s there was "a genuine interest in seeing knowledge production as a shared responsibility of the practitioner and research communities" (Bickel and Hattrup, 1995: 36). Nevertheless it is still the case that too often teachers' knowledge feels inferior and "threatened" in comparison to what universities bring to the partnership (Cochran-Smith and Lytle, 1999; Ebbutt et al, 2000). Academic critique often characterises teacher knowledge as being intuitive by nature, with the need for such implicit, tacit knowledge to be made explicit (McIntyre, 2004).

A similar picture of partnership dynamics is painted when focusing on widening participation. Research exploring higher engagement with schools through partnership development identified the importance of universities listening in a nuanced way to the needs of schools because they vary enormously. It stressed the necessity to recognise that "each side has something to offer and to gain" citing for example: "University lecturers would benefit from schoolteachers' expertise in pedagogy with reluctant learners as well as their understanding of the context and circumstances of their pupils' families and communities" (Universities UK, 2009:16).

The recognition that, despite often good intentions, universities still tend to drive partnership direction and activity has resulted in some movement to shift power and control towards schools. Certainly this has been a feature of government policy in ITE over many decades. The latest dramatic manifestation of this has been the establishment of School Direct which "gives schools more influence over the ways teachers are trained" (Gov UK, 2014). However, this development has brought its own tensions. Although it is early days to arrive at any evidenced based judgements about the effectiveness of policy changes like School Direct there are some early concerns. Prominent among these are that it insufficiently takes account of the challenges of a school-based approach delivering the ITE system at scale, or of the reduced incentives for Faculties of Education to participate. There is also a lack of funding for schools to deliver ITE, and HEI business models that do not easily support a mixed economy of teacher training routes. These logistical concerns have been summed up in a recent comparison of teacher training developments in England with other countries:

"However, the capacity of universities to deliver the sort of high-quality teacher education that is being offered in other countries is being put at risk by a student allocation system which is making it difficult for universities to predict with any certainty how many students they will be training each year. The result is likely to be an accelerated casualisation of the teacher education workforce and a concomitant reduction in opportunities for teacher educators to engage in research and scholarship. Moreover, with funding for initial teacher education flowing from universities to schools, and a reduction in the amount of research income going into many education departments as a result of increased selectivity in the distribution of core research funding, it is possible that those university departments of Education which are not forced to close altogether will have to downsize…" (Gerwirts, 2013).

There have also been other reservations. These include the danger of schools becoming inward-looking, trainee teachers uncritically taking on the possibly poor practices of established teachers, and the ironic reflection that reifying the status of the teacher as the expert sits uncomfortably with the understanding of being an enquirer and lifelong learner: "Expertise implies certainty and state-of-the-art practice. Lifelong learning, on the other hand, implies tentativeness and practice that is sensitive to particular and local histories, cultures, and communities" (Cochran-Smith and Lytle, 2009:294).

An alternative and more measured approach is to avoid this power and control pendulum swing between universities and schools. Instead there would be a striving towards a genuinely shared approach which, for instance, creates "an environment in which it was possible to develop new research relationships across a range of partners, rather than merely transfer the locus of research (from universities) to schools" (Simons et al., 2003:350). The emphasis is thus on "*all voices being heard*" and development of a partnership culture based on sharing and valuing differences (Baumfield, 2001; Taylor, 2008). Much of the literature takes us in this direction of a mature view of partnering based on recognition of the value of all community contributions (including, for instance parents), of mutuality and a dynamic often risky arena, distinctive from either the school or the university. This lies very much at the heart of the concept of developing "enhanced partnerships" modelled by the HEFCE funded development in Bristol (Richie et al, 2011. This report built on local experiences to give case studies organised around the engagement areas of Governance; Leadership, Direct support for students; Student progression

and transition to HE; and Curriculum development). Thus partnership is seen as "a complex and fuzzy process" where the views and contributions are "valued and treated as equal, perceived not as barriers but differences that stimulate change in others" (Taylor, 2008:84).

The implications are considerable. It contests knowledge hierarchies, embraces multiple kinds of knowledge and expertise, and calls for a "new generation of university researchers who, because of a participatory and inclusive stance, refuse to go into schools as authorities, ignorant of the importance of teacher-generated knowledge for education" (Arhar et al , 2013:233). Above all, it involves a radical challenge to cultural norms of both universities and schools, as we shall now go on to consider.

Mind the gap – cultural differences

The literature is awash with observation upon the chalk and cheese nature of respective university and school cultures. Richmond (1996) argues that the challenge to achieve a mutually beneficial partnership between the two cultures "is to understand the culture of the various partners and to foster a sense of belonging, regardless of the cultures involved" (1996: 217). In previous reviews of the research, particularly related to ITE, the academic and the school teacher were portrayed as having fundamentally different outlooks. Academics' approach to teaching drew on the four principles *of their own classroom experiences in schools and universities, research into classrooms, interaction with academic colleagues,* and *knowledge of the literature.* Whereas school teachers shared their craft knowledge of the following four key aspects: *classroom interactions, student development, teaching resources,* and *school procedures* (Smedley, 2001:189). With regard to school/university research collaborations, the partners have long been characterised as almost inhabiting different planets: "The differences [between researchers and practitioners] include a tendency to live in two different professional communities, or 'worlds'; distinctive cognitive styles; responsiveness to divergent rewards; and different beliefs about how knowledge can best contribute to human welfare" (Glaser, Abelson, and Garrison,1983:1).

