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School as an Epistemic Apprenticeship: The Case of Building Learning Power¹

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Annual Meeting of the Education Section
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What [students] should learn first is not the subjects ordinarily taught, however important they may be; they should be given lessons of will, of attention, of discipline; before exercises in grammar, they need to be exercised in mental orthopaedics; in a word, they must learn how to learn.

Alfred Binet, 1909²

CONSIDER the following two lessons about the Tudors. They are, we might suppose, being delivered to two equivalent groups of 14-year-olds in the same school, perhaps even on the same day. In Lesson One, the students start by copying into their exercise books, as quickly and neatly as they can, a swathe of notes projected onto the whiteboard. When they have done that, they are set to read silently a few pages of their history textbook, and the lesson ends with a multiple choice questionnaire designed to assess their factual comprehension of the material they have just read.

In Lesson Two, the students arrive in their classroom to find that their teacher has written, rather cryptically, on the board, *'History is the story written by the winners (Napoleon Bonaparte)'*. She begins by engaging them in a lively discussion about what this means, and whether it is true that historical documents and accounts are necessarily partial and biased, written by someone with a particular worldview composed of beliefs and assumptions and perhaps, consciously or unconsciously, with an axe to grind. They are then asked to work in pairs to study a few pages of the same textbook, with the task of uncovering the worldview of the writer. What unacknowledged assumptions is he or she making? What opinions are being passed off as if they were facts? What facts are being asserted without any evidence or justification? And so on. (In case you think this would be too hard for an average class, I can assure you it isn't. I have seen so-called 'low-ability' classes perform this task with intelligence and gusto.) Finally, the students are asked to do a piece of creative writing about the Babington Plot (which they have learned about in a previous lesson) through the eyes of three protagonists: Queen Elizabeth, Mary Stuart, and the Lord Chancellor, Lord Burleigh.

The difference between these lessons is not merely that one is 'good' and the other 'dull'. I'd like to draw out some more subtle differences, that illustrate the theme of this paper, by posing three questions. First, what are the skills or habits of learning that are being required in each of the lessons? Second, how are the students being positioned as learners: that is, how are they led, by the structure of the lesson, to construe their 'job', with respect to the subject-matter? And third, what is the implicit conception of knowledge that is presumed by the different lesson designs? Obviously, the two lessons differ significantly – despite making use of the same pool of content – with respect to these three questions.

The first requires skills of rapid and accurate transcription, and comprehension through silent and solitary reading, for example. The second requires skills of critical literacy, the skeptical appraisal of knowledge claims, both large and small group discussion, and empathic perspective-taking. Regarding the second question: the first lesson positions the students as people whose job is limited to understanding and retaining information, whereas the second lesson invites students to become involved in the process of knowledge-critiquing as well as knowledge-retention. (As Lave and Wenger [1991] would say, they may be beginners – apprentices at the complex business of checking and testing knowledge – but their *participation* in the process, although it is *peripheral*, is entirely *legitimate*.)³ On the third question: the first lesson treats knowledge as something cut and dried, and accurately and impartially represented by the textbook. The second treats knowledge as partial and contentious, the fallible product of fallible human beings, always potentially open to question and improvement.

As I say, my point here is not the trivial observation that one of these lessons is imaginative and engaging while the other is hackneyed and boring. It is that the two lessons illustrate a

general truth: *every* lesson requires the use of a particular set of learning habits or skills; frames the relationship of students to knowledge in a particular way; and even purveys particular assumptions about knowledge itself. No lesson can be neutral with respect to those three questions. However the lesson is constructed, be it traditionally didactic or daringly inventive, it always comprises these three things: an invitation to use some mental skills (and not others); an implicit or explicit framing of the tasks and activities in terms of how it is 'proper' or 'desirable' for students to engage (and also, therefore, what is considered undesirable or improper); and a view of knowledge as positioned somewhere on a continuum from incontrovertible and timeless, to contingent and contestable. As well as being taught Chemistry or Spanish, students are always, necessarily, being taught how to engage with knowledge, what and how to question, and what their legitimate role is in the knowledge making, consuming and contesting business.

Over 15 years of schooling, these messages – largely implicit, but none the less powerful for that – constitute a protracted and expensive apprenticeship in what and how to think and learn. Education is an *epistemic apprenticeship* – 'epistemic' in that it is to do, centrally, with the activities of thinking, learning and knowing. It inevitable involves the cultivation of an *epistemic mentality*, we might say: a set of ways of approaching complexity, uncertainty and difficulty. And it also helps to shape the development of a set of beliefs and attitudes about one's own rights and capabilities as a thinker, learner and knower – an *epistemic identity*. It is this apprenticeship that I want to explore in this paper. I want to dig into this legacy of schooling – the epistemic resides that it leaves in students' minds – and into the appropriateness of this apprenticeship as a preparation for intelligent engagement with the rigours and vicissitudes of 21st century life.

These psychological residues can and do vary widely. Some people come out at the end of this apprenticeship with the belief that 'learning' is remembering data and being right, and 'thinking' is creating plausible justifications, writing well-structured little essays and winning debates. Some of those who have picked up this view have learned to see themselves as good at (these kinds of) thinking and learning – and, therefore, 'bright' – and some have come to think of themselves as useless at them, and, therefore, 'stupid'. Others, however, emerge with a different conception of learning, as being to do with curiosity and investigation. They may have developed a view of themselves as confident (or unconfident) critics, explorers and researchers.

Some students develop a patchwork of such identities. They may preserve a good sense of themselves as confident explorers in some subjects, art or music say, or in their out-of-school pursuits, but feel slow and clumsy in the kinds of learning required in mathematics or foreign languages. Alternatively, they may feel bright and confident in school learning, but ill-equipped to face challenges that have not been so carefully structured. One high-achieving 16-year-old, for example, said in a recent survey: 'I guess I could call myself smart. I mean I can usually get good grades. Sometimes I worry though that I'm not equipped to achieve what I want, that I'm just a tape recorder repeating back what I've heard. I worry that once I'm out of school and people don't keep handing me information with questions... I'll be lost.'⁴

More precisely, young people's epistemic apprenticeships may have stretched and strengthened some of the dispositions of a powerful, confident real-world learner, and not others. Some may have been guided to cultivate well-developed powers of empathy and imagination but little discipline and resilience; others the reverse. Some will have preserved and strengthened their love of questions; others may have come to think that asking questions signals lack of attention or intelligence. Some will have developed strong learning habits in some subjects but not in others. 'I can't draw (or do maths)' often means 'I have not learned how to learn in those subjects, and I have learned that there is nothing I can do about that'. And so on. Though schools do not determine these outcomes, they unarguably have a powerful effect upon the epistemic trajectories of those who pass through them. And teachers, whether they

know it or not, are continually acting as epistemic coaches, steering their students one way or another.

This rough sketch, if it has done its job, will have suggested to you that we need to add another dimension to the public (and academic) discourse of schooling. People are used to focusing on two dimensions: those of Content – what should we teach? – and Assessment – how will we know how well the content has been learned? It is with these two dimensions that politicians typically tinker in their attempts to improve the quality of education. If two dimensions define a plane, we should perhaps call this a discourse about ‘flat education’. But the epistemic apprenticeship constitutes a third dimension – the skills of and attitudes towards learning students are cultivating *by the way they are taught and assessed*. Three dimensions define a solid, and we desperately need a solid conversation about the aims and methods of solid education, not the thin and superficial forms of argumentation that dominate public discussion at the moment. To work with a flat projection of education is, of course, to neglect much of its richness and its potential.

Looked at this way, the epistemic dimension is not antithetical to the other two; it is orthogonal. It does not compete for time and attention with the transmission of content. To be interested in the kind of mind-training one is offering students is not to downplay the importance of algebra or Shakespeare. Nor is the third dimension an ‘optional extra’ that you can tack on to your teaching if you feel like it, and ignore if you don’t. It is an omnipresent shadow to everything that goes on in the classroom. Cultivating one version rather than another of an epistemic mentality and epistemic identity is, as I have argued, something out of which no teacher can ever opt. The choice is only to be aware of this dimension, and to be interested in the different kinds of mental apprenticeship one might offer, or to be wilfully blind to the epistemic consequences of one’s teaching.

If we are to become more conscious and purposeful about this inevitable apprenticeship, a number of further questions arise. What are the habits and qualities of mind that we want to be cultivating? Do we have to choose between those that help students do well in exams and those that prepare them well for further study or for life in general, or can the same habits serve both ends? What is the best way to go about cultivating these habits? How will we know if the attempt has been successful? And what scope do teachers and schools have to improve the epistemic apprenticeship they are offering, in the face of the current widespread political commitment to a flat and impoverished model of education?

