About learning

Report of
the Learning Working Group

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We connect researchers, thinkers and practitioners to an international network of people changing politics. Our ideas regularly influence government policy, but we also work with companies, NGOs, colleges and professional bodies.

About us

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Introduction

In June 2004 the Minister for School Standards, David Miliband, commissioned the authors of this report to consider the issue of learning. The project was managed by Demos.

Terms of Reference for the Learning Working Group

1 to explore the development of a working vocabulary for practitioners and policymakers around the concept of learning for pupils of school age, taking account of the latest advances in research and in practice.

2 to clarify the concept of learning to learn, and to:

  o elucidate the link to learning in a more general sense;

  o explore its components and associated ideas and practices;

  o advise on how the evidence might be evaluated;

  o suggest how demonstrating progression in this area might be developed;

  o advise on how good practice in this field might be judged and identified.

3 to advise on the implications of the above for the policy and the practice of personalised learning.

4 to consult, as appropriate, with relevant individuals, groups and organisations on these tasks.

Membership of the Learning Working Group

The group comprised seven members:

three head teachers

Jackie Beere, head teacher
Campion School, Northamptonshire

Maggie Swindells, head teacher
Gorsey Bank Primary School, Cheshire

Derek Wise, head teacher
Cramlington Community High School, Northumberland

three cognitive scientists

Charles Desforges, Emeritus Professor of Education
University of Exeter

Usha Goswami, Professor of Education and Director
Centre for Neuroscience in Education,
University of Cambridge

David Wood, Professor of Psychology and Director,
Learning Sciences Research Institute
University of Nottingham

and a chairman

David Hargreaves, Fellow of Wolfson College
Cambridge.

The Demos team were **Matthew Horne**, senior researcher, and **Hannah Lownsbrough**, researcher.

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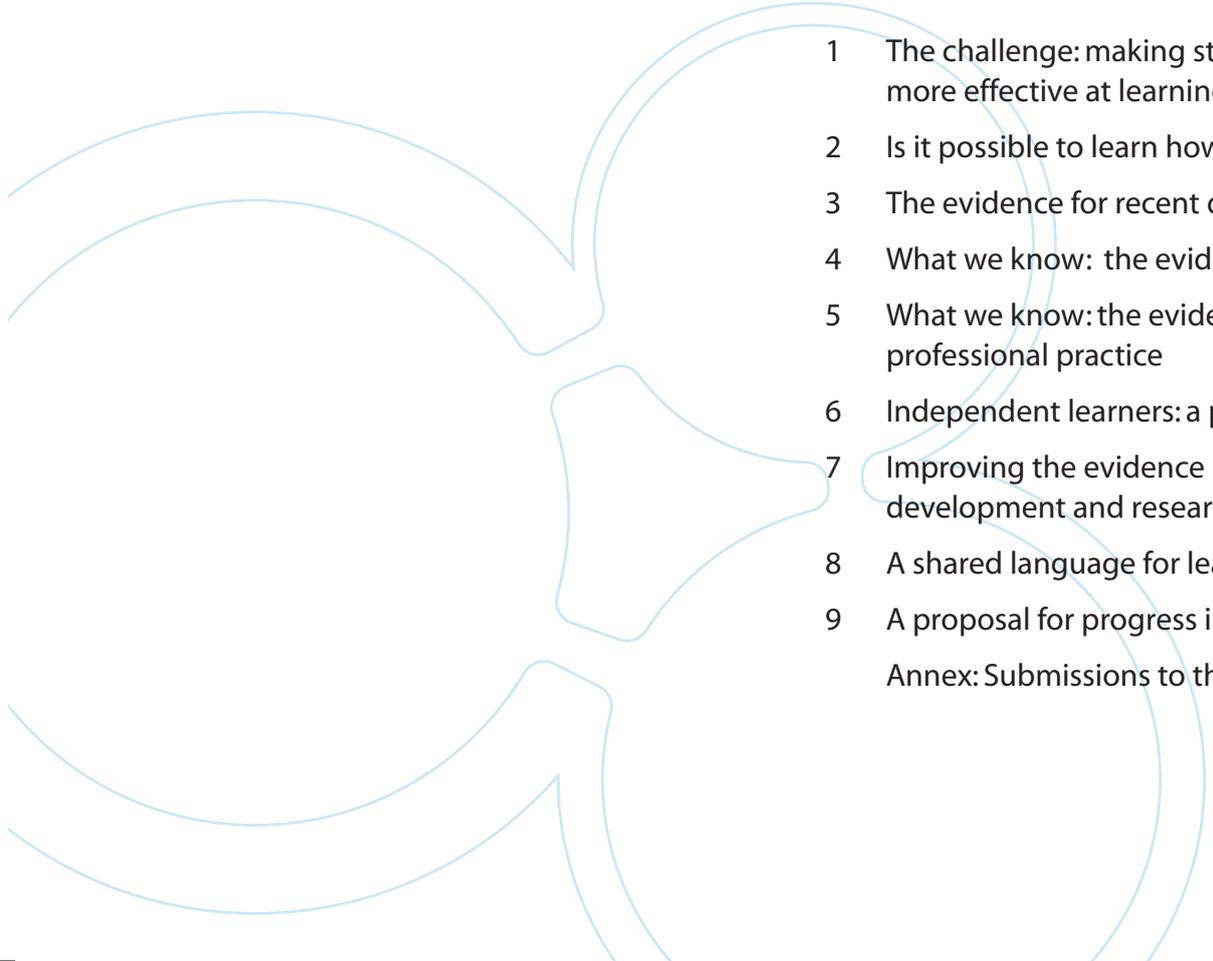
1 The challenge: making students more effective at learning

Teachers are passionate about devising better ways in which their students might become more effective learners. Within the scientific community there is excitement at the rapid advances being made in how learning is understood. This conjunction of interest in learning provides an opportunity by which, through greater collaboration between these two communities, the national agenda of raising standards and personalising learning can be taken forward.

Our understanding of learning and the ways in which we talk about it are evolving rapidly. Important and timely questions arise.

- Under what circumstances and by what methods are teachers able to develop students' capacities to learn, and to learn how to learn?
- How can we ensure that there is evidence that such methods work?
- What needs to be done to make the most effective methods widely available to all schools/colleges and teachers?
- Is it possible for students to get better at learning to learn and so become independent learners?
- How might this help the personalisation of learning?
- How might further work in this area be advanced and made available to teachers and all who are involved in education?
- Is there a need to achieve greater agreement about a working vocabulary in which to talk about these important matters?

All these questions are potentially answerable. As yet, they can be answered only partially. We believe that it is possible to change the way practitioners and cognitive scientists work together so that fuller answers to these questions and better guidance to the teaching profession might be generated.