The considerable contrast between these two worlds is conveyed powerfully by Ebbutt et al (2000), ranging across stark differences in outlook on, for instance, knowledge, audience, accountability and even mismatches in the different pace and scheduling of the working year. This extends to the fundamental issue of communication - teaching does not have a specialised technical language whereas academic educationalists and researchers do. The academic's attention to language precision and purity of research approach and methodology can to the practitioner's perspective seem "over-indulgent-reflection-that-paralyses-action" and "agonisingly lengthy and not always particularly productive". Whilst from the viewpoint of a university researcher, "interactions with teacher researchers can sometimes feel casual, unprepared, impatient, rushed, brusque, tokenistic and anxious for rapid closure" (Ebbutt et al, 2000:329&330). (At the same time, there is a danger, of course, of reducing the complexity of such relationships and cultural clashes to a caricature portrayal and this review will go on to acknowledge the positive reciprocal benefits to be gained from school-university partnerships. These include research by OECD and others in Finland which indicates that an HE-led model can be an important and successful foundation for school and system performance, OECD, 2003).

Similar tensions between the two cultures are in evidence in work on widening participation and STEM. A common problem described is the tendency for such activity to be framed as time-limited initiatives and insufficiently related to the institution's core purpose, priorities and values. Callahan and Martin (2007) argue that because purposes differ, there is unlikely to be a single "right way" to establish and sustain a partnership. This is identified particularly with respect to universities and there have been many calls for a more strategic approach to engagement, ensuring alignment with overall missions and viewing engagement as a process over extended timescales: "Projects work best when relationships are developed over time, are strategic and support the missions of universities, colleges and schools involved in a targeted way" (Craddock and Dodgson, 2009:6; also Sutton Trust, 2008). This imperative for joined-up coherence and "strategic fit" – both between the engagement activity and the universities strategic priorities; and between the values, aims, objectives of the school(s) and the university – are overwhelmingly reiterated across the eleven HEFCE funded partnerships (HEFCE, 2010). In this sense, partnerships are joint enterprises. The direction, growth and sustainability of the enterprise is determined by not only the efficiency of the formal organisational arrangements (i.e. **structure**), but also the nature of the **relationships** and the "strategic fitness" of the **interventions** (Day et al., 2010).

Intriguingly a rather different perspective is given by Huxham and Vangen (2005). They maintain that "collaborative advantage" can be gained when the primary objective of the partnership is one that is of concern to all partners but of central focus to none (see also Kanter, 1994). So, here there is the notion that the aims that bring organisations together should not be central to their mainstream business,

and only within the partnership is space created to pursue them. The emphasis is therefore less on each party committing to the partnership because it helps to fulfil part of its own organisation's core concerns. Instead it is on bringing parties together in a particular construct to create priorities generated by the partnership that neither could fulfil individually. As Cochran-Smith and Lytle (1992) explain, it's about fashioning "mutually-constructed learning communities [resulting in] opportunities that are both different from and richer than the opportunities either the school or the university can provide alone" (Cochran-Smith, 1992, p. 109).

This is a significant and pervasive concept in the literature. It emphasises the partnership as a special, distinctive arena with its own dynamics. We see this reflected in descriptions of the "irregular heartbeat of the partnership organisation" (Baumfield and Butterworth, 2007:415) in which participants must be prepared to act outside their current area of expertise and tolerate a degree of ambiguity, as precise outcomes cannot always be predicted (Baumfield, 2001). So in committing to the partnership there is a sense of uncertainty, of risk, of operating outside one's comfort zone - but at the same time it is a vibrant, creative space which may offer up potentially great dividends. Miller's conception is often cited to characterise this environment of mutuality: 'A school/university partnership is a precarious organisation. Bridging two cultures, it remains marginal to each. This marginalisation, though difficult to manage, is essential for survival'. (Miller 2001: 116). The reports on widening participation partnerships portray this in terms of the creation of a *"third space"* outside any of the institutional partners, where the focus is on the agreed objectives of the partnership, with freedom to share ideas, knowledge and resources, and to develop flexible, innovative approaches to entrenched issues (HEA, 2012:9).

