



# Neuro-Agility

Boost brainpower, learning agility and wellness

A New Paradigm for Talent Development &  
Performance Improvement

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# ERA OF DISRUPTIVE CHANGE

Big changes are coming. The world is entering an era of disruptive change. In a report: The Future of Jobs, the World Economic Forum (WEF) predicts an enormous change in the most desirable skills to thrive in the job market of the future. The list below illustrates the top 10 most desired skills for the workplace of the future in order of priority:

1. Complex problem solving
2. Critical thinking
3. Creativity
4. People Management
5. Co-ordinating with others
6. Emotional intelligence
7. Judgement and decision making
8. Service orientation
9. Negotiation
10. Cognitive flexibility

Five of the top ten skills can be categorised as “brain power” skills and five fall into the framework of emotional intelligence (EI) skills. With regards to brain power skills, complex problem-solving occupies the top slot, critical thinking skills and creativity takes the second and third position, judgement and decision making in seventh position and cognitive flexibility coming in at number ten.

## THE CHALLENGE OF DISRUPTIVE CHANGE

### Lack of skills to cope with information overload

Rapidly changing technologies coupled with data explosion and the generally heightened pace of change will cause disruption on every level of society and in every industry. Information is now more than doubling every year. Today the brain of the average worker must process 30 times more information than 20 years ago. A single weekly edition of the New York Times contains more information than a person would have been exposed to in a lifetime during the 17th century! On the downside of this amazing expansion of available information, is the real threat of being overwhelmed by the sheer volume. An estimated 75 to 90 percent of all illnesses have its origin in chronic stress. Information overload is quickly becoming one of the greatest sources of stress. People are constantly feeling overwhelmed by too much data, often thinking they don't have sufficient brain power skills to process information effectively and cope with processing volumes of information.

Not only are people reading less and slower, they only retain full concentration for 20 minutes at a time. People forget up to 90% of what they learn within one week. The reality is that people are relying on devices like calculators to do their calculations, GPS devices to take them where they want to go and devices to help them remember, but are not relying on their brain's natural ability to think, learn, remember and calculate for itself? That is actually their competitive advantage.

The argument is not that people should not use devices and technology, as they are powerful tools to accelerate what we do. We should however, not stop using and optimising the brain's ability to flex mental muscle if we want to stay in control of technology and artificial intelligence. What distinguishes man's competitive advantage from artificial intelligence is specifically the fact that our brain has the potential to naturally perform cognitive processes like making predictions and forecasts about future situations, creating new solutions, performing counterfactual thinking (the ability to imagine what can be and identify alternative outcomes), recognising patterns, experiment and reflect, learn, create and solve problems in sophisticated ways like nothing else in the universe. Having the potential to out-think, out-learn and out-create is unfortunately not enough. Potential plus nothing equals nothing. Potential plus appropriate skills equals competence. Therefore, developing the brain power and emotional intelligence (EI) skills as the WEF suggest, will be essential to our progress and survival.

On average readers read around 200 words per minute with a comprehension of 60%. It is even less in developing countries. While the world is exploding with information, the contradiction is that only one in 10 books that are bought, are read. In a time where we now need to read faster than ever before, we are reading less and slower. Most adults and children don't read any more. Often, managers are complaining about staff that are not reading their emails. Reading and learning problems are at an all-time high. Learning service providers must adapt their courses to video learning solutions as people and especially younger generations now prefer learning through videos rather than script.

To cope with the current reality of information expansion, readers should be reading at speeds above 1000 words per minute with 85% comprehension. These readers only comprise 1 % of the first world population. To do this, requires the whole brain to function at optimum level, being ready to receive and transmit sensory stimuli and open and responsive to ideas, impressions, and concepts, all at the same time. It will also require advanced visual processing skills, the ability to reduce masses of information to meaningful data, concentration skills and memory skills. Lack of these learning skills, will make people less attractive as job applicants and may prevent billions of people to be employable and competitive, losing their jobs to robots and artificial intelligence.

People are not born with skills. They develop them. Fact is that few learning institutions like schools, colleges and universities provide the necessary skills that will ensure their learners are sufficiently equipped with relevant "brain power" and "EI" skills to not only survive, but to thrive in the job market of the future.

## Technological advancements

Big technological changes are on our doorstep. The interplay between fields like artificial intelligence, virtual reality, the internet of things, 3D printing, neuroscience, mobile networks, and computing will create realities that were previously unthinkable. Radical system-wide innovations can happen in short periods of time. Machines can learn, which puts artificial intelligence in direct competition with people, especially those who are doing routine and repetitive jobs. It will cause widespread disruption to business models and labour markets over coming years.

People who do not have advanced cognitive skill sets as suggested in the WEF's top 10 most desired skills for the workplace, and specialised technical skills, doing basic repetitive or computer work, will be replaced by robots that will take over their jobs. Some sources predict as many as 60-70% of people stand to lose their jobs within the next 10 years.