The desired outcomes of education

Let’s start by putting schools back onto a solid footing. Education is the deliberate attempt to cultivate certain kinds of people. It is society’s investment in developing in its children the knowledge and skills, *and also the values and attitudes*, that the ‘elders’ think is in the best interests of their society as a whole, and the well-being of its future citizens. Imagining, as best they can, the perils, challenges and opportunities of the future – the world in which the pupils of today will, as adults, have to flourish and prosper – the elders try to anticipate the on-board resources which all their youngsters will need; to identify those which cannot be presumed to develop just in the unsupervised process of growing up; and to design experiences that will deliberately cultivate those personal resources. It follows from this view of education that, unless the elders keep reviewing both the specification of those desirable outcomes of education – the *valued residues* of that massive investment – and the means of developing them, then the educational enterprise is doomed to be rudderless and/or anachronistic.

One might well argue that it is socially irresponsible, as well as intellectually lazy, merely to assume that these values are timeless and self-evident – to carry on as if it were somehow unquestionably obvious that the ability to discuss the plot of *Othello* or solve simultaneous equa-

tions were necessary preparations for life in the global, digital world of the 21st century. That is why so many countries round the world have recently been rewriting their specifications of these values residues. Singapore (2009), for example, is now committed to developing an educational system which will produce young people who:

have the moral courage to stand up for what is right; pursue a healthy lifestyle and have an appreciation of aesthetics; are proud to be Singaporeans; are resilient in the face of difficulty, innovative and enterprising, purposeful in the pursuit of excellence; and able to collaborate across cultures, think critically and communicate persuasively.

The new Australian Curriculum (ACARA 2013) starts from the view that ‘education must... anticipate the conditions in which young Australians will need to function... when they complete their schooling’, and take account of ‘the changing ways in which young people will learn, and the challenges that will continue to shape their learning in the future’. It acknowledges that:

21st century learning does not fit neatly into a curriculum solely organised by learning areas or subjects that reflect the disciplines. In a world where knowledge itself is constantly growing and evolving, students need to develop... general capabilities and dispositions that... equip them to be lifelong learners able to operate with confidence in a complex, information-rich, globalised world.

This leads the curriculum to give a central role to the development of ‘the capacity to learn’ itself, as well as to ‘think deeply and logically’, ‘plan activities independently’, ‘collaborate and work in teams’, and ‘act with moral and ethical integrity’. The cultivation of ‘personal values and attributes’ such as creativity, innovation, imagination, resourcefulness, resilience, empathy and respect for others, is also placed centre stage. A series of publications will ‘make explicit how the general capabilities can be addressed in each learning area’ so that students will be capable of ‘critical and creative thinking... in their lives beyond school’.

One could point to very similar thinking in a host of different countries including New Zealand, Finland, Scotland and Ireland, as well as multinational agencies such as the OECD. It is striking how, in every case, the ‘valued residues’ of education are couched not in terms of knowledge or content-specific skills – and not just in terms of linguistic, mathematical or digital literacies – but in terms of broader qualities of mind and personality. A wide range of terms is used to talk about this psychological territory: 21st century skills, soft skills, ‘personal learning and thinking skills’⁵, key competencies⁶ (or competences⁷), character strengths⁸, thinking or learning dispositions⁹, attitudes, habits of mind¹⁰ and so on. But, whatever the particular form of words, the desired outcomes of education are invariably expressed in terms of general ways in which the citizens of the future will meet certain important kinds of situation, especially those that are complex, perplexing or unfamiliar.

Broadly, the qualities of mind that crop up again and again seem to fall into three broad categories. The first are basic qualities of *self-control* or self-regulation. This has several important aspects: the abilities to control attention and stick to a task despite distraction; to keep track of different sources of information; to regulate the expression of emotion through strategies such as ‘self-soothing’; to control behavioural impulses; and to prioritise long-term goals over short-term attractions. From the famous ‘marshmallow test’ (Mischel et al., 1989) to a longitudinal study of 1000 children in New Zealand (Moffitt et al., 2011), a wealth of research attests to the value of self-control as a predictor of life success, as well as achievement in school. Indeed, as far back as 1916 Alfred Binet, much-maligned pioneer of intelligence testing, noted that performance in school

admits of other things than intelligence; to succeed in his studies, one must have qualities which depend especially on attention, will and character; for example, a certain docility, a regularity of habits, and especially continuity of effort (quoted in Duckworth & Allred, 2012).

Secondly, there are widely-endorsed ethical or *prosocial* qualities such as kindness, generosity, honesty, trustworthiness, empathy and tolerance. These are seen as being of value for social cohesion as well as for the well-being and fulfilment of individuals. Many curricula mention participation in civic life, and multicultural societies such as New Zealand, Singapore and Australia often explicitly aim to develop tolerance and understanding between their different communities. Some also seek to develop ecological awareness and responsibility. Again, many of these qualities are seen as being valuable both for success in life and for achievement in school.

And thirdly, there are the *epistemic* qualities, the ones on which I am focusing in this paper, that seem to relate specifically to people's predominant responses when they encounter difficulty, complexity and uncertainty. Habits of mind that are frequently cited under this heading are resilience or perseverance, creativity and imagination, communication, team-working and leadership, flexibility and resourcefulness, and reflection or 'metacognition'. As the earlier illustrations showed, these epistemic qualities are regularly seen as being of critical importance for living a fulfilling life in a complex, fast-changing and multivalent world.

Clearly, these three kinds of personal qualities overlap extensively in practice. Good communication contributes to social harmony as well as to group problem-solving. Empathy is a social virtue, but it also confers the learning ability to take different perspectives on a tricky situation. Determination in the face of difficulty often relies on the ability to maintain focus on one's goal and sacrifice some more immediate pleasures. Self-control contributes to social cohesion. An inability to tolerate uncertainty and a lack of confidence in the face of strangeness or difficulty may lead to defensive or intolerant reactions that jeopardise public order. And so on.

There is a complex story to be unravelled about the ways in which these different 'character strengths and virtues' (Peterson & Seligman, 2004) co-evolve during development. We might ask how resilience grows out of earlier forms of 'executive functioning' (Harvard, 2010), or how the growing sophistication of empathy and imagination entwine in the course of child development, and how the child's environment, including their educational environment, influence these relationships. When children devise games and play together, they are learning social skills, but they must also be developing their self-control: you quickly learn that the game breaks down and tempers fray if you unilaterally decide you want to be the Mummy, not the Doggie.¹¹

But tracing this story is for another time. Here, I want to focus mainly on the third of these three overlapping categories, the epistemic dispositions, and ask, once we have drawn up a list of those attributes we wish children to have, how best that development can be strengthened and developed. How can we make the epistemic apprenticeship more targeted and effective – whilst making sure that the cultivation of more conventional forms of knowledge and skill are protected and enhanced as well? And how can we ensure that all young people benefit?

Who benefits?

It is sometimes argued that attention to the development of 'life skills' or 'character strengths' is only necessary or appropriate for some groups of children and not others. Is this territory too complicated for the 'low achievers' to engage with, for example, making it available only to those students who are more articulate or reflective? Or perhaps, on the contrary, is it precisely those 'low achievers' who are most in need of it – 'compensatory life skills for the less able', as I have heard it put – making it something with which there is no need to bother their more successful peers? It seems, however, that the presumptions behind both these views are unwarranted.

It certainly looks as if children from disadvantaged backgrounds benefit from the deliberate cultivation of qualities of self-regulation and learning-to-learn. Following an extensive review of the evidence, Tough (2012) puts it like this. Children from, broadly, ‘middle-class’ families

enjoy support from their families, schools and cultures that protects them from the consequences of occasional detours, mistakes and bad decisions. [But] if you don’t have that kind of safety net – and children in low-income families almost by definition do not – you need to compensate in another way. To succeed, you need more grit, more social intelligence, more self-control than wealthier kids. (p.103)

In other words, if you are not lucky enough to live in a community that steers and regulates you, in order to succeed you have to be helped to learn to do it for yourself. And schools that invest in developing those qualities of mind, in disadvantaged young people, not only help them to get the grades they need to go to college, but also help them to cultivate the attributes they will need to stick the course and graduate (Duckworth, Quinn & Tsukayama, 2012).

Meanwhile, it turns out that high achieving young people also need exactly the same qualities if they, too, are to thrive when they go to university and are deprived, often for the first time, of those ever-present safety nets. Mark Phippen, head of the Cambridge University counselling service, was recently quoted in the *Times Educational Supplement* as saying: ‘We are quite aware of the number of students who are obviously very academically able but paradoxically lack confidence. That may come about from [students] being less prepared to take on challenges without others helping them out.’ While Alan Percy, Phippen’s opposite number at the Oxford University counselling service, said: ‘Students often don’t grasp the full meaning of learning. Learning is finding out something that you did not know and struggling with it. It’s almost as if, if [today’s students] do not know something immediately, they feel as though they are failing.’ Both Phippen and Percy are of the view that this lack of resilience and resourcefulness reflects an increase in a kind of two-dimensional teaching at school that over-helps students to get the grades they need, but deprives them of opportunities to learn how to struggle productively on their own or with their peers.