This concept of *third space*, or precarious organisation, has been compelling and very prevalent in research into partnerships on both sides of the Atlantic. It is characterised as a "hybrid" space that not only draws on the knowledge and discourses of two distinct communities (whether they be school and university, or home/community and formal institutions), but also facilitates them: "In *third space*, then, what seems to be oppositional categories can actually work together to generate new knowledges, new discourses, and new forms of literacy" (Moje et al, 2004). Like Baumfield and Butterworth (2007), Arhar et al (2013) also point to a helpful sense of marginality and "ambiguity" in effective partnership working. In their research into how teacher research could serve as a vehicle for bridging the cultural gap between schools and universities they found that such spaces brought about a creative vulnerability and transparency. "Vulnerability, whether intentional or situational, has the potential to build trust when it is embraced. By being vulnerable, teachers opened a *third space* where authentic dialogue could occur." They conclude, with Cochran-Smith and Lytle (2009), that "the stance of 'transparency and vulnerability' appears to be a tool for bridging the university/school divide" (Arhar et al, 2013:227&228). In turn, such "authentic dialogue" can only thrive on trust – a condition and resource which is not a given but a process that requires mutual effort, investment and commitment from all parties involved:

> "Trust is established through a commitment period during which each partner has the opportunity to signal to the other a willingness to accept personal risk and not to exploit the vulnerability of the other for personal gain… As participants begin to feel more comfortable with one another, there may be a tacit testing of the limits of trust and influence and attempts to arrive at a mutual set of expectations".
>
> (Tschannen-Moran, 2004: 42)

So, the aspiration to create a dynamic *third space* where the principles of co-development and mutuality reign is certainly an alluring one. However, it sets high expectations and raises significant implications. Is it simply a well-intentioned ideal? How can it be achieved in practice? Are there approaches or models that help to create such a partnership environment? These questions are considered further in the next section on outcomes, but for now it is helpful to conclude with some reflections on leadership.

The pivotal contribution of leadership

Perhaps unsurprisingly, leadership is identified as being a key factor in ensuring coherence and success in such vibrant and volatile partnership environments. "Leadership is a priority – we want leaders at all levels to be able to share and learn from each other's' experience, and to form partnerships that reflect their particular priorities and needs" (NCEE, 2008:14). Some recent commentators have been adamant in stating that partnerships and networks are not naturally self-organising. They require leaders to help establish the vision and modus operandi of the enterprise:

"A small number of opinion leaders played a critical role in building followership and securing moral authority for organizing the rules of the game. Each, with their own style, evangelized the vision, set goals for the collective project, persuaded others of its viability and invited participation" (Bryk, Gomez and Grunow, 2011:32).

Whilst some stress that effective collaboration requires shared leadership (Bickel and Hattrup 1995), others have found that distributed leadership in partnerships is complex and challenging. The literature indicates that the relationship between universities and schools can be seen too simplistically and that "a micropolitical perspective is a useful way to view such partnerships" (Firestone and Fisler, 2002:450). Such micropolitical perspectives can highlight divergent interests and conflict, although conflict does not need to dominate (Wallace, 2000). What appears to be central to ensuring coherence and the effectiveness of collaborative leadership is a degree of consensus about the fundamental nature of the exercise. In their eight year exploration of one university partnership Firestone and Fisler found that "one of the recurring problems in schools (and in partnerships like these) is building a shared understanding of the common good. Without such shared understanding, distributed leadership can easily become dispersed leadership with the chaos, isolation, or conflict that may follow" (Firestone and Fisler, 2002:451).

A crucial feature in partnership leadership is how this operates across the boundaries between the partners and the pivotal function carried out by key roles. This is emphasised in all contexts of partnership working - in ITE and research collaborations and also in widening participation developments. So, for instance it can take the form of teacher research coordinators operating across and between schools and universities (McLaughlin & Black-Hawkins, 2006), or the role of "the 'blended professionals' who work across institutional boundaries – who facilitated the work of the partnership" in widening access and student retention initiatives (HEA, 2012:9). The overriding message is that "people in formal boundary-spanning roles have special potential" (Firestone and Fisler, 2002:451).

These leaders at the interface between the two institutions are often recruited from schools, who then acquire academic expertise, in order to address concerns about partnerships being university driven. This experience can be a powerful professional development for the individuals involved, but it also raises issues of the time span over which they can go "academically native" and lose their school-based credibility. Interestingly, in Australian research into distributed leadership within a school-university partnership a more nuanced and bespoke picture emerged with leadership bubbling up pragmatically where it was needed: "… leadership appeared where it was most required, such as: expertise in one or more of the STEM discipline areas; expertise in facilitating classroom teaching practices and managing students' learning at appropriate levels; and expertise at resource selection, data collection and record keeping" (Hudson et al, 2012:782).

Section 3: Features and outcomes of effective partnerships

"To believe in partnerships is one thing. To make them really happen takes time, great skill and above all great courage and generosity on the part of those who currently hold the power" (Koop, 1995:9).

"Successful partnerships provide new and established teachers with the opportunity to combine hands-on experience in the classroom with space for the reflection and discussion that transform this experience into learning" (Jerome, Aktan, de Sousa and Verkewst, 2011:10).

