

New kinds of smart

Emerging thinking about what it is to be intelligent today



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The Talent Foundation

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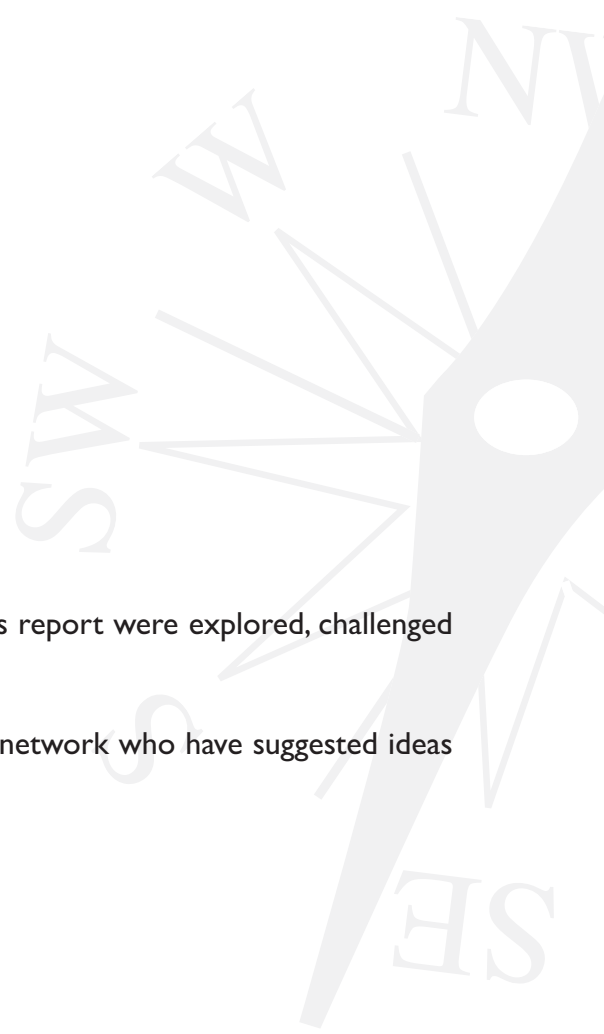
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Executive Summary

IQ and other traditional measures of intelligence only account for about a quarter of the factors which characterise what it is to be smart in today's rapidly changing world. Yet in workplaces and schools, IQ and its derivatives still hold undue sway, exerting a pernicious influence on both the content of learning and on society's view of what it is to be successful.

While we recognise that there are some important general cognitive abilities which we need to be able to get on in life – reasoning, abstract thinking and linguistic or mathematical skill, for example – there is a growing amount of evidence to suggest that this is a much smaller part of what is required to be smart than has previously been acknowledged.

We believe that, in a rapidly changing world, the context of any activity is very important. Sometimes, for example, it is smart to be resilient and keep going, while on other occasions a more reflective approach may mean taking a break and returning refreshed later.

We have consequently developed a number of elements to broaden our understanding of what it is to be smart. These encompass such diverse ideas as intuitive thinking, questioning, creativity, resilience, reflective practice and goal orientation.

Each individual element has been chosen, among other reasons, because:

- there is research evidence to support its validity
- there is a centre or group dedicated to its study
- it is simple and clear
- there is evidence that you can better at it.

In selecting our “smart elements” we have been influenced by new thinking in a number of areas. We have been particularly interested in the idea of practical intelligence, in the importance of context, in work being done to understand the ways complex adaptive systems function and in the notion of collaborative or group intelligence.

We believe that there is evidence to suggest that we can cultivate certain attributes of mind which will help individuals to live their lives in ways which are smarter.

We think that we have now marshalled enough of an overview of a different approach to being smart to merit:

- a serious debate, and
- some rigorous testing both in the workplace and in schools and colleges.

This work will now start in earnest and we will be looking for other partners to take it forward with us.



I. Background

We believe that there is an abundance, not a scarcity, of talent. The so-called “war for talent” is an unhelpful metaphor which suggests an outdated and limiting view of what it is to be smart today. It implies that talent is somehow a fixed commodity which you either possess or lack. The phrase suggests an approach to measuring human endeavour which draws too much on early twentieth century indicators of performance like Intelligence Quotient (IQ).

The need for new thinking

We think that it is time to move on and explore new thinking about intelligence or, as we will largely refer to it, “smart”. By “smart” we mean “being able to successfully navigate whatever system or context you are in. This involves making the best of all available resources - your own and those of people around you - to maximise the opportunities and overcome the constraints of the environment in which you find yourself.

We use “smart” as a contemporary synonym for “intelligent”, although we are aware that both words carry much baggage. From time to time we also use the word “talent”. Nearly the same in meaning as “smart”, talent (or “talented” to be more precise) seems to us to focus more on the individual and less on the external environmental through which smart people can adeptly navigate.

When people appear not to be fulfilling their potential, our assumption is not that they are stupid or even that they are not trying hard enough. We prefer to think that, in many situations, it is much more likely that the approach they are using is simply not fit for the task in hand or that the mind-set they are adopting may be an unhelpful one. They may, if you like, lack the right map, the best “compass” or a robust enough “ship”.

Recently the Talent Foundation has begun to explore the idea that much unhappiness stems from our current partial understanding of what it is to be smart these days. Just one recent example of this can be found in a recent report from Unicef¹ which showed that the UK’s children are the least happy of the twenty-one “developed” nations in the world.

It seems likely that many people, adults and children, assume that they are much less intelligent than they are, and perform less well as a consequence. The prevailing ‘success paradigm’ is that smart people are quick, rational, decisive, serious-minded, outward-focused, gregarious and probably good at IQ tests. Being smart is largely a heroic concept with little or no attention paid to social context. At schools pupils are sorted into top, middle and bottom sets using only academic criteria. And many large organisations scrutinise their people, using a relatively limited set of measures, to be sure that they have spotted the “high-fliers” or “fast-trackers”. These are the accepted pathways to success. Individuals who do not display the kind of attributes commonly associated with being smart, unless they are very resilient, may feel that they are constantly bumping up against someone-else’s glass ceiling. They may suffer stress or lowered self-esteem along with reduced motivation as a consequence and they are likely to perform less well. In short, the “IQ approach” still dominates our educational structures.

This report is just a beginning. In it we make a case for a re-appraisal of the way we think about intelligence and suggest some ways in which this could be further explored and made practically useful.