## Human error

One of the greatest risks to the success of businesses is human error. Human errors can be the root cause of both catastrophic organisational accidents and serious individual injuries. Incident reports in some industries show that as much as 80% - 90% of serious injuries and accidents have been attributed to human error. The overall cost of human error to US and UK businesses is \$ 18.7 billion per year. To reduce human error, businesses are spending billions on artificial intelligence and technology that can help them reduce the risk for injuries and accidents, saving lives and improving productivity and profits, but often replacing people and taking their jobs.

The fact of the matter is that if the world of business wants to reduce their risk for human errors, they should primarily focus on helping humans reduce their risk for error before considering technology as the primary solution. Unfortunately, little is done in general to help an individual reduce their risk for error, suggestion that we do not have sufficient knowledge to know how to go about helping individuals reduce their risk for errors.

## Workplace engagement

Employee engagement is a workplace approach resulting in the right conditions for all members of an organisation to perform at their best each day. Engaged workers are committed to their organisation's vision and mission, motivated to contribute to organisational success, with an enhanced sense of well-being. Employee engagement is vital for a company's productivity, success, and progress.

Disengagement equates for 51% of the US workforce. Actively disengaged employees are costing the US \$450-550 billion in lost productivity. Organisations with engaged employees out-perform those with low employee engagement by 202%.

One of the primary reasons why people are disengaged in their jobs is the lack of alignment between who they are (their neurological design) and what they do (career and job functions). People's neurological design also has numerous implications for relationships, team roles, stress and fatigue management, whole brain communication, emotional intelligence, and how they learn and think.

# NEUROSCIENCE

## 1. Learning

The only way that people and business will maintain a competitive advantage in this rapidly changing, information soaked, and turbulent world, is to be able to out-think, out-learn and out-create any competition. By gaining deep insight into how the brain functions in support of learning, critical thinking, creativity, and problem-solving, neuroplasticity and decision making, we can better prepare people to adapt to, and prepare for a continually changing market place, thus allowing companies to maintain a competitive advantage in highly turbulent business environments.

Brain power is our competitive advantage. Ultimately the brain's main purpose is to let people survive. On a physical level, it is about regulating bodily functions. On a mental level, it is about a person's ability to adapt to our world. Man's learning ability to adapt, adjust, learn new information quickly and unlearn old behavior faster than their competition, will be crucial to our survival and progress in an era of disruptive change.

Progressive companies realize that if they want to prosper, they must become and stay learning organisations who build learning into their organisation's strategy, provide learning as a core competency, and remain committed to establishing and maintaining a culture of learning. Future learning organizations will be enterprises whose workforce has the learning agility to continuously adapt and adjust in diverse and continuously changing circumstances faster than their competitors, to new systems, technology, and strategies fast. Their workers' ability to learn will comprise of a diverse set of attributes and competencies that include, but is not limited to attributes such as openness to experiences, motivation to learn, recognition of new opportunities, recognition of new skills needed when change occurs, and resilience in the face of adversity.

Successful global companies like Toyota know that their workforces' ability to learn is requisite to survival and progress in a highly competitive market. Toyota understands that its workforces' ability to learn consist of a constellation of attributes and skills that enable them to develop and refine job related knowledge and skills in response to changing job demands, continuously improving performance and adapting to change. Subsequently, they have adopted a philosophy called "Kaizen" (which means ongoing learning and improvement) to invest in reskilling, upskilling and multiskilling by continuously rotating the jobs people do, to change behaviour conducive to out-performing their competition.

Some Fortune 100 companies are already using a person's learning agility – the willingness and ability to learn from experience and learn new competencies quickly, in order to improve future performance – as one of their primary criteria in talent selection to employ new recruits. The speed with which people learn and the flexibility they exhibit in learning, both within and across situations, has become a major criteria to identify future high-potential talent.

## 2. Neuroscience

Neuroscience, also referred to as neurobiology, is a multidisciplinary branch of biology that deals with the structure, development, function, chemistry, pharmacology, and pathology of neurons and neural circuits of the brain and nervous system. As an interdisciplinary science, it is one of the major accelerating forces of change across industries like medicine, business, psychology, philosophy, linguistics, chemistry, economics, education, and engineering.

The 5 brain power skills suggested by the WEF as the most desired skills for the workplace clearly illustrates the importance and value of neuroscience. If skills like complex problem solving, critical thinking and creativity is not grounded into neuroscience, the learning practices to develop these skills may not be sufficiently validated and accurate.

Neuroscience is not only concerned with the normal functioning of the brain for medical and healing purposes, but also with people's behavioural and developmental purposes. Neuroscientists focus on the brain and its impact on behaviour and cognitive functions across all disciplines.