"The community needs to build on the knowledge that it is generating from its experience – that is, it needs to become a learning community" (Falk, Osbourne, Dierking, Dawson, Wenger, and Wong 2012:7).

Benefits and outcomes

The quotes at the beginning of this section set the context of the considerable expectation being placed on school-university partnerships. Desired outcomes are often ambitious. They range from dramatic increases in underrepresented minorities upon university programmes (Jones et al, 2002) to transforming improvement across the school system (Matthews and Berwick, 2013). The HEFCE-funded study into partnerships carried out by Nottingham University identified a whole range of benefits they provided for schools, pupils, the community and the university. These included: raising aspirations and achievement and providing opportunities for teachers to draw on external expertise and for school-based collaborative research (*schools*); enrichment activities; access to resources; and opportunities to make informed choices about the future (*pupils*); increased interaction between members of the university and the community; and engaging the community in educational activities (*community*); meeting the university's social justice goals; creating opportunities for research; staff and student professional and personal development; and economies of scale collaboration with other local institutions (*universities*) (Day, Gu, McIntyre, Brown and Curtis, 2010:ix).

Nevertheless it is significant that often such gains are rather loosely characterised in terms of broad benefits, rather than specific outcomes. These partnerships pose significant challenges to the culture and organisational arrangements of the partners and, if there are to be robust and meaningful, set demanding outcomes. In short, collaboration has its costs: "Our contention is that organisations cannot afford to avoid collaboration but, also, that organisations cannot afford collaboration without purpose and efficiency" (Hay Group, 2000:2). Hargreaves (2011) observes that "partnership can easily become a soft, warm and cuddly process of unchallenging relationships between professionals to achieve some modest outcome." He concludes that as well as benefits, partnerships also have "transaction costs - the time, energy and resources necessary to keep the partnership alive and well" (Hargreaves 2011:22).

So, in this section we explore the features, benefits and outcomes of school-university partnerships – related to the whole spectrum of activity, from ITE to widening participation. There will be examination of the conditions needed for partnering such as skills, dispositions and relationships, and the issues of time and sustainability. It will also include tackling challenging questions like to what extent can the aspiration of mutuality be actually achieved and what is practically entailed in creating a *third space* partnership culture? The section concludes with some outline discussion of potential approaches and models.

This review has shown how partnership has been characterised as both a complex and fussy process (Taylor, 2008). Interestingly Firestone and Fisler (2002) reflect that although the term "partnership" may suggest ultimate outcomes, this is not necessarily a prerequisite, and they refer back to the core features in the Goodlad (1988) definition of a deliberately designed, collaborative arrangement between different institutions (which in turn raises the interesting question of possible successful outcomes emerging from partnership which have been "accidentally" formed). Similarly Bickel and Hattrup, reflecting on their STEM research, state that "both the participating teachers and researchers were committed to improving mathematics instruction … just as a shared purpose does not guarantee efficient, productive, collaborative processes, a worthwhile cause does not guarantee continuing commitment on the part of the participating parties" (Bickel and Hattrup, 1995: 44).

There has also been a lively debate about the extent to which partnership outcomes can be set and actioned in terms of central policy intentions when, as we have seen, the dynamics of effective partnering tend to be determined at the local level. Sedon, Billett and Clemans (2005) observe that "Partnerships,

their character and consequences, are forged at the contested interface between localised networks and central agencies, and they are framed by the broader relations that play through partnerships as well as between partnerships and the wider political order. Like schools, partnerships are sites of struggle" (2005: 582). Thus whilst policies can help to support and enable outcomes in a general way, such characteristics as will, motivation, and commitment were locally defined and largely beyond the reach of policy (McLaughlin, 1987:124). Indeed, policy dictated outcomes can even prove counterproductive with "restrictive and prescriptive policies, unrelated to the specifics of culture and context... attempting to achieve quick fixes rather than comprehensive change" (Lieberman, 1992:7). By contrast, as we shall see, meaningful and potent outcomes are more likely when they are conceived and achieved as part of the partnering process itself. As Taylor discovered, in such a partnership atmosphere "all partners are perceived to benefit by extending their own understanding of the principles and practices of teaching and learning" (2008:79).

Conditions for collaboration

The opening section of this review showed that, although long heralded, it is only in comparatively recent times that collaboration has been embedded as a major policy thrust in the schools sector – both between schools and universities, and between schools themselves. This is particularly evident in the establishment of Teaching Schools. A great deal is being expected of Teaching Schools to "lead and develop sustainable approaches to teacher development" (DfE, 2010a: 23) not just in individual schools but also in terms of improvement across the education system (Hargreaves, 2012). This has led to much attention being devoted to the conditions needed for this to happen; for example:

"The concept of teaching schools depends on four conditions being met: firstly, identifying best practices in teaching and learning; secondly, providing a structure in which to share these practices – and knowledge about good practice; thirdly, ensuring that teachers and school leaders have the skills and confidence to share and deploy best practices, and, fourthly, a climate in which there is a practical and moral incentive to share best practices between schools" (Husbands 2013:3).