We have deliberately focused our attentions on the workplace – whether in its traditional employed sense or in the increasingly common portfolio lives – as this is where the Talent Foundation’s focus lies. But much of what we are saying is transferable into everyday living.

With this in mind we set out a year ago to explore some of today’s emerging new thinking about intelligence. We have teamed up with Edge, another charitable foundation, in our exploration of this complex and exciting territory. Edge believes passionately that too much emphasis is put on academic success rather than exploring the ways in which various kinds of practical learning can help young people to be more successful.

Methods of working

We have read widely, searched the Web and our asked a wide network of contacts for new thinking. At the core of our working method has been a panel of experts and expert practitioners (the advisory board listed on the inside cover of this report). The panel combines the academic rigour of professorial input with those whose day jobs are the development of talent and who can test new ideas for their relevance. This group has come together on a number occasions to explore, shape and validate our emerging thinking.

Initially it seemed fruitful to develop a new kind of intelligence, one that would be a genuine alternative to IQ. But, after exploring the literature, it became clear that there are already many interesting candidates in existence. Some of these are more valid predictors of success in life, but are also very complex. Many of them, while valid, are difficult to assess reliably.

IQ exerts such a strong influence when it comes to thinking about intelligence that we concluded it would be silly to try and find an alternative brand in a crowded field. Instead we accept that what IQ measures is a legitimate portion of what it is to be smart, but only a small one, about a quarter.

Hence the title of our next chapter:

The other 75% - going beyond IQ.



2. The other 75% - going beyond IQ

Are ideas like multiple intelligence and emotional intelligence just the latest fads of a liberal educational establishment wary of “tried and tested” indicators like IQ? Does it matter that there is such a sharp divide in our society today between “book smarts” and “street smarts”, those who excel at academic matters and those who achieve success in more practical ways?

At the Talent Foundation and Edge we believe that, if it were possible to provide some credible new approaches to intelligence then more people would develop more of their talents at school, at college, at university, in the workplace and in the wider world.

This short paper seeks to present the beginnings of a justification for such a belief.

The pernicious influence of IQ

Surprisingly for such an influential measure of intelligence, it turns out that IQ is a relatively poor predictor of being smart, accounting for only some 25% of performance, the rest being accounted for by other factors, (see foot-note). In short IQ is a flawed indicator of success in life or learning. We therefore need to explore some of the other ingredients that go into being smart and successful.

IQ as a measure is fiendishly and appealingly simple.

$$\frac{\text{Mental age} \times 100}{\text{Actual age}} = \text{IQ score}$$

Something about its clarity, the fact that it has just one score, a number above or below 100, renders it unassailable when it comes to measuring and intelligibility.

The approach we have adopted in this paper is to focus on what we are learning about how you can get smarter – whether assessed via IQ tests or in other ways -rather than seek to suggest a new way of measuring how smart you are.

IQ has nothing to offer formatively or developmentally. For if you want to improve your IQ score all you can really do is practise by taking lots of IQ tests so that you get better at doing IQ tests!

But why all this concern with IQ? The answer is simple. As the “brand leader” when it comes to measures of intelligence, IQ and its many derivatives exert a pernicious influence on every aspect of society. It implies that intelligence is a fixed entity and that any improvements are likely to be limited. Consequently it de-motivates many and damages the self-esteem of others.

IQ measures only a narrow, largely academic, range of cognitive abilities. Those abilities or areas of interest which fall outside its chosen areas, like social intelligence and practical intelligence, are likely to be seen as at best optional and at worst marginal.

Specifically in terms of predicting both educational and work-place performance research reveals the correlation (r) to be about 0.5. Statistically a correlation coefficient of 0.5 means that the overlap between IQ and performance is 25% (i.e. 5²), leaving the remainder of performance accounted for by factors other than IQ.

In schools, while very few pupils actually take IQ tests, summative examinations, owing much to the “IQ mode”, still dominate formal education. And it is “success” or “failure” at these examinations that dominates most people’s self-image as a learner.

IQ offers a distorted approach to what is involved in being an effective learner; for its questions are de-contextualised, unrelated to the world that most people know, with only one acceptable solution and with only one acceptable method of solving them.

The idea of being smart

The study of what it is to be smart – the development of the concept of intelligence - is a relatively young science stretching back for only a hundred years or so. It is a deeply political topic. For what nations define as smart normally ends up being rewarded and taught at work and in school.

As thinking has developed, there have been two broad strands of common agreement. Most researchers agree that being smart involves both the capacity to be able to learn from experience and the ability to adapt to the surrounding environment.

Once we began to explore some “new kinds of smart” a number of lines of enquiry presented themselves which we have expressed as questions:

- Is it about general or specific abilities (or both)?
- What is the scope of “smart”?
- Is it fixed or learnable?
- Is it about abilities or is it more to do with the cultivation of certain habits of mind?
- To what extent can you “re-programme” your mind to function smarter?
- Is it about formal knowledge or tacit know-how?
- Is it about thinking or feeling or both?
- Is it academic or practical?
- Is it context-specific?
- What can we learn from the way complex adaptive systems function?
- Is it about individuals or groups?
- Is it fast or slow?

Looking at each of these questions in turn, it is clear that there is currently a quiet revolution going on in our thinking about what it is to be smart.

General or specific

It was Charles Spearman² who first suggested that there were two aspects to intelligence. One is general or “g” and the other is specific or “s”. Spearman’s g is a sort of general-purpose cognitive ability, which accounts for variations in performance across activities of a very different character. While estimates vary, most agree that such a g might account for 50/60% of the variation, with more s factors – task or environment, for example - explaining the rest of it. Another way of thinking about g would be to see it as a kind of mental energy which is largely fixed.

Harmless as the idea of s and g may sound, the nub of the g approach is that, as it is assumed that much of an individual’s general cognitive ability is inherited, there is much less chance for people to influence how smart they are. You are effectively either born a sheep or a goat.

Nevertheless we conclude that there are some general cognitive abilities such as:

- reasoning
- problem-solving
- abstract thinking
- linguistic and mathematical skill
- spatial awareness,

which common-sense suggests are part of what it is to be smart. But these are only part of what is involved.

Interestingly even one of IQ's strongest proponents, Professor Linda Gottfredson, admits that "there are many kinds of talent, many kinds of mental ability and many other aspects of social personality that influence a person's chances of happiness and success."³

Scope

When Howard Gardner introduced his theory of multiple intelligences in the 1980s, the scope of intelligence was expanded at a stroke. From what had been a largely unitary concept, initially seven, and finally eight different components were boldly described - linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal and naturalist. Determining the scope of intelligence at the same time influences what we value in society. As Gardner put it: "The capacity to know oneself and to know others is an inalienable part of the human condition as is the capacity to know objects or sounds, and it deserves to be investigated no less than these other less charged forms"⁴.