Approaches to developing qualities of mind

If schools are to be places that systematically develop these kinds of attributes (alongside the more familiar preoccupations with the mastery and manipulation of bodies of knowledge), how should they go about it? To put it formally: what aspects of the students’ overall school experience are relevant to the development of such qualities, and how should they be configured so as to be reliably effective in achieving their aim? What bits of school constitute the active ingredients of the epistemic apprenticeship, and how can they best be blended and deployed, so that the outcomes of that apprenticeship include both the best possible examination grades, and an effective preparation for 21st century life?

To answer this, we need to clear away some approaches that are patently inadequate. First, we might remind ourselves that qualities such as resilience, imagination or empathy cannot be developed merely by students being taught *about* them. Contrary to some naïve assumptions, knowledge and understanding do not automatically translate into habit change (Raine & Yang, 2006). There is no evidence, for example, that students who can discuss Howard Gardner’s theory of multiple intelligences (Gardner, 1983) have thereby become any more multiply intelligent. People do not quit smoking because they have understood the health risks. Nurses’ scores on tests of moral reasoning do not predict their actual kindness or honesty very well (Ketefian, 1981).

Nor, it seems, does a skills training model work very well. Perkins and Ritchhart (2004) have shown that trying to drill students in ‘thinking skills’, for example, produces short-term gains in

thinking performance in the situation in which training took place, but these gains frequently die away quite quickly, and fail to transfer from the original learning situation to other situations where they are potentially relevant and useful. Perkins and Ritchhart prefer the word *disposition* to *skill* because a major influence on how people actually behave is not whether they have ‘learned the skill’, but whether that way of responding comes to mind at relevant moments. A crude ‘training’ model, applied to the development of dispositions such as ‘resilience’ (the tendency to persist in the face of difficulty) or ‘empathy’ (the tendency to ‘see it from their side’ especially at times of potential conflict), fails to establish the requisite ‘sensitivity to occasion’, as Perkins and Ritchhart call it. The habits of mind which Singapore and Australia are seeking to cultivate in their young are not ‘skills’ in the same sense that welding or crocheting are skills; they are much more nuanced inclinations to respond in general kinds of ways to rather broad and ill-defined kinds of situation. And the ‘training model’ does not allow for the gradual development of the requisite sensitivity and sophistication.

An approach to the epistemic apprenticeship that seems more appropriate is one that draws on Lave and Wenger’s (1991; Wenger, 1998; Wenger et al., 2002) idea of a *community of practice*, in which an interwoven set of attitudes and skills are passed on from ‘old-timers’ to ‘newcomers’ over time, through a whole host of methods and media. These may include modelling, casual feedback and correction, and the telling of pointed jokes and stories, as well as direct instruction and the design of explicit learning activities. Through affiliation to a community of practice, newcomers soak up the beliefs, identities, expectations and values that are embodied by old-timers, as well as their skills, habits of attention and characteristic ways of reacting to and interpreting events, in ways that may or may not be consciously intended or monitored. Medical students, for example, learn, as they follow consultants on their rounds, not just the subtleties of questioning a patient to elicit relevant information about their condition, but also the kinds of respect which ‘being a consultant’ elicits from patients and nurses – and the indirect ways in which a consultant might signal that such respect is due (Silman, 1972).

Communities of practice are rarely homogeneous in the messages they embody and convey. No medical school would like to acknowledge that it is, very effectively, teaching medical students to adopt a tone of arrogance or almost papal infallibility in their dealings with patients – yet, as Silman points out, they may very well have been doing so. The explicit agendas and values of a culture may be quite different from, or even at odds with, the values that are embodied and conveyed to newcomers simply through ‘the way we do things round here’.

Schools are generally like this: their actual effects on students may be quite different from their declared or intended effects. We might roughly identify three levels at which schools, as communities of practice, communicate their values and assumptions. First, there is often an explicit rhetoric of ‘preparing the whole child for life’ or ‘enabling them to fulfil their potential’ – though precisely what this entails is often unclear. Then there is a level to do with the kinds of achievement which the schools seems, in practice, to value – often a mixture of examination success, admission of students to prestigious universities, prowess in sports, music and drama, and glowing inspection reports. By their crowing ye shall know them, we might say. And finally, often less explicit still, is the day-in, day-out epistemic apprenticeship which conveys the powerful messages about learning we have been exploring.

Aspects of the epistemic apprenticeship

I want now to illustrate some of the ways in which the community of practice of a school can transmit these messages – the elements of the epistemic milieu that impact on students’ development as *learners*. I want to suggest ways in which these channels might be used more effectively and systematically to develop the habits of mind that support powerful and confident real-world learning. Figure 1 shows the structure of the ensuing discussion. Each ring repre-

sents an aspect of the school culture that can impinge on the development of students' attitudes and dispositions towards learning. They are some of the elements that make up the epistemic apprenticeship. Once they are clearly identified, they become open to alteration. Focussed and targeted culture change in a school becomes possible.

Learners. Schools and teachers have a discourse for talking about students as learners that may convey a variety of messages. They may talk about learning as purely a matter of 'ability' and 'effort' – how well you learn depends on how 'bright' you are and how 'hard you try'. This language is impoverished in that 'ability' is often presumed to be fixed, and, therefore, not anything that either the student or their teacher can do anything to enhance (Dweck, 2000). 'Effort' does seem to be something – in the most impoverished linguistic environments, the only thing – that students can control, but it is unfocused and unhelpful. It is rarely clear what exactly 'trying harder' amounts to, nor whether it is possible to 'try smarter' as well as harder.

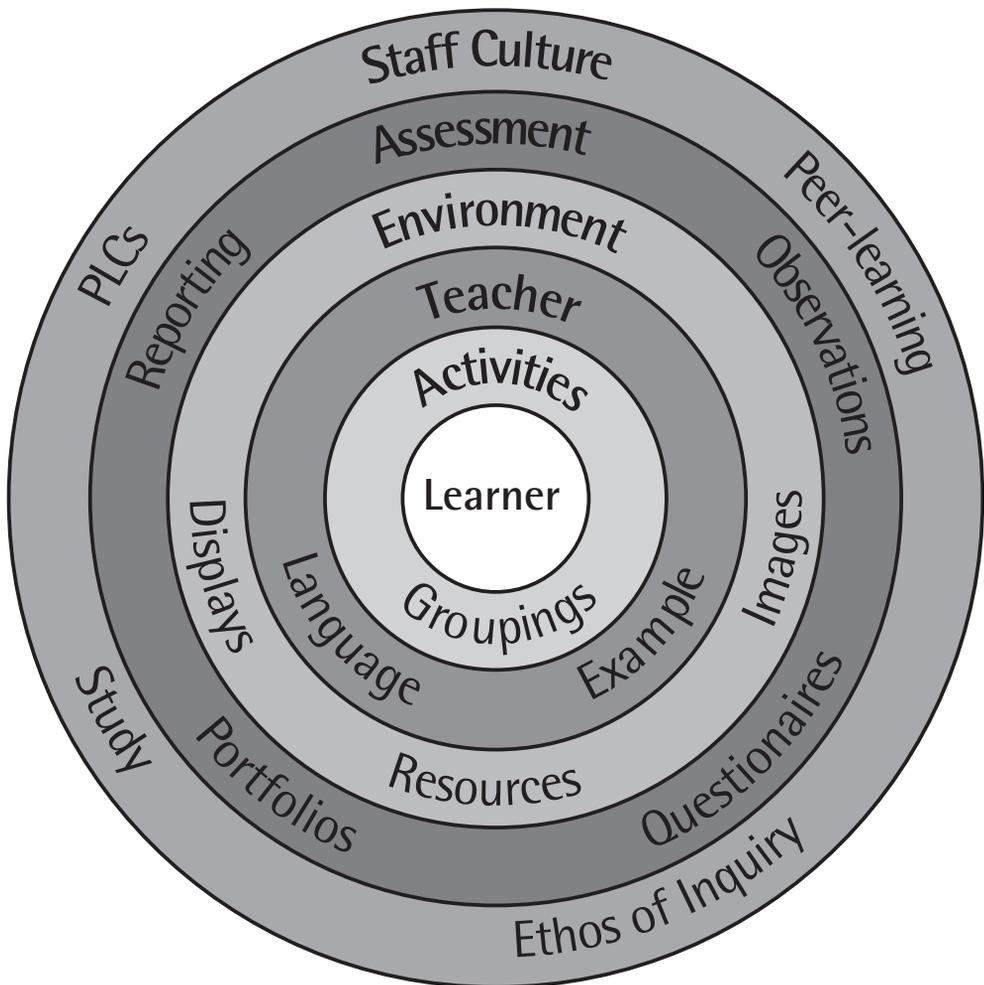


Figure 1: Aspects of the epistemic apprenticeship.