Much of the recent literature on successful research partnerships points to a common set of conditions which comprise "the importance of shared leadership, shared goals, development of social and intellectual skills needed for collaborative work, and adequate time" (Arhar at al., 2013:219). Decades beforehand this was echoed in the very early research into school-university partnerships which cited the following list pre-requisites for success: the presence of an organizational structure, a core group of people actually working on the collaboration, a commitment of significant amounts of time and energy, flexibility, an understanding of how "the other organization" works, determination to learn from inevitable conflicts and a desire to work together on something (albeit perhaps for different reasons), and a shared sense of trust and pride in the outcomes of the collaboration (Lieberman, 1986:7).

There are a number of features recurring across these lists. These include the need for school and university staff to have/develop *certain skills, disposition and outlook.* So, for instance Bickel and Harrup (1995:44) found that "teachers who were most comfortable and able to participate in the collaboration drew on a wide range of social and intellectual skills, knowledge bases, and attitudes in their interactions with researchers." Across the range of school-university partnership activity all parties tended to have a common mind set. All partners were involved in student-focused interaction and "perceived to benefit by extending their own understanding of the principles and practices of teaching and learning" (Taylor, 2008:79). Indeed, in her earlier review Smedley concludes "the literature has started to acknowledge that it is the attitudes and dispositions of the individuals within the partnerships that will ultimately dictate the level of success" (Smedley, 2001:201).

Above all *the nature and quality of relationships* between the partners was found to be crucial. There was a need to build mutual respect, trust and a sense of being valued so that relationships can develop as the partnership itself evolves: "Sharing common understandings and values is important, as is acknowledging and respecting differences in perspectives" (McLaughlin and Black-Hawkins, 2006:279). In their HEFCE-funded research on school-university partnerships, Day et al. (2010) also found that for partnerships to be mutually beneficial to all parties involved, it is particularly important that those in HE learn to act in different ways, "to converse in new languages and to listen to different voices" (Day, 1991: 69). They concluded, with Hargreaves and Fink (2006), that sustainable partnerships must be built upon the premise that trust matters because "In relationships and organisations, trust amounts to people being able to rely on each other, so that their world and relationships have coherence and continuity. ... It creates and consolidates energy, commitment and relationships" (Hargreaves and Fink, 2006: 212-3). Indeed, this focus on establishing secure relationship foundations has been fundamental

in the thinking of those who have pioneered the Teaching School movement: "The success of the teaching schools policy is likely to rest as much on the quality of the partnerships and the trust, co-operation and communication that are as essential to buy-in from other schools as on the quality of the teaching schools themselves" (Matthews and Berwick, 2013:5). The early development of 18 teaching school alliances supports Matthews and Berwick's observation: "the building of person-to-person and school-to-school relationships permeates the everyday leadership work of teaching schools and their alliances. The benefit of such relationships is that they provide both the conditions and the necessary social basis for communities of learning, and through these, for joint practice development to take root within the alliance" (Gu et al., 2014: 26).

Other key features emphasised throughout the research are the linked issues *of time and sustainability.* Just as relationships are fundamental to securing successful partnership outcomes so, in turn, investing sufficient time to the partnership is vital in establishing such relationships. Again and again this is the clarion call that echoes down the years in the literature. So we hear that:

"Time is a critical resource in the development of sound collaborations, and leadership tends to underestimate how much time is needed" (Bickel and Harrup, 1995:50).

"The partnership demands a high level of flexibility and this requires a commitment to spending time on fostering and sustaining the personal relationships that enable the partnership to prosper" (Beaumfield and Butterworth, 2007:414).

"The reports are not uncritical of the work of the partnerships. They identify constraints and issues that include… the difficulty of securing sustained engagement from key partner institutions and the need to acknowledge the time and work required for partnerships" (HEA, 2012:9-10).

This is perhaps best illustrated in the case study of a ten year partnership between a university and a school which demonstrates in impressive detail how such a relationship can be enriched and revitalised through all the changing pressures and demands on both parties in the volatile world of education. Prioritising the partnership and investing time were again the key factors:

"Negotiation was therefore essential and depended crucially on mutual understanding of different needs and purposes, and willingness to give and take criticism as part of the development process. Possibly this kind of open relationship, which is inevitably personal as well as professional, can only be achieved over a considerable period of time" (James and Worrall, 2000:95).

Associated with the demand for time is the need for policy and funding support. Without it, many school-university partnerships have almost ceased to exist. The powerful message is that achieving a longstanding relationship is an immense challenge. Simply having a common cause that all parties believe in is not, in itself, sufficient: "It is difficult to attract and maintain researchers' and teachers' interest and involvement in collaboration over time, even when the cause is one that is perceived to be highly salient to contemporary educational reform needs" (Bickel and Harrup, 1995:44). It appears there needs additionally to be a conscious, overt discipline to devote time and energy to the enterprise, setting goals over a sustained period (Smedley, 2001:195). Interestingly, a similar picture is painted in the literature about collaboration in the world of business where it was found that lack of ongoing commitment to the alliance by either party would derail it (Gonzalez, 2001:51). Put starkly, the relationship needs to be prioritised, worked at, and invested in for the duration.