In fact Gardner was not the first to see a multiplicity of ways in which people could be smart. In the 1920s Edward Thorndike⁵ suggested three aspects – abstract, mechanical and what he called "social" intelligence. By social he meant the ability to understand others and to act and behave wisely. This is close to Gardner's "interpersonal" intelligence.

Perhaps more controversially in the 1960s J P Guilford contended that intelligence consisted of 150 separate strands in the clearest possible pre-cursor to Gardner's thinking. According to Guilford⁶, intelligence was too complex to be covered by a few primary mental abilities, much less by a single g-factor value or IQ score. Instead Guilford's Structure of Intellect theory saw intelligence as made up of operations, contents, and products. There are five kinds of "operations", six kinds of "products" and five kinds of "contents", making 150 in all. By content, he meant visual, auditory, symbolic, semantic and behavioural. Both Guilford and Gardner have stimulated considerable academic debate. So, for example, many do not consider the criteria for Gardner's eight intelligences to be rigorous enough and many see the near impossibility of reliably measuring them a barrier to accepting his ideas.

Recently Howard Gardner has moved on from multiple intelligences to suggest that we should consider the idea of multiple minds. In a lecture at the RSA⁷ he proposed that five kinds of mind will characterise an individual who is prepared for the future. Three of these are cognitive – the disciplined mind, the synthesising mind and the creating mind – and two deal with the human sphere – the respectful mind and the ethical mind.

When he talks of the disciplined mind Gardner refers to the development of mastery in certain subjects at school - mathematics, science, history and an art form, for example - and the subsequent development as an adult of certain ways of thinking. The synthesising mind is very much a creature of our information-rich times and, as its name suggests, involves the smart selection of information and its synthesis into useful knowledge. The creating mind centres on the capacity and temperament for innovation.

The respectful mind and the ethical mind are something of a departure from Gardner's previous kinds of thinking, for they offer a speculative analysis of what will be needed in future based on a particular view of the human condition. The respectful mind implies a need for tolerance and mutual understanding, taking us into a social and societal dimension. And the ethical mind suggests a degree of abstraction, with individuals being able to think both about the kind of person they would like to become and the kind of world they would like to leave for future generations.

This kind of approach is excitingly different from traditional notions of intelligence and much more akin to our own more fluid deliberations encapsulated in our definition of what it is to be smart: "being able to successfully navigate whatever system or context you are in. This involves making the best of all available resources - your own and those of people around you - to maximise the opportunities and overcome the constraints of the environment you find yourself in." Of course even this attempt to define "smart" begs more questions. How does one know that one has 'successfully navigated' a situation? Is it when, for example, the problem is "solved", when judgment is "made" or when happiness is "achieved"?!

We are sure that the scope of what it is to be smart is broad and that intelligence is more complex and multi-faceted than most schools and most work-places imagine.

Fixed or learnable

A large part of the inheritance of IQ has been the assumption that how smart you are is largely fixed at birth. But two strands of recent thinking challenge this.

The first derives from neuroscience and is best summed up by the word "plasticity", the idea that the brain's neurological circuits are adaptable and capable of "learning" new functions. So, for example, it is clear that we can grow new neural connections and learn new things even when we are older.

The second, from the realm of psychology, has been led by researchers like David Perkins who has advanced a powerful case for the skills and attitudes which underlies what he calls "learnable intelligence"⁸. Perkins breaks intelligence down into three forms; neurological (the biological aspects of the brain an individual is born with), specialized (the specific skills and knowledge acquired over time) and reflective (the ability to manage and develop mental habits and so become smarter). In a sense the first two of these broadly correspond to Spearman's g and s, while the third breaks new ground.

Whether intelligence is fixed or malleable really does matter. For a start it hugely influences an individual's attitude to failure and therefore to experimentation. If you believe intelligence is fixed then your attitude to failing is likely to be that you are being stupid. Whereas if you see intelligence as expandable, then mistakes become part of the science of self-improvement; they have a real value in helping you to reflect on how you can adopt new learning strategies. We also know that students who are taught a belief in malleable intelligence deal with difficulty better; they are also more likely to take risks

We believe that it is possible to learn how to be smarter. Indeed we have learnability as a key criterion for selecting the new kinds of smart that we describe on page 25.

Abilities or habits

Parallel to the idea of learnable intelligence is a challenge to the idea that intelligence is all about abilities. For analysis of intelligent behaviour in the real world suggests that it may make more sense to see intelligence in terms of a series of behaviours which, if viewed as whole, might begin to describe what an intelligent person actually does. Work from three areas of research has helped to inform our thinking here – habits of mind, locus of control and positive psychology/well-being – and we conclude that there is much to be learned from each of them that is relevant to an exploration of what it is to be smart.

Arthur Costa and Bena Kallick⁹ in their work in American schools have led the field in thinking about habits of mind and their sixteen key habits are listed below in Figure 1.

Figure 1 - 16 Habits of Mind (Costa and Kallick, 2000)

1. Persisting
2. Thinking and communicating with clarity and precision
3. Managing impulsivity
4. Gathering data through all senses
5. Listening with understanding and empathy
6. Creating, imagining, innovating
7. Thinking flexibly
8. Responding with wonderment and awe
9. Thinking about thinking (meta-cognition)
10. Taking responsible risks
11. Striving for accuracy
12. Finding humour
13. Questioning and posing problems
14. Thinking interdependently
15. Applying past knowledge to new situations
16. Remaining open to continuous learning

Allied to a number of these habits, especially number 9 - meta-cognition - is the growing evidence that people who can think about the process of thinking or learning tend to become more expert at it. In a school setting there is now good evidence that learners who understand more about learning how to learn perform better in many areas and this has been summarised by the UK's School Improvement Network¹⁰ and in the work of the UK's Campaign for Learning.

Ellen Langer in part picks up on two elements - 7 and 8 - with her concept of mindfulness¹¹. She shows how smart people adopt an almost naïve playfulness in exploring situations. And, in a school context, Lauren Resnick¹² has shown how, without two key habits of mind - resourcefulness and resilience (similar to thinking flexibly and persisting in Figure 1) - students can easily perform in ways that would suggest they are less smart than they really are, suffering from what has been termed "learned helplessness".