Activities. Seen from the epistemic apprenticeship perspective, lessons comprise activities that require (or invite) students to draw on a particular sub-set of their mental tools and resources. The two sample lessons with which this paper opened illustrate how the same content can be used to engage very different kinds of mental activity. In the stereotypical ‘chalk-and-talk’ classroom, students can spend years developing the skills of sitting still, suppressing spontaneous conversation with peers, silent reading, retention of factual information, and retrieving and manipulating information and ideas in limited ways under stressful and time-limited conditions. They are also at risk of developing the personas of acquiescent knowledge-consumers (though some students may stubbornly resist being thus positioned). In the traditional ‘good grammar school’ epistemic apprenticeship, activities are predominantly designed to develop the additional skills of fluent argumentation and analysis, both in debate and on paper. Students who take to this kind of learning easily, either because a relevant apprenticeship started early in the home, or because they figured out the craft of scholarly learning for themselves, are strongly invited to think of themselves as intelligent. Others who struggle are often led, surreptitiously, to interpret their difficulties as evidence of a lack of intelligence (Nuthall, 2007; Claxton & Meadows, 2009).

Teacher demeanour. Teachers steer the epistemic apprenticeship of their students by the way they talk and the attitudes they model (Rose, 2004). Dweck (2000), Frome and Eccles (1998) and others have shown the dramatic effects on students’ attitudes towards learning – especially their resilience in the face of difficulty – of the kinds of attributions which their teachers and parents make for their successes and difficulties. Broadly, teachers may attribute students’ success to ability, effort or the deployment of effective learning habits; and their difficulties to lack of ability, lack of effort, or their failure to bring effective habits to bear on the task. ‘Lack of ability’ attributions undermine students’ resilience by encouraging them to see the cause of failure as a personal quality that they can do nothing to alter. They come to think that ‘If I haven’t got what it takes to succeed, it would be pointless of me to try’.

Environment and resources. Physical environments afford and invite different kinds of learning, and contribute towards building different attitudes towards learning. Isolated old-fashioned desks make it hard to engage in peer conversation or group work. An environment in which access to resources is strictly controlled by the teacher prevents students from thinking for themselves about the resources they might need, and thus slows the development of an attitude of ‘resourcefulness’. Displays of students’ work that only include their finest products effectively make the learning drafts and processes that led to those products invisible, and thus suggests that attention to those intermediate steps is not worthwhile.

Assessment. The kinds of assessment, both formative and especially summative, that a school deems to be necessary and valuable, have a powerful influence on the kinds of learning, and the attitudes towards learning, that students are led to develop. Regardless of the public rhetoric of a school (which may stress its commitment to holistic development), the ‘roll of honour’ boards in the school hall, the achievements which regularly feature in newsletters, brochures and websites, the de facto emphasis placed on grades as examinations such as GCSEs or A-levels draw near, and the daily preoccupations that teachers reveal through their marking and other sources of feedback, may all conspire to develop a highly instrumental attitude towards learning in students, and a concomitant fading of any intrinsic curiosity in the subject matter ‘for its own sake’. Teachers often complain of their students’ apparent passivity and their desire to be ‘spoon-fed’, yet remain unaware of the extent to which the culture of the school has made it reasonable, or even necessary, for students to develop the attitudes that they then deplore.

Staff culture. The collective attitudes that a school's teaching staff have towards their own professional development impact directly on students' learning attitudes and learning achievements. Hattie (2012) has shown that 'the greatest effects on student learning occur when teachers become learners of their own teaching, and when students become their own teachers' (p.18). He explains that 'when students become their own teachers, they exhibit the self-regulatory attributes that seem most desirable for learners (self-monitoring, self-evaluation, self-assessment, self-teaching).' An environment in which teachers are solely focused on squeezing their students through tests, and where 'good teachers', defined in this narrow sense, see no need to explore developments in their own teaching style and method, is one which fails to develop those self-regulatory skills and attitudes, and which then, paradoxically, achieves lower levels of attainment than it could (Flink, Boggiano & Barrett, 1990).

There are many other ways in which the school culture impacts on students' growth as learners, but these examples may serve to make my point. On the surface, schools are about the development of knowledge, the ability to manipulate knowledge, and especially the literacies – linguistic, mathematical and digital – that underpin that manipulation. But below the surface, they are also about the development, intentional or not, of skills, dispositions, attitudes and values about learning which summate either as an all-round confidence in the face of difficulty, or as a generalised sense of anxiety or inadequacy in the face of difficulty. It turns out that the former is not only a better preparation for the challenges of university, work and 21st century life in general, but also produces students who perform better in school examinations (Watkins, 2010).

Building learning power

There are a number of approaches to school improvement and teacher development that explicitly aim to improve the quality of the epistemic apprenticeship that is on offer to students. They include John Hattie's *Visible Learning* (Hattie, 2009, 2012), David Perkins and Ron Ritchhart's *Visible Thinking* (Perkins, 2009; Ritchhart, Church & Morrison, 2011), Art Costa and Bena Kallick's *Habits of Mind* (Costa & Kallick, 2000), Susan Hart and colleagues' *Learning without Limits* (Hart et al., 2004) and our own *Building Learning Power* (Claxton, 2002; Claxton et al., 2011). We have recently dubbed these and similar approaches 'expansive education', focusing as they all do on the explicit and systematic expansion of self-regulatory, pro-social and epistemic attributes and qualities of mind (Lucas, Claxton & Spence, 2013). In the rest of this paper I want to illustrate from our own work how school and classroom cultures can be adapted, in order to become better incubators of transferable learning habits.

Building Learning Power (BLP) is a practical knowledge-base derived from the work of a large, loose network of schools and teachers that are keen to improve the quality of the epistemic apprenticeship they offer young people. BLP grew out of research for my book *Wise Up: The Challenge of Lifelong Learning* (Claxton, 1999) which reviewed the international research rationale for practical approaches to 'learning to learn' in schools. First trialled in Christchurch Primary School in Bradford-upon-Avon in the south of England in the late 1990s, BLP has now had a significant impact on, at a conservative estimate, around 5000 UK schools (nursery, primary, secondary and special), as well as universities and colleges, and the classrooms of say 50,000 teachers. There are or have been active groups of BLP schools supported by several local authorities in the UK, including Devon, Solihull, Sheffield, Milton Keynes, Cardiff, Newport, Oxfordshire and the Isle of Man, as well as the London boroughs of Harrow, Enfield, and Newham. A range of action research projects and independent evaluations have arisen from a number of these collaborations.

In addition, there are, to our knowledge, schools experimenting with the BLP approach in Ireland, the Netherlands, Switzerland, Poland, Dubai, Singapore, Indonesia, China, New Zealand, Australia, Brazil, Argentina, Chile and the USA. We are currently working with, for example, high-achieving independent schools in England, Switzerland, Australia and New Zealand; with poor rural primary schools in Silesia in the south of Poland; with language schools in towns across Argentina; and with schools for children with special needs and learning difficulties in London and the Home Counties.

At the 'hub' of this activity there is the Centre for Real-World Learning (CRL) at the University of Winchester, my current academic base, and a small company, TLO Ltd (short for The Learning Organisation). CRL researches the development of 'dispositional teaching and learning' in a number of contexts, especially those that involve physical, vocational and technical learning (e.g. Claxton, Lucas & Webster, 2010; Lucas, Spencer & Claxton, 2013), and those that seeks to develop the dispositions that underlie creativity (e.g. Claxton & Lucas, 2007; Spencer, Lucas & Claxton, 2012). CRL also hosts the Expansive Education Network, an online forum for schools and teachers to share classroom enquiries and action research projects that develop and trial practical approaches to 'expansive education'.¹² TLO collates schools' experiments and experiences with the BLP frameworks, and turns them into useful publications, resources, training events and consultancy for schools, available if and when they feel the need of some support and guidance to stimulate or deepen their own journeys.