Long before they get to school, children learn at home and in everyday settings and this continues alongside their formal school experience. Children come to school with common-sense views of learning and what constitutes 'work' in school – views that are usually shared by their parents too – but ones that are often not consonant with those of their teachers. Their learning in school often assumes a different form, for here it is organised and shaped by teaching. What happens in school should enhance students' capacities to learn and their motivation to learn. When this happens, students succeed and are prepared for lifelong learning in their personal development, in the workplace and in the community. When it does not, students pay a personal and social price for the resulting disadvantage.

Teachers depend for their success on the best available knowledge about learning and about how to apply that to their professional practice. Yet teachers have often concluded that in their initial training they were given little of practical value about the nature of learning and how it is best supported through teaching. Indeed, the attention now given to the psychology of learning in such training tends to be small, and certainly smaller than in the past. So experi-enced teachers draw on a mixture of common-sense knowledge, in which learning usually means acquiring factual knowledge that can be memorised and reproduced in written forms, and much more elaborate psychological accounts, which emphasise that learning is a search for meaning that is built upon pre-existing knowledge and

is often realised in a social environment rather than something that simply takes place 'in the head' of the individual. Whether teachers come to use an explicit, elaborate and expert view of learning depends more on chance than on a planned sequence of initial training and continuing professional development in which teachers are helped to develop their expertise in learning in the light of the latest advances in cognitive science and in professional practice.

Cognitive and social scientists have a professional commitment to exploring and understanding learning, and from time to time there are authoritative accounts of the relevant research and how it may be applied in education. Perhaps the best example is *How people learn: brain, mind, experience and school,* edited by Bransford, Brown and Cocking (2000), from the National Academy of Sciences in the USA. Sadly, however, it is not a work with which most UK teachers are familiar. Research on learning advances rapidly and there is a need for a regular collation or overview of current developments, in theory and research, which practising teachers, as well as those involved in the initial training and continuing professional development of teachers, can treat as an authoritative and accessible account on which they might usefully draw. The current lack of it partly explains why teachers, teacher educators and school leaders lack a shared language in which to talk with one another about learning. There are substantial variations in teachers' exposure to different psychological models of learning and similar variations arise in their pedagogical experience. In many schools there is also no agreed vocabulary in which teachers might talk with their students about their learning, even though this is at the very heart of professional practice.

"In many schools there is also no agreed vocabulary in which teachers might talk with their students about their learning, even though this is at the very heart of professional practice."

So what goes on in classrooms in the name of learning and teaching is not as simple as it seems at first sight. Sometimes teachers instruct or tell, serving as transmitters of information that students have to acquire, memorise and be able to reproduce under test conditions as a measure of their learning. At other times teachers show and demonstrate, acting as mentors and coaches rather than as instructors. At yet other times teachers have to discover what students already know, much of which may be misunderstanding, and then find ways in which they can be helped to develop new and richer insights into problems and how they might be solved. The balance that any teacher makes between these and other approaches to learning is a matter of personal choice and of the impact of external influences, including national education policies, and not one that is necessarily grounded in the current state of knowledge about the nature of learning and how this is best applied in schools/colleges.

Under a combination of professional commitment to improve their practice and pressure from government to raise students' levels of achievement, teachers are now actively looking at a wide range of schemes or ideas that promise to help them to be better teachers who educate more effective learners, ones who will assume more responsibility for their own learning and grow in autonomy. Teachers are on the lookout: cognitive scientists and psychologists undertaking basic research, educationists applying such work to classrooms, and practitioners in schools and colleges engaging in

innovative practices to enhance learning, all these have never before had a more receptive audience among the teaching profession. The current position, in short, is one in which there is an abundance of ideas and schemes for improving learning and a teaching profession actively engaged in innovation, ready to adopt new approaches to the ways in which they work to improve learning. This is significant at a time when personalising learning is high on the national agenda. Developing the right language and practices for learning is fundamental to personalisation, for personalising learning will not flourish as it should unless everybody involved is clear about what it is that is being personalised.

Among these schemes and ideas particular attention is being paid not simply to learning, in the sense of the acquisition by learners of knowledge, skill and understanding of particular curriculum content, but also to *learning to learn.* For clearly if, in addition to increasing their grasp of, or attainment in, a particular topic or subject, students can acquire a more generic or generalised capacity to learn many different kinds of content, then students will be better served by their education. A second reason why teachers have taken such a strong interest in this topic is their recognition that in a knowledge economy some kinds of knowledge date quite quickly and have to be abandoned or replaced at a later stage. Successful lifelong learners need the ability to learn new material quickly in both their working lives and their personal development. Those who cannot learn well face educational, social and economic exclusion. The more learning can be personalised to meet the needs of individuals, the more successful and enduring their education will be.

All this is surely welcome. But, as we shall see, the evidence base for the many schemes for improving learning is variable, and this poses a series of problems that demand to be solved. Moreover, as learning and learning to learn have assumed more importance, teachers have entered into explicit dialogue both with one another and with students about learning, rather than taking learning as an implicit and taken-for-granted, if somewhat mysterious, process requiring little discussion and for which, in any event, the formal language of psychological experts is often seen as unwelcome jargon.

2 Is it possible to learn how to learn?

At first sight, learning to learn is a straightforward idea: to understand it we need no help from psychological theory. Human beings self-evidently learn and develop the capacity to learn fresh things. All we need to do is help them to develop this skill to a high degree, and they will learn more effectively. In reality, both defining the concept and finding ways of enhancing the skill(s) involved are much more tricky. Indeed, the idea of learning to learn has a confused and confusing relationship with terms that are commonly used in education, such as *problem solving* or *thinking skills* or *critical thinking* among others, for all of which claims are made that training in them will enhance both learning and learning to learn. It is confusing, even for beginning teachers, to encounter these terms for the first time, since very different words are being used to mean the same thing, and different writers employ the same words when in fact they mean very different things.

This is not the place to review what has now become a vast enterprise, though reviews of the field in some phases of the education service are now appearing. We share the approach of the Teaching and Learning Research Programme's *Learning How to Learn Project* which treats learning to learn not as a single entity or skill, but as *a family of learning practices that enhance one's capacity to learn.* There is no consensus about the membership or genealogy of this family, or even how distinctive it is. Indeed, it is difficult to disentangle *learning to learn* from just *learning,* as is illustrated in some admired and influential educational projects about learning.

"learning to learn is not a single entity or skill, but a family of learning practices that enhance one's capacity to learn."

The Royal Society of Arts well-known *Opening Minds* project suggested a family of *learning competences* as follows:

- understanding how to learn, taking account of one's preferred learning styles, and understanding the need to, and how to, manage one's own learning throughout life
- learning, systematically, to think
- exploring and reaching an understanding of one's own creative talents, and how to make best use of them
- learning to enjoy and love learning for its own sake and as part of understanding oneself
- achieving high standards in literacy, numeracy, and spatial understanding

- achieving high standards of competence in handling information and communication technology and understanding the underlying processes.

As a second example, in his work on *learning about learning*, Chris Watkins suggests that learning to learn consists of several different family members, namely:

- making learning an object of attention
- making learning an object of conversation
- making learning an object of reflection
- making learning an object of learning.