In 2001, Bill Lucas sought to bring together some of the kinds of elements cited by Costa and Kallick (and others) into a framework for managers by positioning a set of elements under 5 "Rs" - Resourcefulness, Remembering, Resilience, Reflectiveness and Responsiveness¹³. This built on work undertaken by Guy Claxton in his thinking about the "curriculum of lifelong learning". In 2002, Claxton introduced the notion of "building learning power"¹⁴ with a detailed break-down of the different "learning muscles" which a smart learner in school might seek to develop. These are listed in Figure 2 on the next page.

Of course, in the real world our ability to be smart depends on the degree to which we think we are in control of events. Put crudely, if you always fail a particular test, you are unlikely to want to persevere. And if you do not keep trying your performance will diminish (and you will in effect be less intelligent). In the 1960s Julian Rotter¹⁵ called this idea the "locus of control", a way of looking at a person's generalized beliefs concerning who or what influences things.

People with a strong internal locus of control believe that the responsibility for whether or not they are successful ultimately lies with them. They believe that success or failure is mainly due to their own efforts. In contrast, those with an external locus of control believe that most of what happens in life is controlled by luck, chance, or powerful others. Consequently, they see little impact of their own efforts on their likely progress.

Common sense suggests that an individual's locus of control is bound to impact on their ability to keep on being smart in a variety of different circumstances over time.

Figure 2 – The 4 Rs of Learning Power (Claxton, 2002)

<p>Resilience</p> <p>Absorption</p> <p>Managing distractions</p> <p>Noticing</p> <p>Perseverance</p>	<p>Being ready, willing and able to lock on to learning</p> <p>Flow, the pleasure of being rapt in learning</p> <p>Recognising and reducing distractions</p> <p>Really sensing what’s out there</p> <p>Stickability; tolerating the feelings of learning</p>
<p>Resourcefulness</p> <p>Questioning</p> <p>Making links</p> <p>Imagining</p> <p>Reasoning</p> <p>Capitalising</p>	<p>Being ready, willing and able to learn in different ways</p> <p>Getting below the surface; playing with situations</p> <p>Seeking coherence, relevance and meaning</p> <p>Using the mind’s eye as a learning theatre</p> <p>Thinking rigorously and methodically</p> <p>Making good use of resources</p>
<p>Reflectiveness</p> <p>Planning</p> <p>Revising</p> <p>Distilling</p> <p>Meta-learning</p>	<p>Being ready, willing and able to become more strategic about learning</p> <p>Working learning out in advance</p> <p>Monitoring and adapting along the way</p> <p>Drawing out the lessons from experience</p> <p>Understanding learning, and yourself as a learner</p>
<p>Reciprocity</p> <p>Interdependence</p> <p>Collaboration</p> <p>Empathy and listening</p> <p>Imitation</p>	<p>Being ready, willing and able to learn alone and with others</p> <p>Balancing self-reliance and sociability</p> <p>The skills of learning with others</p> <p>Getting inside others’ minds</p> <p>Picking up others’ habits and values</p>

And, most recently, Martin Seligman¹⁶ and others from the positive psychology movement have begun to be even more forensic in anatomising the kinds of smart mind-sets which are likely to help individuals succeed. Psychologists have started to see the many ways in which individuals with a positive outlook can influence their chances of success in life. Of paramount importance is explanatory style, the way people account for things that happen to them. The more we can see setbacks as nothing personal, just temporary and very specific to one area of our life, the smarter we are likely to act. It would seem logical to suggest that, the more people are able to take responsibility for their own actions and learn how to react positively to things that happen to them, the happier society will become.

The various cognitive therapies which have grown up to help individuals to change their mind sets have an even simpler alternative treatment that has recently become available - smart drugs. The first generation of these cognitive enhancing drugs included Prozac, Ritalin and Modafinil. But there are many others being created. The UK Government's chief scientific adviser, Sir David King¹⁷ recently argued that restrictions should be removed on these drugs so that a much wider section of the population can benefit from them.

This poses some really interesting questions for us. We accept caffeine, vitamins and fishy oils as legitimate enhancements to our diet. Do we also accept brain enhancing drugs (currently prescribed to those with certain medical conditions) that may, for the duration that you take them, make you smarter? Our view is that we would not want to rule out anything that might help, but that our focus is on what we may be able to do without the assistance of drugs. For, while a new generation of drugs may temporarily enhance cognitive ability and self-belief, such changes are currently unlikely to be sustainable.

There is much to digest in this section and we have not attempted to do it justice here, given our view that the use of drugs is an interesting but peripheral part of this particular study. And we are sure that all of the ideas about mind-set that we have been outlining are valuable and helpful. Smart people learn how to cultivate certain habits of mind. They are interested in the process of thinking and learning - meta-learning and meta-thinking. Smart people take responsibility for their own actions and recognise the power of positive mind-sets. As Hamlet put it: "There is nothing either good or bad but thinking makes it so".

Formal or tacit

To be able to do well in most kinds of intelligence tests people need to be able to bring things to the surface of their minds – into conscious awareness. Yet much, arguably the majority of what we do, exists at the tacit level. It was Michael Polanyi who first articulated the idea of tacit knowledge. As he put it: "we can know more than we can tell"¹⁸. Polanyi called this pre-logical phase of knowing 'tacit knowledge'. Tacit knowledge involves a range of conceptual and sensory information and images which can be brought to bear in an attempt to make sense of something. Tacit knowledge is clearly a major element of intelligence and behaviour and one increasingly recognized in contemporary thinking about organizational performance. Tacit knowledge has also been largely absent from conceptions of intelligence until recent times.

Related to tacit knowledge is another kind of below the surface knowing, intuition. Increasingly it seems likely that this is also an important aspect of human performance which should not be overlooked when considering intelligence. Successful people take important decisions about their lives using both their intellect and informed intuition.

Thinking or feeling

EQ or emotional intelligence, arguably the most effective challenge to IQ to date, was popularized by Daniel Goleman in the 1990s drawing on research work already being undertaken by others like Jack Mayer and Peter Salovey¹⁹. EQ explores the common sense notion that, as well as being book smart, you also need to be people smart if you are going to get on in life.

Goleman argues that part of the success not accounted for by traditional IQ measures could be to with emotional intelligence: “abilities such as being able to motivate oneself and persist in the face of frustrations; to control impulses and delay gratification; to regulate one’s moods and keep distress from swamping the ability to think; to empathize and to hope”²⁰.