Mutuality - powerful myth or practical proposition?

Section two explored the very strong emphasis in the literature on the importance of mutuality in school-university partnerships. This is founded on the notion of creating a distinct partnership culture, a *third space*, outside the respective partner institutions in which mutual approaches can be grown and innovation can thrive. The power of this conception is that the differences between schools and universities are seen as a source of creative tension rather than discord. It is characterised as a "precarious organisation" where there is a sense of "ambiguity" and of "constant flux" (Miller, 2001; Arhar, 2013), but that this "state of ambiguity as new roles and relationships are negotiated is an essential stage in the development of genuine mutuality when working in school–university partnerships" (Baumfield and Butterworth, 2007:423). However, to what extent is this an idealistic vision, a partnership image based on wishful thinking, a well-meaning egalitarian aspiration? What are the implications for achieving this in practice?

Well, the literature makes some attempt to suggest possible approaches. One key element is to put in place arrangements by which school and university colleagues *work together on specific developments* and to support this activity with *joint professional development*. This helps to ensure that there is mutual learning and the "partnership involves learning from – and with – others and is a values approach of mutual benefit, mutual esteem, and shared responsibility" (Taylor, 2008:84). This echoes some of the thinking about effective collaborative strategies to achieve a culture of mutuality, by others in the world of education and other arenas.

So for instance, in considering what drives partnering, Baumfield and Butterworth describe the process of learning in school–university partnerships as taking place across a permeable membrane in a process analogous to osmosis. What promotes and drives exchange of understanding and learning across the membrane between partners is *enquiry*; "as problems are posed and solutions sought then expertise is located in different people and in different places within the partnership." Equity in the relationship lies in "the mutual interest created by the project context which sets conditions, creates opportunities and limitations to which all the partners are subject." Specific tools can be the catalyst for the enquiry and generate a virtuous circle of finding answers to particular challenges and a "warrant for further action and enquiry" (Baumfield and Butterworth 2007:422-423). A similar approach, comprising such overt collaborative enquiry with the locus on problem solving, is indicated in the business and health sector literature (Gonzalez, 2001; Matthews and Berwick, 2013). The following discussion considers further the potential of adopting *a problem-solving orientation,* with reference to examples of particular approaches/models and the importance of putting in place formative and summative evaluation of partnering activity.

Crafting local solutions and community partnering

The concept of partnerships inhabiting a creative *third space*, distinctive from the partners' individual institutions is intimately bound up with *localism* and, in particular, a sense of a coming together to jointly address problems and craft local solutions. It is thus a "generative space, where 'deepening the local' and 'linking across locals' go hand in hand" (Arhar et al, 2013:233 and Cochran-Smith and Lytle, 2009:154). So with this understanding the debate about power and control lying with the university or schools is shifted to a focus on the outcomes for those the partnership is there to serve – to children, teachers and the local community. It can even help these groups reconnect with and own the learning process, as Durrant has explored in her recent research into how a university working with schools can empower stakeholders as agents of change:

"An agentic perspective may serve to 'rehabilitate the concept of authenticity' in schooling. This extends beyond teachers to children and young people, and ripples outwards into families and communities. It builds trust and encourages not so much independent learning, as interdependence" (Durrant, 2014:59).

Significantly, this emphasises that school-university partnerships may have an extended membership from the wider community, with, in particular, the contribution of parents seen as crucial in achieving widening participation outcomes: "Involving parents in plans for partnership working is important, particularly in relation to the preparation for university and in terms of widening participation activity and raising aspirations for younger people" (Universities UK, 2009: 16). Similarly, in their review of the literature in the USA, Miller and Hafner (2008) consider university/school links in the broader context of partnership with the local community. They observe that there have been strong demands for universities to collaborate with the 'community' through "service-learning classes, university–school partnerships, literacy training programs, neighbourhood clean-up initiatives, job training programs, family health services, and tutoring services" (Miller and Hafner, 2008:68).

So viewed from this perspective the concept of mutuality is not necessarily bound up with a vague notion of an egalitarian state of affairs with neither university nor school in the driving seat. Instead it has a focus on a vibrant alliance of partners within a local community context, where leadership steps up to the plate as and when it is required and where specific developments need to be taken forward - and is thus carried out by whichever partner is appropriate (see previous section on leadership and in particular Hudson et al, 2012).