The more precise specification of the family of practices that constitute learning to learn must await both further psychological research and educational developments. We are for the present convinced that a very important or senior member of the family, one we regard as at the core of learning to learn, is *meta-cognition.* There is learning, but there is also learning about learning. People think, but they can also think about their thinking. Using the language of psychologists for these phenomena, there is cognition and also cognition about cognition. By meta-cognition we mean *the capacity to monitor, evaluate, control and change how one thinks and learns.* In less formal terms, learning to learn means reflecting on one's learning and intentionally applying the results of one's reflection to further learning. It involves:

- understanding the demands that a learning task makes
- knowing about intellectual processes and how they work
- generating and considering strategies to cope with the task
- getting better at choosing the strategies that are the most appropriate for the task

- monitoring and evaluating the subsequent learning behaviour through feedback on the extent to which the chosen strategies have led to success with the task.

When learners acquire such knowledge and capabilities, and these become habitual, they learn well. If teachers can arrange life in classrooms so that students not only learn the content of the curriculum that forms the focus of the lesson but can also enhance these learning skills in their students, they will be creating more effective learners.

We take the view, supported by the scientific evidence, that meta-cognition, as specified above, is at the heart of many of the schemes and developments taking place both in schools and colleges and in academic research, and that it is meta-cognition which is crucial to explaining the success claimed for these schemes and develop-ments, whether in terms of test scores or of gains in the skill of learning to learn.

3 The evidence for recent developments

The job of teachers is to ensure that students learn, so teachers know much about learning. Cognitive scientists study learning and so they too know much about learning. Though of course the two sorts of professional knowledge overlap, they are far from identical. The evidence on which teachers and cognitive scientists primarily rely also tends to differ.

Teachers constantly use evidence to check on whether their teaching is successful in its effect on students, on whether the student is learning, and if not what impediments and barriers to learning exist and how these can be removed. The best teachers constantly monitor what is happening to students as they set about learning and investigate when things do not proceed as planned or expected. They also enquire into their own practice so that they might get better at ensuring that their students learn successfully. Cognitive scientists also investigate what is involved in learning. They develop theories of learning and particular hypotheses which can be tested empirically through methods that are accepted within the scientific community.

"The best teachers constantly monitor what is happening to students as they set about learning"

Both communities have strong norms of showing respect for the achievements of professional peers. Teachers look to other teachers as the most credible source of new ideas and good practices. The adopted line is clear: if a practice works for one of my trusted colleagues, it will probably work for me too. In much the same way, cognitive scientists look to academic colleagues as a source of ideas. The scholarly community is the arena in which the nature of science and its methods are debated, often hotly; colleagues are the collaborators and competitors through whom scientific knowledge and advancement are built.

So we suggest that it is helpful to distinguish two types of evidence about learning and learning to learn, which we call *scientific evidence* and *practice evidence.* By scientific evidence, we mean evidence that derives from formal research, such as experiments conducted according to scientific canons, or from a study of

practice in schools/colleges and classrooms that also adopts recognised scientific methods. Scientific evidence is regarded by cognitive scientists as the primary and most trustworthy form of evidence. By practice evidence, we mean the experience, testimony and findings gathered by one or more practitioners to assess the impact of a practice on students and their learning. Practice evidence is regarded by teachers as the primary and most obvious source of evidence about the value and effectiveness of a practice.

Both kinds of evidence involve research, enquiry and investigation and the collection, analysis and interpretation of data relevant to the practice. Both vary in the quality of the evidence. For example, it is sometimes argued that the highest level of scientific evidence is that based on multiple randomised controlled trials. At the other end of the scale might be a single study using a small, unrepresentative sample in unusual conditions. In the same way, practice evidence might involve the collation of high quality evidence of different kinds by a range of teachers in multiple contexts over a sustained period. At the other extreme, it might be the claim by a single teacher that a new practice is working to good effect in her classroom.

Sometimes there is practitioner evidence alone, since the practice has not been subjected to formal research and a scientific base is lacking. Sometimes there is scientific evidence alone, since the evidence that, say, a particular method of teaching is demonstrably effective in experimental conditions does not necessarily mean that the practice is adopted by teachers in schools and found to work in their experience.

Ideally, in our view, the two kinds of evidence should be combined to provide warrant that the practice is indeed a good practice. It is when the two kinds of evidence are mutually supportive that

the evidence base for a practice is most powerful. Two notable examples of schemes with such a strong evidence base are *assessment for learning* and *cognitive acceleration*.

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Assessment for learning, as developed by Paul Black and Dylan Wiliam, was not created solely by academics who hoped that practitioners would apply it in classrooms. Rather, and significantly, it was originally co-constructed through an active partnership between secondary science and maths teachers and the researchers. It continues to be developed in other subjects and other phases. Assessment for learning is spreading rapidly, in part because it, or more accurately a version (some would argue perversion) of it, contributes to the National Key Stage 3 Strategy in England, and in part because teachers find that it works – the scientific evidence and the practice evidence are aligned and mutually supportive.

Cognitive acceleration (CASE and CAME), devised by Michael Shayer and Philip Adey, at King's College, London, with an above average evidence base and (like assessment for learning) originally applied to science and maths, has a more elaborate and more psychology-based rationale. Whilst both schemes demand professional development for teachers, cognitive acceleration requires some special, dedicated lessons to help students acquire the thinking or reasoning skills that can later be deployed in normal lessons. These differences probably explain why cognitive acceleration has spread more slowly and to a more restricted range of subjects than assessment for learning.

Both assessment for learning and cognitive acceleration are concerned with the development of learners' meta-cognition, though in very different ways. This is also a characteristic of a third scheme, that of Guy Claxton. Though he seeks to root his ideas in published research, what Claxton offers is not a highly focused scheme, as is the case with assessment for learning and cognitive acceleration, but rather a diffuse, eclectic approach to learning that draws on a wide range of psychological sources. This approach is attractive to some teachers, who can make their own selection from the menu of ideas and practices and develop their own schemes for learning to learn. But the price paid for this flexibility is that it becomes much more difficult to assess the quality of the evidence base for what happens in any individual school or classroom, simply because so many factors are at work.

The Campaign for Learning, when led by Bill Lucas, worked with Guy Claxton and adopted jargon-free language and terms that appeal to teachers. For instance, they have suggested 5 Rs (which have varied over time) such as:

- *remembering* – the ability to recall, a basic capacity in learning
- *resilience* – the habit of persisting with difficulty
- *resourcefulness* – the ability to deploy a variety of learning strategies
- *reflection* – the disposition to think about one's own learning, and about oneself as a developing learner
- *reciprocity* or sociability – the ability to learn well in the company of others.

Over many years the Campaign has been a source of ideas on learning and learning to learn for many schools and teachers and its role as advocate, developer and evaluator of learning to learn continues.