We are sure that it is important to understand the affective domain of feelings and emotions as well as the more traditional cognitive approaches. EQ is well-established in the popular imagination and so we will spend less time on here it here.

Academic or practical

In much of the western world, being smart (or intelligent) is almost synonymous for being academic. IQ has much to answer for here for the way it goes about testing ability. Consider this typical question:

Which of these words doesn’t belong in the group: clam, pig, oven, rose?

The “correct” answer is the oven, because the rest are living things. But you could make a good case for the rose, as the others relate to making dinner. Equally you might say it should be the clam, since clams live in the water, and the rest exist on land.

There are, of course various associations with the word “academic” including “clever” or “bright” (both positive for most people) and “precise” or “detached from the practical world” (both less positive).

Ironically the inventor of IQ, or at least the person behind its early prototypes, Alfred Binet, might well be turning in his grave at the way IQ tests have been developed. For Binet saw the core of intelligence as being “judgment, otherwise called good sense, practical sense; initiative, the faculty of adapting oneself to circumstances”²¹. And Binet argued for the broadest range of questions to help to establish the abilities he was looking for.

In the last twenty years or so there has been growing interest in the notion of practical intelligence. This has centred on the work of Robert Sternberg and members of the Sternberg Research Group. Sternberg’s defines practical intelligence as “what most people call common sense. It is the ability to adapt, to shape, and select everyday environments”²².

A number of distinguished academic researchers, principal among them Sternberg himself, have made a compelling case for the existence of practical intelligence. Other distinguished researchers pressing its claim include Professors Richard Wagner and George Forsyth. In defining practical intelligence, Sternberg started by looking at those aspects of intelligence which seemed to contribute to success in life.

He identified three:

1. Analytical	The ability to solve problems and judge ideas
2. Creative	The ability to formulate new or clever solutions to problems, and
3. Practical	The ability to use your ideas and implement them effectively, to turn theory into practice.

Successful people, Sternberg argues, know how to use each of these three aspects of their intelligence. Much of Sternberg’s approach to defining practical intelligence involves setting it against academic intelligence. With Wagner, Sternberg helpfully reminds us of the distinction between academic and practical tasks²³, as set out in Figure 3 below.

Figure 3 – Academic and practical tasks	
Academic problems tend to:	Practical problems tend to:
<ul style="list-style-type: none"> • Be formulated by other people • Be well-defined • Be complete • Possess only one single answer • Possess only a single method of obtaining the right answer • Be disembodied from ordinary experience • Be of little or no intrinsic interest 	<ul style="list-style-type: none"> • Require problem recognition and formulation • Be ill-defined • Require information-seeking • Possible multiple acceptable solutions • Allow multiple paths to solutions • Be embedded in and require prior everyday experience • Require motivation and personal involvement
Adapted from Sternberg and Wagner (1993)	

Sternberg continues to seek to define practical intelligence. In particular, he has begun to focus on tacit knowledge, which he describes as “experience-based knowledge relevant to solving problems”. Indeed, with Richard Wagner, he has invented a *Tacit knowledge inventory for managers*²⁴ which measures many of the elements of what Sternberg argues are central to practical intelligence.

Charles Handy has also long argued that there is such a thing as practical intelligence²⁵, or as he puts it “the ability to recognise what needs to be done and what can be done”.

In education there are a small number of current experiments at creating a curriculum in which practical intelligence might be nurtured. In the USA Project Zero’s Practical Intelligence for School initiative, collaboration between Professor Howard Gardner at Harvard and Professor Robert Sternberg at Yale universities has the sixth and seventh grades, a time when students make the difficult transition from elementary to middle school. In the UK Lewisham College²⁶, working with Edge, has developed a practical learning curriculum which has ten elements (see Figure 4).

Figure 4 – Lewisham College’s 10 elements of practical learning

1. Join the world of work
2. Learn from experts
3. Learn by doing
4. Grow into the job
5. Learn and work in a team
6. Learn by solving problems
7. Recognise and make the grade
8. Prepare for the future
9. Know exactly what you’re learning and why
10. Do your very best.

It is interesting to see a serious attempt to create an applied version of some of the theory, one that is fit for use in a college, but even a brief analysis of these ten elements shows a very particular conception of practical intelligence and one which would be hard to measure. Practical learning, according to Edge, is learning:

- by doing things - not just thinking, talking, reading and writing about doing
- for real – the consequences matter
- from experts
- where clear links are made between practice, theory and judgement.

Like all good learning it fosters confidence, creativity and flexibility, and improves core skills such as teamwork, communication, organisation and the ability to learn.

Of course practical intelligence has its academic critics too. These tend to argue that the proponents of practical intelligence fail to show how it is distinct from academic intelligence or that it is a better predictor of success in life. But, in our view, Sternberg and others have, effectively demonstrated that you can be smart in many practical ways. It is not a question of academic or practical but rather a subtle blend of academic and practical approaches which are often required. Smart people know this.

The influence of context

In the 1930s Raymond Cattell²⁷ described intelligence as having three kinds of abilities. The first and most complex set of abilities he conceived as a general ability involved in almost all performances. The second involved certain group factors covering an area such as verbal, number, spatial or musical performance. And the third he thought of as being “certain abilities which are absolutely specific to one performance.”

In other words, context and situation matter. In some situations people perform well but when asked to do the same thing elsewhere they do not. Empirical studies of many kinds support this. You can be smart at arguing with your loved ones at home but go to pieces in front of your manager at work. You can be really quick at one kind of puzzle involving pictures but flounder when faced with a similar one using words. Sometimes it is smart to persist, while at other times it may be smarter to give up, go to bed and wake up ready to try a fresh approach on the following day.

The phrases increasingly used to explore the idea of context are “situated intelligence” and “embodied cognition”. Research in these areas go beyond the behaviourist views of the influence of environment to explore the unique ways in which smart human beings interact with their environment to maximise the opportunities it presents and overcome its limitations.

The starting point for this kind of thinking is a belief that focusing on an individual’s internal cognitive processes underplays or overlooks the environmental factors which need to be explored if one is trying to assess the degree to which behaviour is smart or not.

From this kind of analysis follows the belief that cognition cannot in any real sense exist in isolation from the world. It arises from and is linked to specific kinds of experiences and interactions.