Indeed, considering approaches to partnering in the wider community context beyond education can provide some helpful insights into local solution orientated models. The example of the Health service is often cited in this context. The Government has sought to raise standards by "giving outstanding schools a much greater role in teacher training in the same way that our best hospitals train new doctors and

nurses" through developing "a national network of Teaching Schools on the model of teaching hospitals" (DfE, 2010b:3&9). The architects of the Teaching School concept note that teaching hospitals have a strong commitment to training and research, alongside and through the medical services they provide: "They are the centres for vocational (i.e. clinical) training of medical professionals, working very closely with the university medical schools that provide pre-clinical training and support research" (Matthews and Berwick, 2013:9). Despite this considerable advocacy for teaching schools to be modelled on teaching hospital there is a need to be cautious when comparing the two. There are not only distinctions between how teachers and doctors are trained but also in terms of how research is conducted and used, with significant differences in cultural practice, such as doctors having research leave, a concept almost alien to the teaching profession.

Nevertheless, Matthews and Berwick draw attention to the fact that over 80 per cent of medical schools in the USA have some problem-based learning in their programmes and this focus on solutions orientated approaches is at the heart of thinking about design-led partnerships, also stemming from North America. This will now be explored further along with other possible models for school-university partnerships.

Design-led partnerships and problem solving models

"…most assessments conclude that the R&D enterprise has not helped as much to date as one might hope and expect. A small but growing cadre of scholars and policy organizations have coalesced around an argument that the social organization of the research infrastructure is badly broken and a very different alternative is needed" (Bryke, Gomez and Grunow, 2011:3).

This stark statement highlights the perception of a fundamental disconnect between the intentions of researchers and the actual outcomes achieved. There is a persisting view that educational research has not sufficiently delivered in terms of benefits within the classroom. This is accompanied by judgement that the cultural clashes described in the second section of this review have limited the effectiveness of partnership working. These concerns have prevailed in the literature across the years. The alarms sounded in the 1990s about the limited usefulness of academic research and the need for practitioners to be more effectively involved (Hargreaves, 1996; Hillage et al, 1998) are being echoed decades later: "Traditionally in educational research despite a great deal of effort by a lot of great people the research in academia has not been able to make its way into classrooms" (Johnson, 2013: video extract). This is a frustration that is not just felt by university academics but is also a feature of teachers and university staff now aiming to work together with a good will to make a difference. The outcomes of their collaboration too often lead to a sense of disappointment and missed goals:

"Both researchers and practitioners struggle with problems of implementation. Researchers design tools which they hope will be implemented well and they are often disappointed by that. And education leaders are often vexed by implementation problems. They adopt a new curriculum and it doesn't get the results they hope" (Penuel, 2013a: video extract).

These concerns have led to attempts to frame models which help to ensure partnering activity has focus and impact, and we will explore briefly some examples of these.

Bryke, Gomez and Grunow (2011) base their model on practitioners and university partners simultaneously being engaged in *local problem solving*. They argue for "a more problem-centered approach that joins academic research, clinical practice and commercial expertise in sustained programs of Design-Educational Engineering and Development (DEED)" (Bryke, Gomez and Grunow, 2011:4). This in essence seeks answers to three "seemingly straightforward questions" - what problem(s) are we trying to solve?; whose expertise is needed to solve these problems?; and what are the social arrangements that will enable this work? The view is that when the answers to these fundamental questions are disorganised this naturally results in failure to make progress on core concerns.

At the heart of this model is the adopting of a *design-led approach to partnership working*. This is also reflected in the work of Penuel and colleagues. Their "Research + Practice Collaboratory" aims to "address the gap between research and practice in STEM education, across both formal and informal settings" (Penuel and Gallaher, 2014:3). As with Bryke et al, it is crucial that the problems research-practice partnerships address are jointly negotiated because:

- Neither researchers' nor practitioners' initial ideas about the problem are a sufficient basis for partnership

- Each stakeholder is likely to have a different perspective on what's important, depending on their role

- Joint negotiation benefits from systematic analysis

> (Penuel and Gallaher, 2014:7)

All such approaches recognise that the problems being tackled, and the nature of the partnering used to address them, are *complex and composed of multiple strands.* Making headway involves understanding that these multiple stranded problems have within them numerous embedded micro-level problems that play out over time and often interact with one another. Significant progress depends on effectively addressing this interaction: "Small gains may be possible by focusing on single elements, but dramatic change ultimately requires a systems view of how these elements (and others) interlock to create the overall outcomes currently observed" (Bryke, Gomez and Grunow, 2011:9). This reflects the micro political climate of partnerships and their leadership discussed earlier and the issue of dealing with surfacing *tensions and conflicts*. "Differences in institutional cultures are bound to produce conflict in sustained, substantive collaborations" and it is critical that they are sensitive to these and that a problem-solving spirit is brought to bear when conflicts occur (Bickel and Hattrup, 1995:53&54). The very nature of partnership activity is that it takes place in a volatile political environment and that it inevitably produces new dilemmas and problems of practice. Thus, partnerships develop in changing contexts – changing policy environment, changing funding environment and indeed changing people (Penuel and Gallaher, 2013).