BLP offers schools a number of tools to support schools' efforts to change the nature of the epistemic apprenticeship they provide. These tools include:

- Vocabularies for thinking and talking about learning. These include:
 - Ways to describe the character traits that underpin powerful learning (see Appendix 1).
 - A 'process language' for talking about the ups and downs of learning as it happens in the classroom.
 - Forms of language that invite imaginative or critical engagement by students, as well as efforts to comprehend and retain information.
- A large number of seeds and ideas for making small changes to teaching methods and the ethos of the classroom. These include:
 - How to design 'split-screen lessons', which simultaneously aim to develop conceptual understanding and some specific aspect of students' 'learning power'.
 - A variety of 'learning routines' that teachers can use to encourage students to draw on a richer range of learning habits (some adapted from Ritchhart et al., 2011).
 - Visual displays and artefacts that act as reminders and supports for both teachers and students.
- A framework for leaders of professional development in a school which helps them to support the necessary kinds of habit change in colleagues.
- A method – the 'learning review' – for clarifying and reviewing the nature of the epistemic apprenticeship that already exists in a school.
- Suggestions for strengthening a culture of mutual support and experimentation amongst staff (a 'community of enquiry').
- A route-map – the 'learning quality framework' – for school leaders to help them plan and prioritise the various layers of culture change they might be trying to bring about, and review progress.
- A fully-tested self-report instrument – the Learning Power Questionnaire (LPQ) – for capturing the development of students' learning capacities (Mortell, 2012).
- Networks of like-minded schools and teachers (such as the Expansive Education Network) that can share ideas and offer mutual support and professional development.¹³

It will be clear from this list of resources that we see the epistemic culture of a school as a reflection of many layers and aspects of the school's culture. As I said earlier, an epistemic apprenticeship involves enculturation as much as it does 'training'. Epistemic messages are conveyed as much by the layout of furniture, or the kinds of accomplishments and trophies that are displayed (and not displayed) in the school foyer, as they are through explicit instruction. Thus, attempts to change or develop the nature of the epistemic apprenticeship require attention to all these embodied assumptions and values, as well as to the school's more explicit practices and rhetorical commitments. A good deal of strategic guile, planning and patience may be required from school leaders, we have found, if this extended process of culture change is to prove successful. More on this in a moment.

All of these resources are offered to schools in a clear spirit of 'suck it and see'. It is rare to find a flourishing BLP school that has slavishly adopted any of them lock, stock and barrel – indeed, it would be counter to the spirit of BLP if they were to do so. Schools generally find our templates useful for 'getting the conversation going' and helping them to stay focussed on the epistemic apprenticeship aspect of their work, but they then critique and customise the frameworks to suit their own contexts and ambitions. The discussions that arise serve the very important goal of developing understanding and 'buy-in' in all concerned. It will be clear that BLP deliberately rejects the 'medical model' of school improvement which requires 'experts' (academics, policy-makers) to generate 'evidence-based' ideas off-site that then must be 'implemented' by staff in a school regardless of their own vision and values, or of the affordances and constraints of their current culture and situation. Schools are complex, adaptive, living systems and, as history repeatedly attests, such systems respond in highly unpredictable ways to any externally imposed perturbation (Elmore & McLaughlin, 1988; Davis et al., 2000). (This lesson is seemingly unlearnable by politicians, who persist in trying to mandate change in schools that stubbornly refuses to happen, creating instead regular dust-clouds of irritation and confusion.)

Appendix 1 contains some materials that illustrate how some of the different facets of BLP can be linked together. The first page shows one version of the conceptual framework for describing 16 'learning habits' of powerful learners.¹⁴ They are arranged in four groups: one that is mainly to do with the control of emotions and attention in the context of learning; one that focuses on the skills and aptitudes for learning; one that concerns the skills and attitudes that underpin successful engagement with other people in the context of learning and problem-solving; and one that develops the kinds of reflection, self-awareness and self-regulation that complex learning requires. This framework is by no means exhaustive – it is designed to be of practical use to teachers in changing the epistemic apprenticeship they offer, rather than to be completely water-tight from a scientific or conceptual point of view. (Any way of cutting this particular pie has to be informed by pragmatic as well as scientific considerations, and is inevitably somewhat arbitrary. The framework actually derives from a long iterative process of scouring the research literature, modifying the framework to include new discoveries, and trying it out with teachers to see if it 'makes sense' and 'rings true' to them and serves as a productive tool for thought. We think these criteria of *intelligibility*, *plausibility* and *fruitfulness* (Hewson, 1981) in the eyes of practitioners are both valid and important.)

The second page of Appendix 1 shows how these descriptors can be turned into a self-report questionnaire (LPQ) that enables students to review their own development as (hopefully) increasingly powerful learners. Having filled in the LPQ, students might: (a) compare their responses with those they gave at an earlier point in time; (b) use them to initiate a reflective conversation with another student; (c) use them as the basis for a conversation with a teacher or tutor; (d) use them to identify areas of learning power on which they might focus

over the coming weeks, and possibly set their own targets for improvement. The LPQ is principally designed to be used formatively in these kinds of ways, and only with great care summatively.

The third page shows how the same characteristics might form the basis of an observation schedule that teachers (teaching assistants, researchers, or other students) might use to capture information about the learning habits of a particular student. Again, this could be used as the basis for formative conversations between teacher and student. And the use of such a tool might also help to scaffold the development of teachers' sensitivity to the ways their students are going about learning, and to notice any changes or 'personal bests' in their learning habits. (Carr [2001] and Carr and Lee [2012], contain many examples of this perceptiveness to learning processes in early childhood and primary settings.)

The fourth page offers some suggestions about how teachers might modify the informal commentary they offer on students' performance, in the course of normal lessons, so as to encourage the development of a particular learning habit. We have found that this commentary forms a powerful carrier of teachers' values and expectations for students, but that it requires a degree of self-awareness and deliberate practice for teachers to see how they could intentionally vary this commentary as a way of broadening the epistemic apprenticeship they are offering to students.

Habit building, habit change and culture change

Building up the personal resources to meet challenge and uncertainty with resilience and resourcefulness takes time. The requisite resources are largely dispositional and habitual – people not only need to possess the right skills, but those skills need to come to mind at the right time. Resilience, for example, inheres in the inclination to meet difficulty with fortitude and determination, and to build resilience, therefore, one must have had multiple experiences of facing a wide variety of challenges and finding that intelligent effort is often rewarded. Habit formation takes weeks and months, not hours and days: Lally et al. (2010) have found that making a simply dietary change such as eating a piece of fruit as part of one's lunch takes on average around a couple of months. It is a regular part of the process of habit formation that you forget, feel despondent, need reminding of the purpose and value of the revised habit, and benefit from encouraging support. Thus the model of teaching and learning that is appropriate for the formation of long-term, flexible habits is very different from the model that fits the retention and regurgitation of facts and explanations.

This means that teachers often have to start to think differently about the classroom environment which they create. They need to get used to noticing and acknowledging the learning habits that students are using, and offering encouragement when they see progress. They need to think about creating a stable environment which constantly affirms the inevitability of the confusion and frustration that attend any learning that is worth its salt, and the deep satisfactions that come from intelligent and determined wrestling with difficulty – whether it be a mathematical equation, a Spanish translation or a tricky manoeuvre on the sports field. And teachers may also need to change the way they plan lessons and design activities. All this means that they, like their students, are going through a process of habit change and formation, and thus require the same kinds of understanding, patience, determination and support.

The requisite model of teacher learning, therefore, is, like the model of student learning, different from the one that has been most prevalent and most familiar in the world of teacher education. The model that has dominated the professional development of teachers supposed – despite all the evidence to the contrary – that a short course ought to be sufficient for sustained habit change to occur: and it isn't. Teachers, like their students, may well find that they are being asked not merely to 'implement an initiative', but to embark on an epistemic

apprenticeship of their own. And this, in its turn, means that school leaders have to take a longer view of the process of culture change that they may feel needs to occur in their schools. It is indeed a process that requires discussion and, as far as possible, buy-in from the whole community, as well as sustained tinkering, coaching, mentoring and support. They themselves may need to take stronger ownership of the strategic vision and values of the school, and chart a flexible path towards clearly articulated, but possibly less familiar, valued residues for all the young people in their charge. Paying greater attention to the nature of the epistemic apprenticeship on offer, and trying to improve it so it prepares youngsters better for life, is a big commitment. Advice, guidance and encouragement from beyond the school is often found to be valuable, if not essential – and that is where the wider networks and resources of the extended BLP community can prove very useful.

Monitoring and assessment

One vexed aspect of the culture change process concerns the issue of monitoring and evaluating the process of changing the epistemic apprenticeship that school students are experiencing. There are two aspects to this: trying to show that the epistemic apprenticeship does actually increase students' learning power; and trying to track changes in teachers' habits and in wider aspects of the school culture. Both if these are problematic, but in the space available here I will focus my remarks on the former.