In another formulation from his work with the Lifelong Learning Foundation, Claxton writes of the seven dimensions of 'learning power':

- *changing and learning* – a sense that I can change and continue to learn
- *critical curiosity* – getting below the surface, asking questions
- *meaning making* – making a bigger picture by fitting information together
- *creativity* – finding new ways to approach information and situations
- *resilience* – being able to resist distractions from inside and outside and to tolerate the feelings of learning
- *strategic awareness* – planning, resourcing and using learning preferences to complete a task
- *learning relationships* – being able to work alone and in collaboration.

There is a large and growing number of commercial schemes designed to help teachers with learning and learning to learn, and in most cases it is more difficult to judge the quality of their evidence base. Even when there is some reported practice evidence, the scientific evidence may be thin or absent. Clearly there would be much greater warrant for these practices, and therefore public as well as professional confidence in these commercial schemes, if there were scientific evidence to support the practice evidence.

Take the case of *learning styles,* sometimes given the more technical title of cognitive styles. This relatively new idea is now very popular

among teachers, is widely applied and is thus becoming part of the everyday language of the classroom, for students as well as teachers. The concept is based on learners adopting different approaches to, or ways of, learning and these styles are usually assessed on the basis of a test or questionnaire that indicates a profile and/or the dominant or preferrred learning style of respondents.

There are very many different schemes for determining learning styles, using different names and based on different questions, though a relatively small number of these schemes accounts for the majority of applications in UK schools/colleges. So a new language of learning styles can commonly be found in schools – or more accurately a range of different languages:

- activists, theorists, pragmatists, reflectors
- divergers, convergers, assimilators, accommodaters
- verbalisers, imagers, analytics, wholists
- analysts, changers, realists
- visual, auditory, kinaesthetic.

There are three problems here. First, the research evidence for these styles is highly variable, and for many the scientific evidence base is very slender indeed, since the measures are of doubtful reliability and validity. The authors are not by any means always frank about the evidence for their work, and secondary sources – often the ones that teachers are most likely to encounter – may ignore the question of evidence altogether, leaving the impression that there is no problem here.

Second, there is usually even less evidence that, when applied in classrooms, these schemes really do help to enhance the character of teaching so that learning is improved. Sometimes there is

practice evidence, but its strength is highly variable. Too often the scientific evidence is simply lacking – and given the huge range of approaches to learning styles it is unlikely to emerge in the near future. This should not be taken to mean that teachers whose practice embraces use of learning styles are engaging in poor practice. Many teachers are successfully using learning styles as a means of getting students to reflect deeply on their learning and thus develop their meta-cognitive capacities. If there were more substantial practice evidence and scientific evidence, the evidence base for learning styles would provide a guarantee of sound professional practice.

Third, some teachers, despite the best of intentions, are using learning styles in ways that constitute poor professional practice. For example, it is sometimes claimed that learning styles are largely fixed and innate. This belief – which is curiously reminiscent of now largely abandoned notions of fixed and inherited intelligence – can lead teachers to label students as having a particular learning style and so to provide materials and sources that are appropriate to that style. Students may then come to internalise this label and think of themselves as a certain type of learner who should concentrate on this diagnosed style. In our view, this is poor professional practice that can damage a student's learning and development. Whilst is may be true that some learners have a dominant learning style, a good education does not limit them to that style or type, but ensures that students have opportunities to strengthen the other learning styles. Whereas bad professional practice restricts opportunities and narrows intellectual development, good practice uses these schemes as ways of expanding opportunities and widening ways of learning. In misguided hands, learning styles could become not a means of personalising learning, but a new version of general intelligence that slots learners into preconceived

categories and puts unwarranted ceilings on their intellectual development and achievement.

A recent review of learning styles for post-16 learners describes the relevant research as 'small-scale, non-cumulative, uncritical and inward-looking. Our review provides detailed evidence of a proliferation of concepts, instruments and pedagogical strategies… [which] is a clear symptom of the current conceptual confusion, the serious failure of accumulated theoretical coherence and the absence of well-grounded findings, tested through replication.' Of course this interpretation and conclusion can be, and indeed has been, challenged, but in our view the evidence base for learning styles is profoundly unsatisfactory and needs attention.

Many teachers have begun to use learning styles as part of their repertoire of teaching strategies, not because they have become a fad or fashion, but because they offer a way of helping to person-alise learning. As the agenda for personalising learning develops – and there is every sign that teachers are responding to the idea with energy and creativity – the need for a better evidence base for recent developments and innovations on learning is of paramount importance. Before we make suggestions for how the evidence base for learning, and associated teaching practices on learning to learn, can be strengthened through appropriate development and research, we offer a brief overview of the scientific evidence and the practice evidence.

4 What we know: the evidence from science

The most authoritative account of learning and its application to education is *How people learn: brain, mind, experience and school,* edited by Bransford, Brown and Cocking (2000). It was written by distinguished cognitive scientists who undertake basic research and explore how it might be applied to education. They state explicitly that learning theory does not provide a simple recipe for designing effective learning environments, but there are implications about the design of learning environments. These are characterised as learner-centred, knowledge-centred, assessment-centred and community-centred. Each is derived from, and is compatible with, research, and we describe these briefly in turn.

Learner-centred refers to environments that pay careful attention to the knowledge, skills, attitudes and beliefs that learners bring to the educational setting. It relates to the concept of diagnostic teaching, which starts from the structure of the child's knowledge. It is well established in cognitive science that learners always know something about the issue at hand and what they know is always their starting point for making sense. If the teacher's starting point is very different, then teacher and learner swiftly part company. The best students will then struggle to remember what the teacher teaches – and forget it quickly after any test or examination. Long-term understanding comes through learner-centred teaching or provision. In the writers' words:

> learner-centred environments include teachers who are aware that learners construct their own meanings, beginning with the beliefs, understandings, and cultural practices they bring

to the classroom. If teaching is conceived as constructing a bridge between the subject matter and the student, learner-centred teachers keep a constant eye on both ends of the bridge. The teachers attempt to get a sense of what students know and can do as well as their interests and passions – what each student knows, cares about, is able to do, and wants to do.

Knowledge-centred environments provide for learners' understanding rather than mere performance. In understanding, students learn how to use and apply their skills and they also learn the structure of subjects as well as the content. They learn how a subject works and what its big ideas are. This involves approaches to teaching that help students 'learn the landscape' of the disciplines in the curriculum. This is analogous to learning to live in an environment: you learn your way around, you learn what resources are available and you learn how to use those resources in conducting your activities productively and enjoyably.

Assessment-centred environments are strong in formative feedback to learners. It is crucial to, and well exemplified by, assessment for learning, as discussed in sections 2 and 3 above.

Community-centred environments recognise that classrooms are embedded in a larger community of homes, businesses etc and that connection should be made explicit in the design of learning experiences. There is a norm that people will learn from one another and will try to improve their learning. Implications of this concept include building good home/family support for learners and learning and maximising the capacity of students to use in school that which they experience out of school. Also implied is the employment in school of a wide range of out-of-school experts as teacher supplements.