In many workplaces, the idea of embodied cognition allows us to explain why it is difficult for some people to perform as smartly as they do in other environments. For if your cognition is embodied in a culture where, for example, creativity or individual thinking are not encouraged, then it is less likely that you will be able to be as smart as you are capable of being. Where a powerful group share an analytical cognitive style a climate in which “cognitive” decision-making is likely to be created. Such a climate is likely to facilitate routine problem solving, but the downside is that it will most likely impose limits on the options available and inhibit creativity.

Being smart in today’s rapidly changing world would particularly seem to involve the ability to perform in new contexts. This will involve being able to “read” the context to understand the opportunities and challenges within it. Sometimes it may involve consciously subverting the “rules” of the environment in which you find yourself.

Complex adaptive systems

Human minds are complex adaptive systems, as are their human hosts and as is the world in which we all operate.

The idea of complex adaptive systems is a relatively new one from which, we believe, there is much to be learned in terms of new kinds of smart. Complex adaptive systems seem to have a number of interesting characteristics:

- They evolve to fit the environment they find themselves in and at the same time influence their environment

- They emerge as a consequence of various simple rules being followed

- They do not have to be perfect to succeed

- The ease with which elements within a system connect with each other influences the success of the system, ensuring that feedback leads to improvement

- The more variety on a system the better; opportunities emerge from apparent or actual contradictions which emerge

- Small changes, if repeated often, can lead to significant changes

- Normal command and control hierarchies tend not to work as the system is constantly self-organising

- Most complex adaptive systems are part of other complex adaptive systems.

Thinking like this makes us realise the relativity and fluidity of intelligence. As with the idea of embodied cognition, it seems sensible to assume that smart people are constantly reading, responding to, and also changing the environment in which they find themselves. Dealing with feedback is also an important attribute along with the ability to live with ambiguity and complexity.

Individual or group

Why are groups of smart people often so dumb? Is it important to be able to perform well in a group in order to be smart? Chris Argyris²⁸ has shown how, in many group situations even smart people indulge in approaches which are too simplistic – “single loop thinking” - rather than using “double loop thinking” or what he calls “meta-learning”, both examples of more complex and systemic approaches. For too long being smart has been as something of a heroic or solo pursuit. We have not spent enough time investigating the social components of collaboration, probably because it is more difficult to measure and also to attribute to individual contributions.

The Talent Foundation²⁹ has already made a very modest contribution to thinking about this area of thinking in work it undertook on the dynamics of small teams in organisations.

Yet talk to most employers and they will characterise being smart as being able to contribute ideas to a team and work collaboratively for a common goal. From the early days of hunting in tribes, such skills must have had real value. In today’s world, effective participation in teams is essential, both at work and in domestic life. An ability to read different situations is called for. At one level this is not unlike Gardner’s interpersonal intelligence, already mentioned, and most recently given added impetus by Daniel Goleman’s approach to social intelligence³⁰. We are sure that, to be smart in any rounded sense of the word, calls for attributes, habits and skills of collaborative working that could never be picked up in any test of solo ability such as IQ.

But we think that we need to go much further than this. Jean Lave and Etienne Wenger³¹, with their idea of “communities of practice” have begun to show the complex ways in which knowledge can be shared, created, co-created and shared again. By this method, smart people tap into the smartness of other people either to accelerate their progress or to operate at a higher level than they could if thinking or acting in isolation. It seems likely to assume that smart people are good at “reading” other experts and learning what they need to learn from them. The current interest in coaching in the workplace is part of this general area of interest.

Fast or slow

Many intelligence tests operate against the clock. When we describe someone as “quick-witted” we are normally being complimentary. The phrase “slow learner” at school can all too easily be a gentler form of the medieval “dunce”. Watch any television test of smart – from *Mastermind* to *Who wants to be a millionaire* and being able to think fast is an important component. In similar vein society today values energetic, achieving, productive people, especially in the workplace.

Interestingly we know from the work of Mihali Csikszentmihalyi³² that having high levels of energy is one of the essential features of highly creative people. Might it also be so of very smart people? (If so, this would be drawing on thinking that has been around for more than a hundred years only a few years after his cousin, one Charles Darwin, had invented evolution, Sir Francis Galton suggested that energy or the capacity for work was one of two distinguishing features of those who were very intelligent³³.)

But, while it is fashionable to assume that speed is an indicator of intelligence, this is not always so. As Guy Claxton³⁴ and others have shown, it seems that there are different kinds and speeds of thought, and that sometimes, especially for the more intricate or ill-defined problems we face in everyday life, a slower mode of thinking works best.

We conclude that, while speed is important for some tasks, for others slow is smarter. In an increasingly busy world, slow contemplation seems to be increasingly important as a mode of being and thinking.

Some tentative answers

We started this chapter with some questions and we end it with some of our emerging conclusions. Each one is expressed as a statement on which we seek to build in the next chapter.

Being smart involves both general (g) and specific abilities. IQ, the most common test of g probably accounts for about 25% of performance in education and in the workplace. We intend to explore the other 75%.

Being smart would seem to involve many different elements. We are agnostic as to any specific theory of multiple intelligence but strongly support the notion that smart people will be likely to want to develop a broad range of intelligences. While general intelligence is important it is only a part of what it is to be smart.

We are confident that it is possible to get smarter, that intelligence is learnable.

While smart people tend to develop certain abilities we suspect that the cultivation of certain habits of mind is at least as important. Evidence seems to suggest that it is possible to reframe your mind set and so to function smarter.

Some of what it is to be smart exists as formal knowledge, but much of it – we are not sure exactly how much – is tacit know-how, often not easy to record in writing.

Smart people engage the full range of their senses. They see thinking and feeling as complementary ways of making sense of the world and exercising their intelligence.

We find the arguments for the existence of a practical component to being smart a compelling one.

Relatively little work has been done on the relationship between intelligence and context which we believe to be one of the most fruitful areas for further exploration, particularly the field of complex adaptive systems. This suggests to us that, in so many different ways, what is to be smart depends on the situation in which people find themselves.

For too long being smart has been seen as a heroic concept. We are increasingly excited by the notion of “team smart” and in understanding what it is that certain people have which makes them smarter than others when working in groups.

In a very adrenal world we would like to find out more about those concepts and contexts which seem to benefit from more reflective, slower contemplation. There is a richly meditative tradition to draw on here in understanding contemporary views of what it is to be smart.

3. Moving from theory to practice

Let's go back to our working definition of smart:

“Being smart is being able to successfully navigate whatever system or context you are in. It involves making the best of all available resources - your own and those of people around you - to maximise the opportunities and overcome the constraints of the environment you find yourself in.”