There are a number of ways of trying to track the development of students' learning power and they all have risks and pitfalls (Carr & Claxton, 2002; Claxton & Carr, 2004). Students' own testimony is useful, but may well be skewed by their desire to support their teachers, or undermined by a lack of clear understanding of the dispositions in question. Teacher assessments may be flawed for similar reasons. And the attempt to articulate stages or levels of progression in habits such as curiosity or empathy are both intrinsically difficult, and complicated still further by their situation-specificity: 'curiosity' will obviously manifest differently for a philosopher and a philatelist.

Changes (or lack of changes) on self-report questionnaires can also be hard to interpret. We have found that a number of changes may be occurring simultaneously that have differing effects on questionnaire score. Students' understanding of the concepts, and of the purposes behind them, may be growing, and this can lead not to overall increases but to increased variability. Growing appreciation of the value of honesty can even cause test scores to drop for a while, masking any real increases in the strength of their learning dispositions (Claxton et al., 2011). Indeed, we have argued that the strengthening of dispositions is itself a multi-faceted process (Claxton & Carr, 2004). Habits may become more *robust*: that is, manifested in the absence of support or guidance. They may become *broader*: manifesting in an increasing array of different domains or settings. And they may also be becoming *richer*: growing in their sophistication and flexibility. All of these factors make it difficult to design instruments that are valid and reliable, at the same time as being practicable and useful to busy teachers (Spencer, Lucas & Claxton, 2012).

It is, of course, relatively straightforward to explore the correlation between students' years of experience with a BLP-like epistemic milieu and their performance on national examinations such as Key Stage 2 Standard Attainments Tests (SATs), GCSEs or A-levels. In the sample of BLP schools that we examined in 2010–2011, we found a degree of variability (as you would expect: schools are complicated places, and much else is happening – for example, change of key personnel – at the same time as the epistemic culture is shifting). In general, though, standardised test results for both primary and secondary schools improved over time at a faster rate than the national average (Claxton et al., 2011). This is reassuring, and in line with a broad range of international research which shows that attention in classes to the processes of

learning leads to improvements in attainment scores (Hattie, Biggs & Purdie, 1996; Watkins, 2010). However, it is vital to remember, when thinking about the evaluation of student outcomes, that improvement in test scores is not the main aim of initiatives such as BLP. Their aim is to improve the transferable learning dispositions of students – to develop their broad epistemic mentality and identity – *without jeopardising their performance on more conventional measures of school success*. It is not surprising that students who have been helped to develop greater resilience, resourcefulness and independence learn school material more efficiently and effectively, and do better on their tests; but we should see this more as a welcome bonus of approaches such as BLP than as the acid test of their validity.

Conclusion

In this paper I have tried to make a case for the possibility, as well as the desirability, of paying greater attention to the nature of the epistemic apprenticeship that schools are providing. I have argued that there is a fast-growing global tendency to cast the fundamental purposes of education in terms of the cultivation of useful, transferable, culturally appropriate ‘character strengths’ or ‘habits of mind’; and that this leads most productively to the search, not for ‘more team games and orchestras’, nor for add-on courses that address ‘moral development’ or ‘learning to learn’, but to a refocusing of the methodology of ‘normal lessons’. Concern with ‘character education’ or ‘key competencies’ should not lead to a neglect of difficult subject-matter or challenging projects, but to the clear recognition that the main reason for grappling with them is to build the skills and the confidence to grapple. (‘Re-inventing the wheel’ is a perfectly sensible activity if the main point is not to produce a wheel but to strengthen the skills and habits of invention.) In the 21st century, young people, I believe, need to develop an appetite for adventure – both physical and cognitive – and to discover the deep pride and satisfaction that comes from putting your intelligent all into meeting a substantial and worthwhile challenge.

Whether that challenge is an elegant essay, a functioning electric circuit, a clean tucked dive or a mathematical proof, matters less than the epistemic growth their pursuit gives rise to. Just as in a gym you have to really push yourself in order to grow fitter, so too in school. The epistemic apprenticeship works when you are doing your utmost – and different kinds of challenges will evoke that level of commitment in different students. Practical and vocational education, scientific and mathematical education, arts and humanities education are all needed, and all need to be esteemed fully, because youngsters have different interests and talents. So fussing about curriculum content – whether we should be teaching *Bleak House* or *Harry Potter* – matters most when we are trying to figure out what will entice students to commit the levels of energy and intelligence that will be repaid in epistemic growth. If it’s a red rowing machine rather than a blue cross-trainer that gets you to jump on and stretch your capacity by working hard – so be it. Once the pleasures of balancing discipline and curiosity, reasoning and imagination, deep silent reading and vigorous discussion begin to become apparent, then the complementary functions of the different pieces of equipment in the mind gym will become relevant. But if the confidence, capacity and appetite for learning have not be strengthened – worse, if your experience of school has served to make you timid and dispirited about learning it is going to be hard to get you to put in the effort.

Educational psychology has often been guilty of casting itself merely as a servant to whatever system of education happens to hold sway. It sometimes accepts too much of the *status quo*. If the politicians are making a fuss about reading, we will do experiments on phonics and dyslexia. If our society is in thrall to the mind-myth of fixed intelligence, we will oblige by inventing ways to measure it. If we are worried about kids who are disruptive or distracted, we will develop technical concepts like ‘self-regulation’ and ‘executive functioning’ that seem to give us a scientific purchase on those problems (and sometimes do).

All this is useful – but we are also entitled to use our psychology to challenge the mainstream. If we want to, we can be in the Vision business, as well as the Fixit industry. Yes, Ed Psych, like all psychology, trades in facts and seeks well-established frameworks for understanding mind and behaviour. And Yes, we cannot derive an Ought from an Is: science cannot tell us what it is right or good to do. But it can open our eyes to possibilities, and show us where folk psychological assumptions may be hampering our efforts to improve. You can't get an Ought from and Is, but you can get a Might. If Lauren Resnick is right, that intelligence is properly seen as 'the sum total of one's habits of mind' (Resnick, 1999); if David Perkins is right, that much of what looks like evidence for intelligence (or the lack of it) is actually a matter of learned dispositions and 'sensitivity [or insensitivity] to occasion' (Perkins & Ritchhart, 2004); if Carol Dweck is right, that our apparent intelligence is powerfully moderated by acquired *beliefs* about intelligence (Dweck, 2000); if Angela Duckworth and Martin Seligman are right, that (acquired) self-discipline accounts much better for school performance than (fixed) IQ (Duckworth & Seligman, 2005): if all this is good psychology, then the idea of helping young people to learn how to be smarter – especially in the way they respond to difficulty and uncertainty – gains a great deal of credibility and practicability. The Is leads to a very interesting Might indeed. And if Lev Vygotsky (1978), Michael Tomasello (1999) and many others are right, that our mental and emotional habits, our beliefs and values, are picked up largely implicitly, simply through the process of trying to fit in with the company we keep, then the habits of teachers and the cultures of schools emerge as being major contributors to the development of young minds: perhaps more powerful even than tuition in algebra and the Tudors. And habits and cultures are things we know can be changed. So the idea of the epistemic apprenticeship as something we can shape for the better, to give all children a more focused, practical and relevant send-off on their journeys through the rest of the 21st century, becomes something to which educational psychology can make a very important contribution. I am pretty sure that Philip Vernon and Bill Wall would have agreed.