"Community-centred environments recognise that classrooms are embedded in a larger community of homes, businesses and other similar places"

Where cognitive scientists take an active interest in educational applications of their work, there are real benefits to the education service. These do not always accrue quickly or easily, for the original idea or discovery may not appear to have the implications for education that in fact emerge at a later stage. There will always be a place for curiosity-driven research, both directly in education and in associated disciplines, especially (but not exclusively) in the burgeoning cognitive sciences and the neurosciences. But it is essential to recognise that premature and simplistic applications of 'basic' science can be dangerous and damaging.

For example, the popular notions of 'right brain' and 'left brain' learning have no basis in neuroscience. Both hemispheres of the brain are involved in every cognitive task studied so far, including language and spatial analysis. Similarly, the notion of 'critical periods' for learning has been over-applied to education. Windows during which certain types of learning are enhanced do exist: for example, the sounds of a foreign language are acquired more accurately if they are acquired early. Such windows, however, do not 'close' for any kind of learning so far studied: hence a critical period for learning a particular skill or type of knowledge cannot be missed. There is no basis in science for the idea that one type of learning is more 'natural' than another. Similarly, brain plasticity is such that learning at any age leads to remarkable growth of new connections between brain cells or neurons (synaptogenesis). Although there is extensive synaptogenesis in the early years, this does not prove that learning is somehow best or optimal during

periods of synaptogenesis, which merely reflects the fact that learning is taking place.

Claims made by some commercial programmes, such as Brain Gym, have no evidence base in cognitive neuroscience. But this does not necessarily mean that there is no educational value in such activities and some practitioners attest to their value. Sometimes scientific evidence can be ahead of practice evidence, but it is possible for practice evidence to be ahead of scientific evidence. Where there is widespread practice evidence about an activity, the lack of a scientific basis for it does not prove it is worthless, but does suggest caution. In such cases we believe it is essential to follow practice evidence with scientific evidence. We are concerned that there is currently no procedure by which scientific evidence can be commissioned to confirm practice evidence, even when it seems very important that this be done.

We support the view that over the next decade there will emerge potential applications to education of advances in basic cognitive science and neuroscience. But this potential for educational application will not come about automatically. The simple linear model by which research is undertaken and then at a later stage is somehow applied by somebody else to create high quality educational practice, has rarely been effective. Research and Development, or R&D, does not necessarily entail a crude linear model of (strong) research always preceding (weak) development, but because the R comes before the D, linearity if sometimes implied and often inferred. We believe it is preferable to speak of development and research (D&R), in which researchers and teachers work together to apply new discoveries and/or further develop new educational practices. Such 'interactive' models are more difficult to implement, but are likely to be far more success-

ful in changing practice than the older 'linear' models. Some of the best work on learning, such as assessment for learning, has been created through such close partnerships between academic researchers and practising teachers, and we believe this is the track that in most cases is likely to pay dividends. A less defensible route to follow is where an advance is made in cognitive science, teachers are attracted to the idea and begin to apply it to their practice, but there is no an attempt to collate practice evidence or to supplement it with scientific evidence that evaluates the new practices. The least defensible position is where commercial concerns – which have the advantage of easily reaching a wide audience of teachers or parents – misinterpret or distort the base science and/or the scientific evidence and apply it to learning when there is also an absence of practice evidence.

"it is preferable to speak of development and research, in which researchers and teachers work together to apply new discoveries or further develop new educational practices."

In the ensuing confusion it becomes difficult for teachers (and parents) to sort out the wheat from the chaff. Take the case of Howard Gardner's notion of multiple intelligences (often reduced to MI). The idea is that rather than thinking of intelligence as a unitary and general ability that can be measured and reduced to an intelligent quotient (IQ), we should acknowledge a range of intelligences that are only weakly related to one another, such as linguistic, mathematical, musical, spatial, kinaesthetic and interpersonal. Gardner's approach to intelligence is largely new, and though MI has been disputed in some quarters on the grounds that the

evidence base is by no means overwhelming, there has been widespread interest in the fertility of the basic ideas. Indeed, Gardner has been adding further types of intelligence to his original list. The notion of MI is now common currency among teachers, for it seems to articulate what many of them intuitively feel in their professional experience about the abilities of their students, and solves the problem that whilst teachers like the concept of intelligence, they find the older view of a unitary intelligence worryingly simplistic. There is a real tension here. On the one hand, what would be appropriate scientific caution can be overshadowed by enthusiastic entrepreneurship of those eager to apply the ideas. On the other hand, the scientists who generate the ideas may not themselves be able to be involved in educational applications (though Gardner himself played a key role in Project Zero that applied his ideas to practice) and so the backup to teacher pioneers may be lacking when it is most needed.

In the case of multiple intelligences there have undoubtedly been consequences in education that Gardner did not intend, and soon he began to distance himself from some of the applications in his name that he witnessed in schools.

> …I learned that an entire state in Australia had adopted an educational program based in part on MI theory. The more I learned about this program, the less comfortable I was. While parts of the program were reasonable and based on research, much of it was a mishmash of practices, with neither scientific foundation nor clinical warrant. Left-brain and right-brain contrasts, sensory-based learning styles, 'neuro-linguistic programming,' and MI approaches commingled with dazzling promiscuity.

Multiple intelligences theory illustrates how developments can go awry when research and development do not follow interactive models that harness scientific and practice evidence so that they become mutually supportive. MI should have led to educational developments that tested the value of educational application and then fed findings back into MI theory. It would then also have been possible to collate the various ways in which MI theory has been applied in British schools/colleges and classrooms, assembling the practice evidence of effective applications and identifying what may turn out to be misapplications and misguided practice. There could and should have been a co-ordinated D&R effort on what, in both science and practice, is undoubtedly one of the most exciting developments in cognitive science so that there would now be a firm evidence base on which teachers could draw with the confidence that their applications of MI to learning are truly warranted. The potentially huge benefits to education of advances in the cognitive sciences will require a rethinking of how development and research into learning are organised.

5 What we know: the evidence from professional practice

Teachers often turn to other teachers for ideas on improving ways on teaching and helping students to learn, and it has been a sensible part of government policy to strengthen this peer-to-peer learning of working laterally through various kinds of partnership, collaboration and networking. This process is frequently referred to as 'the dissemination of good practice'. It is now recognised, however, that 'good practice' and 'best practice' are for the most

part used very loosely, or even as synonyms. It is not enough to claim vaguely that a practice works for us, or it works here, so it's unquestionably a good practice. For a professional practice to be justified as 'good', either within the profession or by academics or by policy makers, it should meet certain criteria, but these criteria are usually implicit rather than explicit. For a professional practice to be defined as 'best' rather than simply 'good' it should be demonstrably better than other practices, again by explicit criteria. Yet this is rarely done, even in academic journals or OfSTED reports. Both the National Educational Research Forum and the Specialist Schools Trust are committed to refining the criteria for making judgements about the quality of teachers' practices and it is important that there should be a special emphasis on the practices that claim to have a positive impact on learning and learning to learn, not just test performance.