What have we learned from our study of some of the new kinds of smart we have been exploring? It seems to us that this first piece of research is just the first course of a much longer meal. The most fruitful areas of new thinking would seem to include:

- Complex adaptive systems - what it is to be one and be in one
- Non-conscious aspects of intelligence such as creative insight and intuition
- Social aspects such as groups, teams and communities
- Situated learning – both how it is possible to get better at learning from social experiences and how being smart is specific to context
- Embodied cognition
- The idea of practical intelligence
- Cognitive neuroscience, for example the ideas of plasticity and mirror neurons.

Exploring the other elements of being smart

With these areas of interest in mind we have begun to construct a framework for exploring what we have called “the other 75%”. The elements of this follow from our analysis of the new thinking which is currently emerging about what it is to be smart today. But this is a very wide field of focus and, in an attempt to narrow this down, we have selected a number of elements which fulfil the following eight criteria:

1. There is research evidence to support its validity
2. There is a centre or group dedicated to its study
3. It is simple and clear
4. It does not duplicate others
5. It is not a sub-set of another element
6. It is useable in other domains
7. There is evidence that you can become better at it, and
8. It is not included in the idea of general intelligence.

Learning how to learn and Applying knowledge

But before listing our candidates for further exploration, we need to be clear about our sense of what holds all of them together. We believe that there are two things: the capacity to learn how to learn, sometimes referred to as meta-learning and the ability to apply past knowledge, to be able to transfer things learned in one context to another.

While not always expressed in this language, the concept of learning to learn is present in most analyses of intelligence over at least a century. It seems to us to be the central unifying concept which ensures that an individual makes the best of all the resources available to them, at the same time maximising the opportunities and overcome the constraints of the environment they are in.

And knowledge transfer, is, in a sense, the “Holy Grail” we all seek. For, if we were all able, ready and willing to apply what we know to each new situation we encounter, then we would truly be demonstrating out intelligence.

These two elements, therefore, seem to assume a greater importance for us.

The elements

Sixteen additional elements are listed in Figure 5 on the opposite page. At this stage we are not worrying about whether they account for a small amount or large amount of the “remaining 75%”. We simply believe that there is some evidence as to their validity for further serious consideration and possible application. On page 26 we have attempted to group the elements in a way that will promote discussion and further debate.

We suspect that being smart involves knowing when to use any one specific element. In other words smart is not a commodity or, as in IQ, a score. It is an accomplishment that is very much rooted in the situation in which you find yourself. Each one of these elements, we believe, fulfils our eight criteria and is worthy of further investigation. For each one we list at least one proponent whose work provides the beginnings of a rationale for the element and which we would want to explore more as we move from theory into practice. There are many other proponents and centres of thinking about these elements and in our next report we will include a comprehensive digest of these.

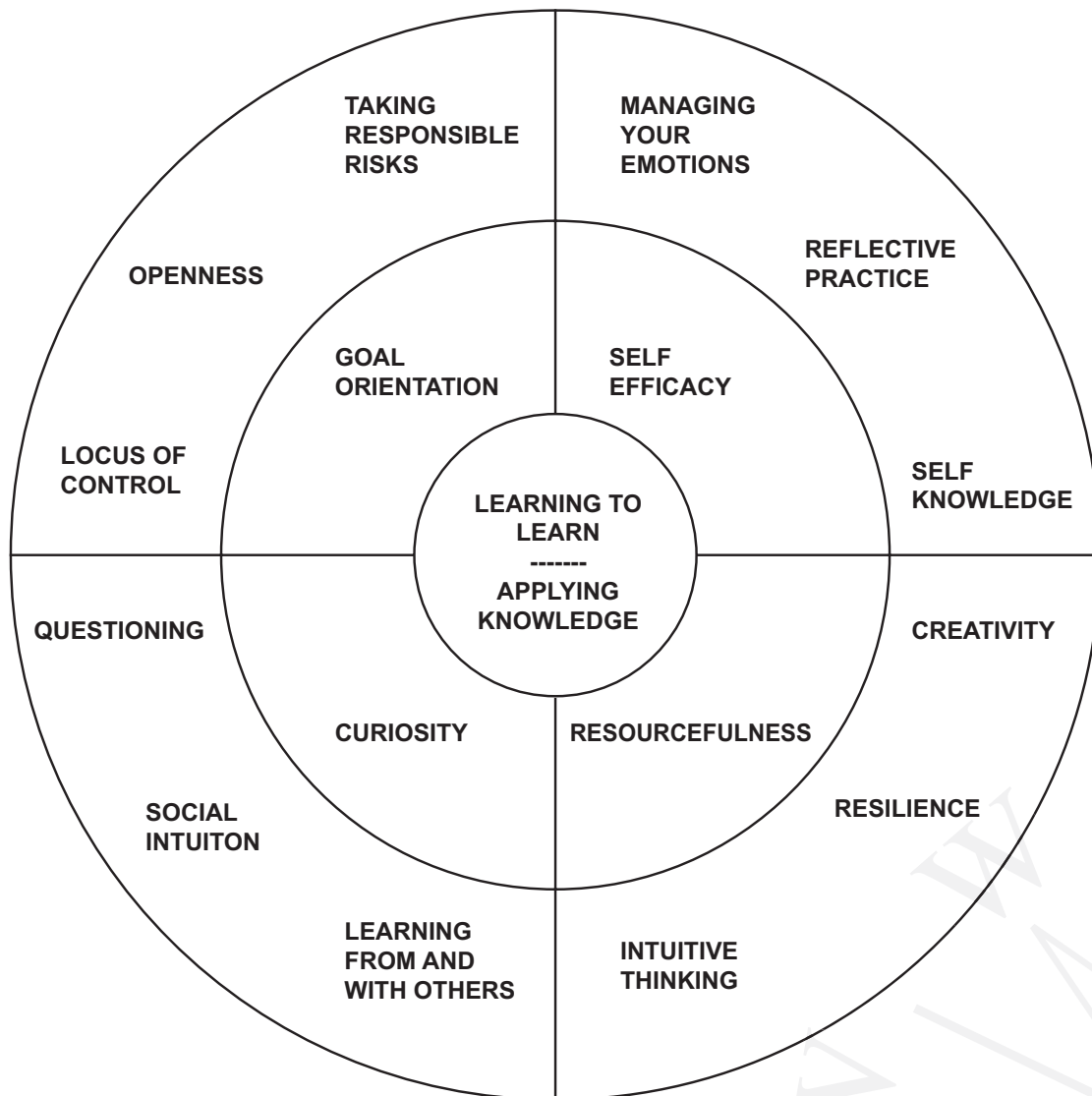
The elements have been tested in a workshop and through discussions and correspondence with individuals from different contexts. In the light of feedback from these processes we have refined the elements further, a process which we imagine will continue to go on for much time to come.