References

- Abbott, E.A. (1884, reprinted 1992). *Flatland*. New York: Dover.
- Australian Curriculum, Assessment and Reporting Authority (ACARA) (2013).
http://www.acara.edu.au/verve/_resources/The_Shape_of_the_Australian_Curriculum_v4.pdf
- Alfred Binet (1909). *Modern ideas about children*. Paris: Flammarion.
- Carr, M.A. (2001). *Assessment in early childhood settings: Learning stories*. London: Paul Chapman.
- Carr, M.A. & Claxton, G.L. (2002). Tracking the development of learning dispositions. *Assessment in Education*, 9(1), 9–37.
- Carr, M.A. & Lee, W. (2012). *Learning stories: Constructing learner identities in early education*. London: Sage.
- Chambers, M., Powell, G. & Claxton, G.L. (2004). *Building 101 ways to learning power*. Bristol: TLO Ltd.
- Claxton, G.L. (1999). *Wise up: The challenge of lifelong learning*. London: Bloomsbury/London: Continuum Press.
- Claxton, G.L. (2002). *Building learning power*. Bristol: TLO Ltd.
- Claxton, G.L. (2008). Cultivating positive learning dispositions. In H. Daniels, H. Lauder & J. Porter (Eds.), *Educational theories, cultures and learning: A critical perspective*. London: Routledge.
- Claxton, G.L. (2012). Turning thinking on its head: How bodies make up their minds. *Thinking Skills and Creativity*, 7(2), 78–84.
- Claxton, G.L. & Carr, M.A. (2004). A framework for teaching learning: The dynamics of disposition. *Early Years*, 24(1), 87–97.
- Claxton, G.L., Chambers, M., Powell, G. & Lucas, B. (2011). *The learning powered school: Pioneering 21st century education*. Bristol: TLO Ltd.
- Claxton, G.L. & Lucas, B. (2007). *The creative thinking plan*. London: Pearson.
- Claxton, G.L., Lucas, B. & Webster, R. (2010). *Bodies of knowledge: How the learning sciences could transform practical and vocational learning*. London: The Edge Foundation.
- Claxton, G.L. & Meadows, S. (2009). Brightening up: How children learn to be gifted. In T. Balchin, B. Hymer & D.J. Matthews (Eds.), *The Routledge International Companion to Gifted Education*. Abingdon: Routledge.
- Costa A. & Kallick B. (2000). *Discovering and exploring habits of mind*. Alexandria VA: ASCD.
- Davis, B., Sumara, D. & Luce-Kapler, R. (2000). *Engaging minds: Learning and teaching in a complex world*. Mahwah, NJ: Laurence Erlbaum Associates.
- Delaney, R., Day, L. & Chambers, M. (2009). *Learning power heroes*. Bristol: TLO Ltd.
- Duckworth, A.L. & Allred, K.M. (2012). Temperament in the classroom. In R.L. Shiner & M. Zentner (Eds.), *Handbook of temperament*. New York: Guilford Press.
- Duckworth, A.L., Quinn, P.D. & Tsukayama, E. (2012). What no child left behind leaves behind: The roles of IQ and self-control in predicting standardised achievement tests and report card grades. *Journal of Educational Psychology*, 104(2), 439–451.
- Duckworth, A.L. & Seligman, M.E.P. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science*, 16(12), 939–944.
- Dweck, C.S. (2000). *Self-theories*. Hove: Psychology Press.
- Elmore, R.F. & McLaughlin, M.W. (1988). *Steady work: Policy, practice and the reform of American education*. Washington, DC: National Institute of Education.
- Flink, C., Boggiano, A.K. & Barrett, M. (1990). Controlling teaching strategies: Undermining children's self-determination and performance. *Journal of Personality and Social Psychology*, 59(5), 916–924.
- Frome, P. & Eccles, J. (1998). Parents' influence on children's achievement-related perceptions. *Journal of Personality and Social Psychology*, 74(6), 435–452.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- Gornall, S., Chambers, M. & Claxton, G.L. (2005). *Building learning power in action*. Bristol: TLO Ltd.
- Harvard University Centre on the Developing Child (2010). *Building the brain's 'Air Traffic Control' system: How early experiences shape the development of executive function*. Working Paper 11.
- Hart, S., Dixon, A., Drummond, M.J. & McIntyre, D. (2004). *Learning without limits*. Maidenhead: Open University Press.
- Hattie, J.A. (2009). *Visible learning*. London: Routledge.
- Hattie, J.A. (2012). *Visible learning for teachers*. London: Routledge.
- Hattie, J.A., Biggs, J. & Purdie, N. (1996). Effects of learning skills interventions on student learning: A meta-analysis. *Review of Educational Research*, 66(2), 99–136.
- Hewson, P.W. (1981). A conceptual change approach to learning science. *European Journal of Science Education*, 3(4), 383–396.
- Ketefian S. (1981). Moral reasoning and moral behaviour among selected groups of practising nurses. *Nursing Research*, 30(3), 171–176.

- Lally, P., van Jaarsveld, C.M., Potts, H. & Wardle, J. (2010). How are habits formed: Modelling habit formation in the real world. *European Journal of Social Psychology*, 40(6), 998–1009.
- Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Lucas, B., Claxton, G.L. & Spencer, E. (2013). *Expansive education: Teaching learners for the real world*. Melbourne: Australian Council for Educational Research/Maidenhead: Open University Press.
- Mischel, W., Shoda, Y. & Rodriguez, M. (1989). Delay of gratification in children. *Science*, 244, 933–938.
- Moffitt, T.E. & 12 others (2011). A gradient of childhood self-control predicts health, wealth and public safety. *Proceedings of the National Academy of Sciences*. www.pnas.org/cgi/doi/10.1073/pnas.1010076108
- Mortell, J.M. (2012). *Capturing learning dispositions*. PhD thesis, University of Essex.
- Nuthall, G. (2007). *The hidden lives of learners*. Wellington: NZCER Press.
- Perkins, D.N. (1995). *Outsmarting IQ: The emerging science of learnable intelligence*. New York: Free Press.
- Perkins, D.N. (2009). *Making learning whole: How seven principles of teaching can transform education*. San Francisco: Jossey-Bass.
- Perkins, D.N. & Ritchhart, R. (2004). When is good thinking? In D.Y. Dai & R.J. Sternberg (Eds.), *Motivation, emotion and cognition: Integrative perspectives on intellectual functioning and development*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Peterson, C. & Seligman, M.E.P. (2004). *Character strengths and virtues*. Oxford: Oxford University Press.
- Raine, A. & Yang, Y. (2006). Neural foundations to moral reasoning and antisocial behaviour. *Social, Cognitive and Affective Neuroscience*, 1(3), 203–213.
- Resnick, L. (1999). Making America smarter. *Education Week Century Series*, 18(40), 38–40.
- Ritchhart, R., Church, M. & Morrison, K. (2011). *Making thinking visible: How to promote engagement, understanding and independence for all learners*. San Francisco: Jossey-Bass.
- Rose, D. (2004). The potential of role-model education. *The Encyclopedia of Informal Education*. www.infed.org/biblio/role_model_education.htm.
- Silman, R. (1972). Teaching the medical student to become a doctor. In T. Pateman (Ed.), *Countercourse: A Penguin Educational Special*. London: Penguin.
- Singapore (2009). <https://www.moe.gov.sg/education/education-system/desired-outcomes-of-education>
- Spencer, E., Lucas, B. & Claxton, G.L. (2012). *Progression in creativity: Developing new forms of assessment*. Newcastle: Creativity, Culture and Education.
- Tomasello, M. (1999). *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.
- Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge MA: Harvard University Press.
- Tough, P. (2012). *How children succeed: Grit, curiosity and the hidden power of character*. London: Random House.
- Watkins, C. (2010). Learning, performance and improvement. *Research Matters*. University of London Institute of Education: International Network for School Improvement.
- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.
- Wenger, E., McDermott, R. & Snyder, W. (2002). *Cultivating communities of practice*. Cambridge, MA: Harvard Business School Press.

Appendix 1

POWERFUL LEARNING DISPOSITIONS

These descriptions of the powerful learner can be used to underwrite a variety of tools and prompts:

- a self-report questionnaire;
- an observation schedule for use by teachers, students and researchers;
- a basis for identifying linguistic prompts and nudges that can be used by teachers and coaches to develop each disposition.

The 16 characteristics below are based on both research in the learning sciences, and teachers' judgements about the 'habits of mind'. Taken together, they seem to describe the mindset of a 'powerful learner' in a way that many teachers find both plausible and fruitful.

RESILIENCE – emotional strength

1. **Inquisitive:** has a questioning and positive attitude to learning.
2. **Persistent:** stays determined, positive and patient in the face of difficulty or mistakes.
3. **Adventurous:** willing to risk and 'have a go'; up for a new challenge.
4. **Focused:** observant, concentrates well, ignores distractions, becomes engrossed.

RESOURCEFULNESS – cognitive capability

5. **Imaginative:** comes up with creative ideas and possibilities; visualises.
6. **Connecting:** looks for links and relationships; likes to 'hook things up'; uses metaphor.
7. **Crafting:** keen to work on improving products; practising and developing skills.
8. **Capitalising:** makes good use of resources, tools and materials.

REFLECTION – strategic awareness

9. **Methodical:** well-organised; thinks things through carefully.
10. **Self-evaluative:** makes honest and accurate judgements about 'how it's going'.
11. **Self-aware:** knows their own strengths, styles and interests as a learner.
12. **Transferring:** looks for other applications and lessons for the future.

RELATING – social sophistication

13. **Collaborative:** a good team-player; helps groups to work well together.
14. **Open-minded:** asks for, listens to and makes good use of information, feedback and advice.
15. **Independent:** able to 'stand their ground'; shows initiative.
16. **Empathic:** understands others; offers helpful feedback and suggestions; receptive and imitative.