If such criteria can be generated, the next task will be to ensure that that they are understood, shared and applied to judgements about practices across the whole teaching profession and in institutions of initial teacher education and training. It will make professional judgements about good practice more robust and more credible, and probably also ensure a more rapid transfer to other teachers and schools/colleges, since the stronger the warrant for a practice, the more readily it will be accepted within the profession.

The lack of agreed criteria for establishing practice evidence does not, however, mean that we cannot say something about what we believe to be characteristic of good practice in learning and learning to learn. Unquestionably there are schools and colleges across the country that demonstrate effective practice in learning and learning to learn. In our experience they share a number of key features.

A passion for learning is central to their work; teachers and learners have a shared and agreed understanding of what effective learning is. Learning infuses the organisation and directs its improvement agenda. All aspects of life in school or college are underpinned by the question 'how will this impact on learning in this place?' In some schools a discrete Learning to Learn course explicitly develops the habits, dispositions and attitudes to support learning; in other schools a similar approach is diffused across the curriculum.

"A passion for learning is central to their work; teachers and learners have a shared and agreed understanding of what effective learning is."

This passion for learning leads the staff to be constantly looking outward for ideas and schemes that will advance the quality of teaching and learning in the school/college. They will test these new developments, sometimes with a small group that conducts trials and experiments, discarding practices that do not work but adopting and sharing more widely those that do.

Classrooms are *learner-centred*. Close attention is paid to the knowledge, skills and attitudes which the learner brings into the classroom. Learning is connected to what is already known and misconceptions are identified, explored and corrected. Students assume an active role in all aspects of learning, including creating their own hypotheses, setting their own questions, coaching one another, setting goals for themselves, monitoring progress, experimenting with ideas and taking risks knowing that mistakes are an inherent part of learning. The flow of work is sufficiently varied and challenging to maintain the students' engagement but

not so difficult as to lead to discouragement. This engagement gives opportunities for students of all abilities to succeed and avoid the disaffection and attention seeking from peers that give rise to behaviour management problems.

Classrooms are *knowledge-centred* in that they encourage deep learning as opposed to shallow learning. An observer in such classrooms sees students contributing thought-provoking comments, posing probing questions and proposing solutions to problems while analysing the ideas of others as well as their own. Students are encouraged and supported to take risks in their learning and to see 'being stuck' as a learning opportunity.

In *assessment-centred* classrooms, assessment is both formative and summative and becomes a tool to aid learning: students monitor their progress over time and with their teachers identify the next steps needed to improve. Techniques such as open questioning, sharing learning objectives and focused marking have a powerful effect on students' ability to take an active role in their learning. There is always sufficient time left for reflection by students. Whether individually or in pairs, students are given the opportunity to review what they have learnt and how they have learnt it. They evaluate themselves and one another in a way that contributes to understanding. Students know their levels of achievement and make progress towards their next goal.

Students do not learn in isolation. There is a deliberately created *learning community* in which both staff and students think of themselves as learners. Students are encouraged to help and support one another and to collaborate in a spirit of intellectual camaraderie. They work in groups with attention paid to listening skills, body language, techniques of respectful disagreement techniques etc. The ethos is characterised by mutual respect and

the development of the self-management needed for resilience in learning, and it culminates in the creation of independent, reflective learners for life.

"Students do not learn in isolation."

Such schools/colleges adjust the organisation of the day or week, and reconfigure the timetable, to provide experiences that strengthen student learning and motivation. There is the flexibility to create blocks of time for learning projects, off-site learning or real life experience, as well as structured enrichment programmes through clubs and sports.

Such schools/colleges also engage with the wider community through workshops on learning for parents and governors. A website offers the online curriculum with access for parents and students to all schemes, lesson plans, extension tasks and success criteria, so that the home-school link becomes a powerful tool for extending the learning experience.

The staff ensure that their students enjoy their learning and become confident and independent in learning. The teachers' focus on learning means that in their classrooms the art of teaching meets the science of learning.

Increasingly OfSTED reports are recognising good practice in learning to learn as well as in learning. OfSTED should contribute to establishing explicit criteria by which good practice is identified and evaluated. Once there is a clearer and wider appreciation of what constitutes good practice in learning to learn, we believe a case could be made for formal recognition of it in schools/colleges by some kind of award. Investors in People is widely used and valued in educational institutions: its main focus, however, has

been on the development of staff to achieve the institution's goals, rather than directly on student learning as such. An Investors in Learning award may be an idea whose time has come, and it might play a powerful role in driving the ongoing process of continuously defining and redefining what is meant by the effective school.

6 Independent learners: a priority

There is considerable potential to improve learning and learning to learn based on interactive models of development and research. We now offer a practical example. It concerns the link between, on the one hand, the scientific concept of meta-cognition, which appears to be common to several practices for which there is both scientific and practice evidence, and, on the other hand, a long-standing concern among teachers that their students should over time take increasing responsibility for their learning. The task is to ensure that, as they mature as learners, students gain greater independence in how, when and where they learn.

Much of what teachers do in helping students to learn how to learn consists of strengthening their meta-cognitive capacity, namely the capacity to monitor, evaluate, control and change how they think and learn. This is a critical feature of personalised learning. In part this is because meta-cognition is rich in what are held to be the components of personalised learning, such as assessment for learning. But even more importantly, meta-cognitive skills turn learners into autonomous intelligent novices who can learn new topics, subjects or domains faster than learners who lack such capacities, and they can do so without demanding more individual attention from the teacher. Meta-cognitive capacities, in other

words, give learners greater independence in their learning. As a result, for instance, they:

- become aware of the difference between memorising and understanding material, and realise that these require different mental strategies (can I remember this? is this something I need to remember? have I really grasped what this is about?)
- recognise which parts of the material are difficult and demand more attention (this bit is easy, but I need to spend more time on that bit)
- question or test themselves that they are understanding the material (how am I doing? does it make sense to me?)
- learn when it is appropriate to seek help from the teacher (I'm stuck and the several strategies I've tried aren't working, so I need help).

This last is of particular importance. Typically in classrooms, several students want the teacher's help at any one time and a queue forms for her attention. Some of these demands are very trivial and display excessive dependence: learners without meta-cognitive skills seek help at their first experience of difficulty or puzzlement. Those with meta-cognitive skills become co-constructors with their teachers of the process of teaching-and-learning, and progressively transfer the role and function of the teacher to themselves. If learners can learn to turn to the teacher for help only when they really do need it, the teacher has much more time to personalise the learning in productive ways. Ensuring greater independence in learning is critical to personalisation.