We have seen the importance placed on local knowledge in the current and the previous section of this review. However there are concerns raised about the nature of local knowledge in terms of *scaling up* to draw wider implications and inform system change. Decentralised, partnership working is potent but the knowledge generated can be embedded in the local situation; as von Hippel (2005) argues, "the problem-solving work of innovation requires access to 'sticky' information regarding user needs and the context of use." This knowledge is therefore highly localized and can be costly to transfer, and improving at scale requires coping productively with local diversity. So Bryk et al. contend that we need much better access to this sticky local knowledge and call for a design-led collaboration "which explicitly aims to function in the hands of diverse individuals working in highly varied circumstances". They see this being delivered through a *network organizational approach* that "can surface and test new insights and enable more fluid exchanges across contexts and traditional institutional boundaries - thus holding potential to enhance designing for scale" Bryk et al (2011:6). So to build on local knowledge and to improve practice, partnership teams need to commit to iterative, collaborative design. It is suggested that this comprises the following elements:

- The aim of design is to improve teaching and learning practice, at scale

- The objects of design are not only curricula and programs they also include the professional development and other supports needed to implement curricula and programs with integrity

- Design process should allow teams to "get things basically right fast" and/or "fail early and fail often."

- Design process should be participatory, involving as many stakeholder groups as is feasible

> (Penuel, 2013b:1)

Central to this design-led process are a firm *commitment to genuine collaboration,* together with putting in place *practical arrangements* to make it happen and *investment in evaluation* to measure outcomes and impact. So, for instance, Penuel's Design Based Implementation Research insists on "joint engagement of researchers and practitioners at those moments of design implementation and sustainability" (Penuel, 2013a: video extract). The partnership should clearly "document the ways participation in this process was structured to include district and school leaders, teachers, parents, community stakeholders, and, wherever possible, children and youth" (Gutierrez and Penuel 2014:20). It should also establish robust routines and practices for:

- Periodically reviewing the focal problems

- Collaborative design

- Managing and reviewing progress of the partnership itself

> (Penuel and Gallaher, 2013:11)

This sense of collaborative clarity and rigor is also the watchword of Bryk et al's networked design communities approach, and is founded on a protocol of four core questions:

- How do we understand the presenting problem, including the organisational systems in which it is embedded?

- What precisely are we trying to accomplish (meaning what are the targets for the improvement research)?

- What changes might we introduce toward these ends?

- How will we know if these changes are an improvement?

> (Bryk et al, 2011:26)

The last of these bullets is particularly important. One of the significant challenges made of school-university research partnerships is that they invest insufficient time and energy into evaluating just what difference they are making. Asking the fundamental impact question is at the heart of many of the approaches and models that have been developed. This may have substantial professional development implications as in many design-research partnerships staff "may need to learn how to develop measures, collect data, and participate in structured approaches to design and development" (Coburn, Penuel, and Geil, 2013:24). This evaluation rigour needs to be clearly focussed on the substantive outcomes from the partnership, but it also needs to be applied to the reviewing and renewing the partnership itself. This involves establishing strong strategies for not only "bridging" across cultural divides, but also moving ever closer to a "bonding" of participants together in order to create a closer and more profound sense of partnership identity (see Baumfield and Butterworth, 2007:423-424).

A concluding reflection: More for less... or costly indulgence?

"The challenge for education systems around the world, regardless of their current situations, can be expressed this way: Bringing more students than ever before to higher levels of achievement than ever before, on a broader range of skills and attributes than ever before, with less inequity in outcomes than ever before" (Levin, 2012:11).

Faced with this daunting imperative Governments across the world have turned increasingly to partnership working and collaboration. Rather than seek to impose central solutions, the growing emphasis has been on looking to educational organisations themselves to mine their own experience, expertise and local knowledge to bring about the system-wide improvement needed. Collaborative approaches like school-university partnerships have been so alluring because they are seen as being cost effective, particularly in these austere cash-strapped times:

"Partnerships, collaborations and networks are popular with policy makers as they can be a means of delivering more with less by making better use of existing resources and adding value by bringing together complementary services; they can also foster innovation and synergy and be emancipatory in the formation of new relationships and systems of working" (Baumfield and Butterworth, 2007:415-416).

Nevertheless, as this review has demonstrated, there are some significant cautionary notes to sound. Prominent among these is the danger of such partnerships being well-meaning but ill-focussed and poorly-coordinated; costly but lacking in bite; time consuming but unproductive. School-university partnerships have much potential but there are a number of simple but fundamental tenets that are emphasised throughout the literature:

Building and sustaining productive partnerships is very difficult. Successful partnerships are **tenaciously resilient** in an ever changing policy and system environment. They require **commitment** which is regularly rededicated, **a purpose** which is often reaffirmed, and **an identity and dynamic** which are continually replenished. Partnerships depend on the **adherence and obligation** of their members; they thrive on **trust** and the continuing housekeeping attention that partners **invest** in them.

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