Figure 5 – Elements of smart

Element	Proponents
Intuitive thinking Knowing how and when to use your intuition	Robin Hogarth, Gary Klein, Bill Taggart, Guy Claxton
Social intuition The capacity to recognise other people’s emotions and respond accordingly	Robert Thorndike, Howard Gardner, Tim Wilson
Openness Being playful and consciously naïve	Ellen Langer
Learning from and with others Being able to understand and inter-act with different “communities of practice”	Jean Lave, Etienne Wenger, Albert Bandura, Chris Watkins
Reflective practice The systematic capacity to extract meaning from experience	David Kolb, Donald Schon, Chris Argyris
Taking responsible risks Knowing when taking risks is likely to be beneficial	Daniel Kahneman, Amos Tversky, Paul Slovic
Creativity Generating good ideas in different situations when you need them	Teresa Amabile, Robert Sternberg, Mihalyi Csikszentmihalyi
Self-knowledge Understanding yourself, playing to your own strengths and minimising your weaknesses	David Kolb, Martin Seligman
Self-efficacy The belief that you can do something	Albert Bandura
Locus of control Whether you ascribe chances of success or failure to internal or external factors	Julian Rotter
Goal-orientation The capacity to set and focus on goals	Edwin Locke, Gary Latham
Curiosity An appetite for learning	Daniel Berlyne
Managing your emotions The capacity to recognise and channel your emotions effectively	Jack Mayer, Peter Salovey, Daniel Golema
Resilience Persisting, even after shock or stress	Max Frost, Steve Rowley, Elizabeth Chell
Resourcefulness The ability to recognise possibilities and make the most of situations	Michael Rosenbaum,
Questioning Being able to ask relevant questions	Donald Schon, Chris Argyris, Peter Senge

To help us begin to see how these elements might connect, we offer, in Figure 6, this diagrammatic version.

Figure 6 – An overview of the elements of *New Kinds of Smart*



This diagram is by no means definitive. We are relatively confident that the two elements which sit in the middle of the “bull’s eye” exist at a higher “meta-level” than those in the middle ring. But we would want our tentative categorisation to be seen as just this!

In other words, while this “bull’s eye” diagram may be seen as implying a clear hierarchy, this is not our intention. We know that we will need to think more about how we illustrate our emerging thinking. The two inner elements seem more complex and in some ways more significant than all of the others. But the three elements in the outer ring, while clearly connected to their inner ring, also relate to the other three inner ring elements. Indeed we are particularly interested in exploring the connections between all sixteen elements in the next phase of our work. For example, it would be possible to see “Creativity” as assuming a higher importance than “Resourcefulness” or you might prefer to see “Resilience” in the middle ring instead of “Self efficacy”.

Simply by presenting a diagrammatic version of the elements we hope that we will encourage discussion about the relationships between the elements. We hope that by grouping clusters of elements together it will encourage new thinking about their relationships to each other.

Where next?

When we started exploring emerging thinking about what it is to be smart today, we naturally believed that we would come up with something so devastatingly more brilliant than IQ that the world would want it immediately.

Of course we rapidly recognised that such vaguely hubristic aspirations, while exciting us, were probably unrealistic!

Instead we believe at we we olry-vlieantra(pr)24.9(auch to)□TJ0-I.25 TD0542 Tw□(bhing mtar)-20.1(h to
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Appendix I

The Talent Foundation Manifesto *Changing the way we develop it in today's workplaces*

We believe:

1. People - their talents, their ideas and their performance - are critical to any organisation's success today.

This proposition has a new force today. For, whereas the UK working population grew significantly in the last 20 years, no growth is currently predicted for the next 20. Organisations will have to nurture and grow their talent rather than rely on hiring and firing to be successful.

2. There is an abundance rather than a scarcity of talent. Everyone, without exception, has talents to offer

There will always be a few skirmishes in some specialist areas, but the more general "war for talent" will cease to matter. At every stage of life we need to invest more on developing people and recognise that this requires managers actively to encourage people.

3. The ability to adapt, change and grow is an essential part of what it is to be talented.

Given that people develop and acquire new competences when they have experiences which challenge them, this approach should underpin the management of people in all organisations.

4. Learning how to learn is the key skill of the 21st century.

The UK fares badly on international comparisons of its skill levels, for example, in literacy and numeracy. We want to create a groundswell of interest in the process of learning itself.

5. The emphasis needs to move from training to learning.

We need new models of learning that understand the value of the informal. We want to see dynamic ways of creating opportunities for learning. These are likely to be briefer, more accessible and more respectful of individuals as lifelong learners.

6. The development of talent is a prime responsibility of all leaders and managers, not merely of the human resource department.

A fundamental re-think of the talent function is required that moves the debate beyond current HR approaches to become the paramount interest of leaders and managers. The term "human resource" is itself unhelpful.

About The Talent Foundation

The Talent Foundation is a not for profit organisation.

It seeks to create more opportunities for people to realise their potential at work.

The Talent Foundation creates new thinking, carries out practical research and develops tools which organisations and individuals can use.

The Talent Foundation believes that it is possible for individuals, organisations, and society as a whole, to take a very different view of talent. We are constantly seeking to find new ways of unlocking human potential and to create more hospitable conditions for talent to develop in today's workplaces.

The Talent Foundation acts as a bridge between the world of work and the world of research, helping these two communities to understand more about each other's needs and develop practical solutions together.

The Talent Foundation Research Trust, sister organisation to The Talent Foundation, is a registered charity which raises resources to fund small-scale research into the development of talent in the workplace.

www.talentfoundation.com

About Edge

Edge is an educational foundation. Its passion is to make practical and vocational learning a route to success for young people from 14 to 25 years-old. Practical learning is learning by doing things for real, working with experts and integrating theory and practice. It is a doorway to the working world.

Edge runs campaigns to change attitudes and behaviours. By engaging with students, employers, teachers, government and the media, Edge seeks to change the way practical and vocational learning is viewed and carried out.

Edge provides grants and funding, supporting organizations and initiatives that will deliver real changes.

Edge works to change policy - with opinion formers, educationalists and policy makers to identify the key barriers and opportunities for change.

www.edge.co.uk