Some forms of learners' experience are largely managed if not dominated by a teacher. The teacher chooses the learning objectives and how they might be realised through a specific task; directs

the way in which the learner engages with that task; manages the timing and duration of the work; determines the mode of the outcome of the learning; and provides the evaluation of the learning and any feedback to the learner. In these settings, which are typical of classrooms, the learner might be said to be sub-stantially dependent on the teacher. In contrast to such learner-dependent settings there are many circumstances in which the learner chooses the purpose of the experience, selects the content, determines the modes and timing of engagement, and designs the outcomes. The learner here might be said to be largely independent of some other person's management of the learning.

The two forms of engagement, dependent and independent, have their merits; each is appropriate at certain times and in certain circumstances. But as learners mature their need for independence increases if they are to be successful learners in further and higher education and in the workplace. The requirements of lifelong learning and of a participant democracy in a rapidly changing world privilege the capacity for independent learning. So the most effective learners will be those who, as they pass from stage to stage, have acquired some generic capacities to reduce the time they spend in dependence. Independent learners have at their disposal a body of attitudes, values, skills and knowledge that they can deploy as appropriate to manage their own learning, wherever they happen to be.

"as learners mature their need for independence increases"

At every level or stage of education, a learner begins from a position of dependence and (in the best of circumstances) moves, with the teacher's encouragement and assistance, to greater autonomy and independence. It seems reasonable to argue that meta-cognitive capacities of self-regulation should improve with experience and maturity. More and more schools/colleges and teachers are interested in learning to learn and providing students with opportunities for developing the capacity, either through the way they conduct lessons or through specially constructed courses in learning to learn. If this is done at every key stage, there is a danger of repetition and redundancy in such provision. What is needed is an understanding of progression and continuity in this field as in ordinary curriculum provision; that is, a clarification of what is involved in getting better at learning to learn (progres-sion) and how teachers build on and extend what their students have acquired under previous teachers (continuity). For example, students need to develop the skill of knowing when to seek what kind of help from what source. A primary school child will begin by learning when to turn to the teacher for such help. A sixth-form student will have learned that help should sometimes be sought only after sustained effort to solve a problem on one's own and that there are sources other than the teacher.

Our knowledge and understanding, in both science and profes-sional practice, of how independence in learning is best developed from one educational stage to another are currently limited. More needs to be done in science and in educational practice to discover what independence in learning involves and how it is best sup-ported. Our present state of knowledge indicates that any specifica-tion probably includes:

○ the positive regard for, and personal valuing of, enhanced mastery

○ the will to learn

○ the ability to form clear goals and objectives for learning

- the capacity to persist in adversity
- knowledge of learning processes and their management
- basic skills of information processing (literacy, numeracy, ICT skills, search skills)
- the capacity to collaborate with other learners
- the capacity to manage evaluations of performances and of progress and the capacity to use feedback constructively
- the capacity to identify new horizons and to be creative and flexible in journeying towards them.

Progression towards independence in learning might be identified along the following dimensions:
- the extension of the repertoire in the above list
- the refinement of skills in the repertoire, so making any specific skill more efficient and effective
- extending the range of application of the repertoire, that is, becoming able to use it in increasingly novel and challenging circumstances.

But we do not know that this is so: the evidence base, in science and in professional practice, is weak. Independence in learning is, therefore, a priority for development and research. We believe, however, that it should not become just another research project but be an element in what we suggest should be a new approach to advancing knowledge and practice about learning and learning to learn.

7 Improving the evidence through development and research

If we do not take further action, there will be continue to be:
- an inadequate knowledge base about learning for the teaching profession
- confusion about the evidence base for the new practices that are emerging from a wide range of sources
- development and research among teachers and researchers that, taken as a whole, is unco-ordinated and rudderless.

This is unlikely to lay better foundations for the desirable goal of creating ever better learners and teachers in our schools/colleges.

David Miliband has said, 'The learning to learn skills that pupils develop…are those needed to be effective learners throughout adulthood: learning skills are key for survival in the twenty-first century.' We agree, but there is a need for greater confidence in the practices being developed to ensure that students acquire these skills. Too often teachers rely on secondary sources for knowledge about such practices and evidence that supports their adoption and use, but not all these sources are trustworthy. It is essential that the teaching profession be much better and more directly informed about the current state of knowledge about learning and the practices that best promote it, and that, given the rate at which such knowledge expands, they are kept up to date on a regular basis. This will not happen without intervention. There is an urgent need for a state of the art summary of knowledge about learning and

learning to learn and the practices in which they are best developed. This authoritative overview should be revised and reissued every three years. This would require that some key partners – for example, school leaders, academic researchers, the Teacher Training Agency – be brought together to undertake this task and then to ensure its wide dissemination and use. In our view this is essential to a realisation of our country's ambitions for educational transformation.

"It is essential that the teaching profession be much better and more directly informed about learning and the practices that best promote it"

Whilst we welcome the contribution currently being made by the Teaching and Learning Research Programme (funded by the Higher Education Funding Council for England and managed by the Economic and Social Research Council), there remains considerable scope for further D&R in the field of learning and learning to learn and its meta-cognitive core. There are many important writers in the field of learning and learning to learn with high reputations among loyal educators who have implemented their work and ideas in their classrooms, but whose work it has not been possible to mention here, including, among many others, Robin Alexander, John Bruer, Edward de Bono, Carol Dweck, Reuven Feuerstein, Robert Fisher, Daniel Goleman, Bruce Joyce, David Kolb, Matthew Lipman, Barbara MacGilchrist, Carol McGuiness, Neil Mercer, Jon Nixon, Susie Parsons, David Perkins and Alistair Smith. There is, in short, a substantial body of work, both academic and practical, for which there is a real need for a supportive and comprehensive combination of scientific and practice evidence.

A programme of D&R in this field should include:

- the promotion of new ideas, originating in academic theory or research, developed and tested under specially contrived or experimental conditions and then, if promising, tested more widely under a wide range of naturalistic classroom or school conditions

- the analysis and testing of innovations originating in schools/colleges, and in particular *combinations* of practices and policies directed to improving learning and achievement that appear to be working successfully, creating whole-school models of how effective learners are best educated

- the more effective mining of empirical evidence derived from system-wide evaluations of new developments in policy and practice through the government's own departments and agencies.

England has been commended by the OECD for the directions in which educational D&R has been moving in recent years: there are good foundations on which to build.

From our discussion above, it is clear that we believe that more D&R funds should now invested in the educational practices that develop students as effective learners and, in particular, as persons with the capacity to learn how to learn and become independent learners. This will entail more work on meta-cognition, from the early years when these abilities are developing through to older learners in higher education or the workplace, where there are fresh demands on their capacities to learn new content in what are often very different ways.

The programme outlined above is in reality a collation of developments already being promoted in some schools/colleges

that have a track record of innovation, a committed staff, rising student performances in tests and examinations, and experience of teaching students how to learn as well to learn content. Some are already engaged in relevant D&R with, for example, the Teaching and Learning Research Programme (ESRC) or the Campaign for Learning research project or Networked Learning Communities (NCSL) or the Leading Edge Programme (DfES) or the Raising Achievement – Transforming Learning Project (Specialist Schools Trust). These schools/colleges could become the sites for the next stage in a more systematic D&R programme in learning, learning to learn and independent learning. Three further requirements are essential if such a programme is to be effective.