LEARNING POWER QUESTIONNAIRE (Version 1, LPQ-1)

This is a quiz to find out how you see yourself when you are trying to do things that are new or difficult. There are 16 statements. Look at each one and think how true this is of you when you are learning new things. This includes things you are learning for your own interest out of school, as well as in lessons. Of course we all vary, but try to choose the answer that is closest to you in general. If you think a statement is rarely or never true of you, circle the 1. If it is occasionally true, circle 2. If you think it is sometimes true, circle 3. If you are quite often like that, circle 4. And if the statement is true very often or always, circle 5.

Remember:

1 = rarely (or never)

2 = occasionally

3 = sometimes

4 = quite often

5 = very often (or always)

Date.....

Name.....

Class.....

- | | | | | | |
|---|---|---|---|---|---|
| 1. I think I can learn most things if I try | 1 | 2 | 3 | 4 | 5 |
| 2. I'll stick at something difficult till I've got it | 1 | 2 | 3 | 4 | 5 |
| 3. I'm willing to have a go at something new | 1 | 2 | 3 | 4 | 5 |
| 4. I get completely absorbed when I'm trying to master new things | 1 | 2 | 3 | 4 | 5 |
| 5. My brain comes up with lots of creative ideas | 1 | 2 | 3 | 4 | 5 |
| 6. I like making links between things in my head | 1 | 2 | 3 | 4 | 5 |
| 7. I enjoy working on improving what I've done | 1 | 2 | 3 | 4 | 5 |
| 8. I make good use of things around me to help me learn | 1 | 2 | 3 | 4 | 5 |
| 9. I am well-organised and careful when I'm learning | 1 | 2 | 3 | 4 | 5 |
| 10. I'm honest with myself about how well I'm doing | 1 | 2 | 3 | 4 | 5 |
| 11. I'm well aware how I learn best | 1 | 2 | 3 | 4 | 5 |
| 12. I like to think how I can apply what I'm learning elsewhere | 1 | 2 | 3 | 4 | 5 |
| 13. I enjoy learning new things with other people | 1 | 2 | 3 | 4 | 5 |
| 14. I'm ready to accept feedback and advice from others | 1 | 2 | 3 | 4 | 5 |
| 15. I'm happy to stick up for what I think in a discussion | 1 | 2 | 3 | 4 | 5 |
| 16. I help others see how they could improve | 1 | 2 | 3 | 4 | 5 |

NB: This version of the LPQ is somewhat different from the one rigorously trialled and validated by Judith Mortell (Mortell, 2012). It is recommended for formative use only.

LPQ OBSERVATION SCHEDULE FOR TEACHERS AND RESEARCHERS

Teacher's name/initials.....

Student name.....

Class.....

Date.....

For each student, please give a rating, 1 to 5, on each of the 16 qualities of mind listed below. Especially think about the student when they are facing something new or challenging.

- 1 = they are rarely or never like this
- 2 = they are occasionally like this
- 3 = they are sometimes like this
- 4 = they are quite often like this
- 5 = they are very often or always like this

1. **Inquisitive:** generally shows a questioning and positive attitude to learning.
2. **Persistent:** stays determined and positive in the face of difficulty or mistakes.
3. **Adventurous:** is willing to risk and 'have a go' when facing a new challenge.
4. **Focused:** concentrates, ignores distractions, and quickly becomes engrossed.
5. **Imaginative:** easily comes up with creative ideas and possibilities.
6. **Connecting:** looks for links and relationships, likes to 'hook things up'.
7. **Crafting:** is keen to work hard on improving products and developing skills.
8. **Capitalising:** makes good use of resources, tools and materials to support their learning.
9. **Methodical:** is well-organised and thinks things through carefully.
10. **Self-evaluative:** makes honest, accurate judgements for themselves about 'how it's going'.
11. **Self-aware:** knows their own strengths, styles and interests as a learner.
12. **Transferring:** shows evidence of looking for other applications and lessons for the future.
13. **Collaborative:** articulates and defends their own thoughts and ideas in discussion.
14. **Open-minded:** asks for, accepts and makes good use of feedback, advice and support.
15. **Independent:** explains their ideas clearly and confidently and can take the lead in a group.
16. **Empathic:** is good at understanding others, and offering helpful feedback and suggestions.

LEARNING DISPOSITIONS – COACHING PROMPTS

Below are some illustrations of ways of prompting and ‘nudging’ students towards using and developing the 16 qualities of mind during classroom activities. Please bear these in mind and use them consciously as you go around helping students with their work.

Inquisitive: ‘That’s curious’, ‘What’s odd about that?’, ‘What does that make you wonder?’, ‘What do you want to find out?’

Persistent: ‘Don’t give up’, ‘You can do it if you try’, ‘This is hard; it will take time to figure it out’, ‘Nothing worthwhile is easy’

Adventurous: ‘Just give it a try’, ‘How could you make that more interesting / exciting / risky?’, ‘Choose a topic that is going to stretch you’

Focused: ‘Don’t mind what they’re doing’, ‘Really get into it’, ‘What would help you concentrate more?’

Imaginative: ‘How else could you do that?’, ‘Free up your imagination a bit’, ‘Just let your brain bubble up with ideas for a minute’

Connecting: ‘What does that remind you of?’, ‘What do you know that might help?’, ‘What would be a good analogy for that?’

Crafting: ‘What do you need to practise a bit more?’, ‘What would you need to do to improve that?’, ‘What could you tinker with?’

Capitalising: ‘What could you use to help with that?’, ‘What could you use as a tool to help you?’, ‘What are you going to need?’

Methodical: ‘What would it be useful to think about before you start?’, ‘What would happen if you did that?’

Self-evaluative: ‘Tell me about that’, ‘What are you not so pleased with?’, ‘What do you like best about that?’, ‘How would you do it differently next time?’, ‘What would “even better” look like?’

Self-aware: ‘Does this way of working play to your strengths?’, ‘How could you organise things to help you learn better?’, ‘What “qualities of mind” would it help you to strengthen?’

Transferring: ‘Where else could you make use of that?’, ‘Where could you apply what you’ve just learned?’, ‘Could you use that in a different subject?’

Collaborative: ‘How could you contribute more?’, ‘What are your strengths as a team-player?’, ‘How could you help the group work better?’

Open-minded: ‘Who would you like to give you feedback on that?’, ‘How are you going to make use of that advice?’, ‘Just think about what Eric said...’

Independent: ‘Can you explain that a bit more clearly?’, ‘You don’t have to go with the crowd’, ‘What would you suggest if you were in charge?’, ‘If you were to take the initiative, what would you do?’

Empathic: ‘Can you tell Ruby about her work in a way she can hear?’, ‘How do you think Josh is feeling about his work?’, ‘Have you noticed anyone using good tricks or strategies that might help you learn that?’

Author's Notes

- 1 I would like to thank all those who have collaborated with me on the work described in this paper, especially my colleagues and co-authors Maryl Chambers, Graham Powell and Bill Lucas; TLO consultants Leanne Day, Sue Herdman and Steve Watson; Judith Mortell, who developed and trialled the formal Learning Power Questionnaires for her PhD; and the principals and teachers of all the schools that took part in the research evaluation project that gave rise to our book *The Learning Powered School* (Claxton et al., 2011).
- 2 Alfred Binet (1909).
- 3 The title of Lave and Wenger's (1991) seminal text on communities of practice is *Situated Learning: Legitimate Peripheral Participation*.
- 4 Quoted in David Perkins (1995).
- 5 The English Key Stage 3 curriculum.
- 6 New Zealand National Curriculum.
- 7 Royal Society of Arts 'Opening Minds' project; and the OECD.
- 8 Peterson & Seligman op. cit.
- 9 Perkins & Ritchhart op. cit.; Claxton op. cit.
- 10 Costa & Kallick op. cit.
- 11 An Early Years programme called Tools of the Mind has shown remarkable success in building self-control through peer play: see Paul Tough (2012).
- 12 See: www.winchester.ac.uk/realworldlearning, and www.expansiveeducation.net
- 13 Further details of the BLP seeds, frameworks, tools and languages, as well as a range of resources and publications, can be found at www.buildinglearningpower.co.uk. Many aspects are described more fully in Claxton (2002) and Claxton et al. (2011).
- 14 I should be clear that this version, which I call BLP 2.0, is a work-in-progress. It is a development from the original framework used in several of the earlier BLP publications (e.g. Claxton, 2002; Chambers, Powell & Claxton, 2004; Gornall, Chambers & Claxton, 2005; Delaney, Day & Chambers, 2009), which attempts to include more explicitly the concepts of risk-taking and craftsmanship, and to simplify some of rather hifalutin language of the earlier version. But it is not quite the same as the framework that emerged from the experimental trialling of the LPQ (Mortell 2012), which we might call BLP 2.1. I have included this material here as a contribution to the 'creative commons' of expansive education, and to illustrate some of our more details thinking.

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