First, the programme must be co-ordinated, by those skilled in brokering rather than inclined to control. This process should avoid extreme tendencies that could easily de-rail the programme: that it becomes strongly directed from the centre, which would damage the creative energy that is producing some of the best ideas and new practices at school level; or that, at the other extreme, there is so little in the way of incentives or pressures to work together that, as so often in the past, the various D&R activities become centrifugal rather than centripetal and simply fizzle out with time. This would be new ground, for hitherto it is has proved difficult to avoid such extremes.

“the programme must be co-ordinated by those skilled in brokering rather than inclined to control”

Second, the programme should be built around – and not in addition to – the network structures that have been growing rapidly among English schools/colleges. These network structures are rich and complex, and are both local and national.

The networks have an inherent drive towards co-ordination. Moreover, they are becoming a key means of working laterally, sharing in innovation but also devising powerful new methods of transferring validated professional knowledge. There is a vast pool of creativity among the profession that remains only partially tapped; there is unprecedented quality of leadership in schools/ colleges that is well prepared to engage in disciplined innovation; and there is within the research community a strong commitment to work on the learning agenda in D&R partnerships with schools/ colleges. The question is whether the government is willing to support and broker partnerships with school leaders and research-ers to channel this creative energy to bring us to the international leading edge in advancing the frontiers of learning and learning to learn.

The third condition is the development of an appropriate language in which learning, learning to learn and independent learning can be discussed, debated and developed. We now explore this possibility.

8 A shared language for learning

Much of our preceding discussion demonstrates that there is no agreed vocabulary about learning, learning to learn and independ-ent learning, either among researchers, or within the teaching profession, or between these two communities. It is no wonder, therefore, that parents, employers and politicians often find it difficult to understand what happens in schools/colleges in the name of learning and are sometimes frustrated by their attempts

at dialogue with teachers. All the stakeholders in education should have a shared way of talking about learning.

Happily, things are changing. The recent focus on learning is exposing for teachers this lack of a shared vocabulary on the phenomenon that is at the heart of education. In some schools/colleges, teachers are seeking to engage in explicit dialogue with students about their learning: the problem is revealed starkly where schools/colleges are developing assessment for learning, learning to learn courses, or student voice. Debate between the teaching profession and education ministers about the directions of education policy – and, in particular, areas such as 'the standards agenda', league tables, or the Tomlinson report on changes in 14-19 arrangements and the future of our systems of assessment and qualifications – all demand a shared way of talking about learning.

A better and more consensual language about learning could be invented and then issued from above, like some educational Esperanto, whose fate it would soon share. Rather, we believe it will emerge through what we have proposed: the co-ordinated programme of work around learning based in D&R networks of schools/colleges and teachers. Clarity, rigour and simplicity are essential in how all the stakeholders, especially students and their parents, talk about learning; without these features, communication and co-ordination across the D&R networks would be hindered. But the birth of such a language demands help. It needs to be part of the aim of the programme, and an intended outcome whose progress over time can be monitored and shaped.

At some stage we believe that this language can be documented and made available to the profession, to teachers in training, and to the commercial sector that produces books and materials about learning. But it would not be a glossary of terms, useful as this

might be for some stakeholders. Rather it would be the language in which the best available knowledge about learning and learning to learn is expressed, and described and reported as the best available practices in which this knowledge is embedded. It is a commonplace to say that knowledge within all professions is changing fast. It applies equally to the professions in education, yet too little is being done to ensure that, at any particular time, the best of what is known about effective practice is made available to all in the most appropriate language.

9 A proposal for progress in learning

Our suggestions on the ways forward are best conceived and implemented as an integrated set. We believe the DfES should establish a Commission on Learning, whose small membership should reflect the key stakeholders in learning. The task of the Commission should have four inter-related strands, as follows.

1 To sift what are judged to be the leading edge practices in schools and colleges and early years settings in learning, learning to learn and independence in learning. The purpose here is identify what are emerging as the most promising developments in schools/colleges with the associated practice evidence on what works. There are various sources for this information.

2 To sift what are judged to be the most promising developments in the academic/research community in learning, learning to learn and independence in learning. These will

vary from developments in basic science from which educational applications might, with further work, be developed to research projects that focus directly on educational applications. The sources of this information are various, but lie mainly in higher education, independent research organisations, and other organisations concerned with improving education.

3 To broker partnerships between the scientific and practice communities by improving the flow and exchange of knowledge and experience. In some cases, there will be a germ of a powerful idea that merits some initial D&R; in others it will be something already happening in schools/colleges for which there is practice evidence but now needs the support of scientific evidence; in yet others it will be a research-based development for which there is scientific evidence but which needs further development in schools/ colleges to generate the necessary practice evidence. Some partnerships might be easily formed, since teams and individuals in the two communities work on similar or related themes or topics, but sometimes do so in ignorance of one another. In other cases, dialogue, review and synthesis would be essential precursors to joint projects. This would be a challenging task, but at present there is no machinery to promote such partnerships in a systematic way to improve what we know about learning and how to apply that knowledge in practice. In our view these partnerships are absolutely essential to a successful D&R programme; without the machinery we advocate the partnerships of the type and scale we envisage will not emerge.

4 To issue a state of the art summary of knowledge about learning and learning to learn and the practices in which they are best developed, as described above. This would include an updating on the language in which learning and associated ideas and practices are best expressed. This document would be revised every three years and issued to all concerned with education in schools/colleges and with the initial education and training and continuing professional development of teachers and support staff.

We are of the firm view that the Commission should have a small permanent staff and budget, based either in the DfES or located in an outside body in the public or private sectors. For what would be a limited cost, the potential benefits are considerable. In 1997 those who pioneered assessment for learning depended on small grants to support the research and the dissemination of outcomes: the news about its importance spread relatively slowly, despite the clever use of teacher-friendly pamphlets, rather than just academic books or articles in scholarly journals. It has taken longer than was either necessary or desirable for this important development to assume the central place it holds today in both the policy and practice for improving learning, for personalising learning and for raising standards. Had the proposed Commission existed in 1998, when Black and Wiliam published their pamphlet *Inside the black box,* both the development of the ideas and their practical application in classrooms would have assumed greater priority at policy level and so been accelerated to the benefit of the daily lives of teachers and learners and to the government's own agenda of raising standards. It is time to learn from history. There is much talent and commitment among teachers and researchers to improve learning and learning to learn. We must all be determined to find ways in which all this can be realised much more effectively than has been possible in the past.

Annex

The Group wishes to thank the wide range of individuals and organisations who made such valuable submissions.

For a detailed list of submissions, consult the Demos website at **www.demos.co.uk/learningworkinggroup/**

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