## 3. Neuroscience of Learning

Cognitive neuroscience is a major branch of modern neuroscience – the study of higher cognitive functions that exist in humans, and their underlying neural bases. It draws from neuroscience, cognitive science, psychology, education and the science of learning.

Recent advances in neuroscience research has significantly enhanced our understanding of brain processes, and the function of its underlying neural systems (how the brain stores and processes information, how neural plasticity impacts learning and observable behaviour, etc.). This has led to stronger understanding of biological processes involved in learning, the relationship between brain hemisphere and sensory dominance, the impact on cognitive control, dynamics of learning agility, personal motivation, and social and emotional learning.

Until now, the science of learning principally was rooted in education and psychology. While these areas of research have greatly advanced our understanding of how knowledge is transferred, new skills are developed, and behaviour is changed to adapt in dynamic environments, the methods employed in behavioural sciences such as these have relied extensively on hypothetical constructs and have been able to measure relevant variables only indirectly.

Scientific research focusing specifically on the brain, such as physiology, neuro-physiology, chemistry, psychoneuroimmunology, and anatomy, provide methodology that support more direct observations of relevant variables, which serves to validate findings from the behavioural sciences. This reciprocal and synergistic relationship between the sciences provides the promise of making tremendous gains in our understanding of how humans learn and will continue to provide direction in leveraging the reciprocal relationship between brain and environment.

The neuroscience of learning is a branch of cognitive neuroscience. It is concerned with anchoring the science of learning into neuroscience. It provides sufficient evidence that can be put into practice to validate learning as one of the essential ingredients, if not the most sustainable ingredient for improving the performance of the workforce, improving productivity, impacting company bottom line and ensuring survival and progress of a company.

This places the neuroscience of learning in the centre of any talent management and performance improvement initiative, where identifying potential, selecting talent, or modifying, optimising and developing people's ability to learn, and reducing risk for error is a focal point.

The neuroscience of learning is revealing new insights about the neurophysiological mechanisms that influence talent and personality, offering new ways to approach talent selection, talent development, performance improvement and the reduction of human errors. For example, we are learning that factors like fatigue and stress may cause neurological hindrances that may significantly impact an individual's propensity for human error.

## Why neuroscience of learning matters

- It validates learning and the behavioural sciences as it is grounded in hard sciences such as physiology, chemistry etc.
- It is inclusive of all cultures, races, genders, and generations and therefore requisite to any global people development and performance improvement initiative;
- It complements behavioural sciences and integrates easily with different learning technologies;
- It offers fresh perspectives on developing people's ability to learn;
- It offers a higher return on investment in talent development and performance improvement initiatives when grounded in hard sciences;
- It separates facts from fiction, thereby solidifying learning practice.

## Neuroscience of learning fundamentals

There are certain fundamental premises of the neuroscience of learning that are essential for learning professionals and practitioners to understand its applications to organisational learning. Any person responsible to prepare children, students, and workers for developing the skills necessary to prosper in the new landscape predicted for the future, will be well-served to have a clearer understanding of issues such as:

- The bio-chemistry of learning and thinking;
- How the brain works and processes information;
- Mechanisms that influence brain functions and learning;
- Learning implications of different brain regions;
- The concept of brain fitness and how to nurture and improve it;
- How to prepare and activate the brain for learning, thinking and creativity;
- How to identify and improve drivers that optimize brain performance;
- Advanced visual skills for workers who processes volumes of information;

- How to develop complex problem solving, critical thinking, creativity, emotional intelligence, and memory skills for 21st century workers;
- How neuroplasticity and learning agility is at the core of developing learning ability and behaviour change;
- The concept of neurological dominance, it's relationship between brain hemisphere and sensory dominance and its impact on performance and safety;
- How to determine people's unique neurological design (neuro-design) and learning potential;
- How people's neuro-design impact their propensity for error, sense of purpose, engagement, and performance;
- Aligning workplace practices with memory and attention spans;
- Aligning working and learning environments with brain ergonomics principles.
- How to accommodate social and emotional learning preferences in the workplace;
- Grounding talent development and performance improvement practices into neuroscience;

Incorporating these fundamental principles and applying this evidence-based knowledge into their practices of human capital development, would be highly beneficial for people development and performance improvement practitioners, lecturers and teachers, as studies prove it produces better performance results, return on investment, sustainable behaviour change, wellness, productivity, and safety.

### 3.1 Neuroscience of Talent Development

Talent is the natural ability that people are born with to excel at doing something that is hard or challenging. It is about the natural abilities that stand out in people and make them unique. All people are gifted, but in different ways. Some have more talent than others, but everybody has talent.

The neuroscience of talent development is a crucial component of the neuroscience of learning. People learn in different ways and are talented differently, based on their neurological design. Neuroscience research has significantly enhanced our understanding of brain processes and mechanisms that impact neurophysiological aspects of personality and how people are talented.

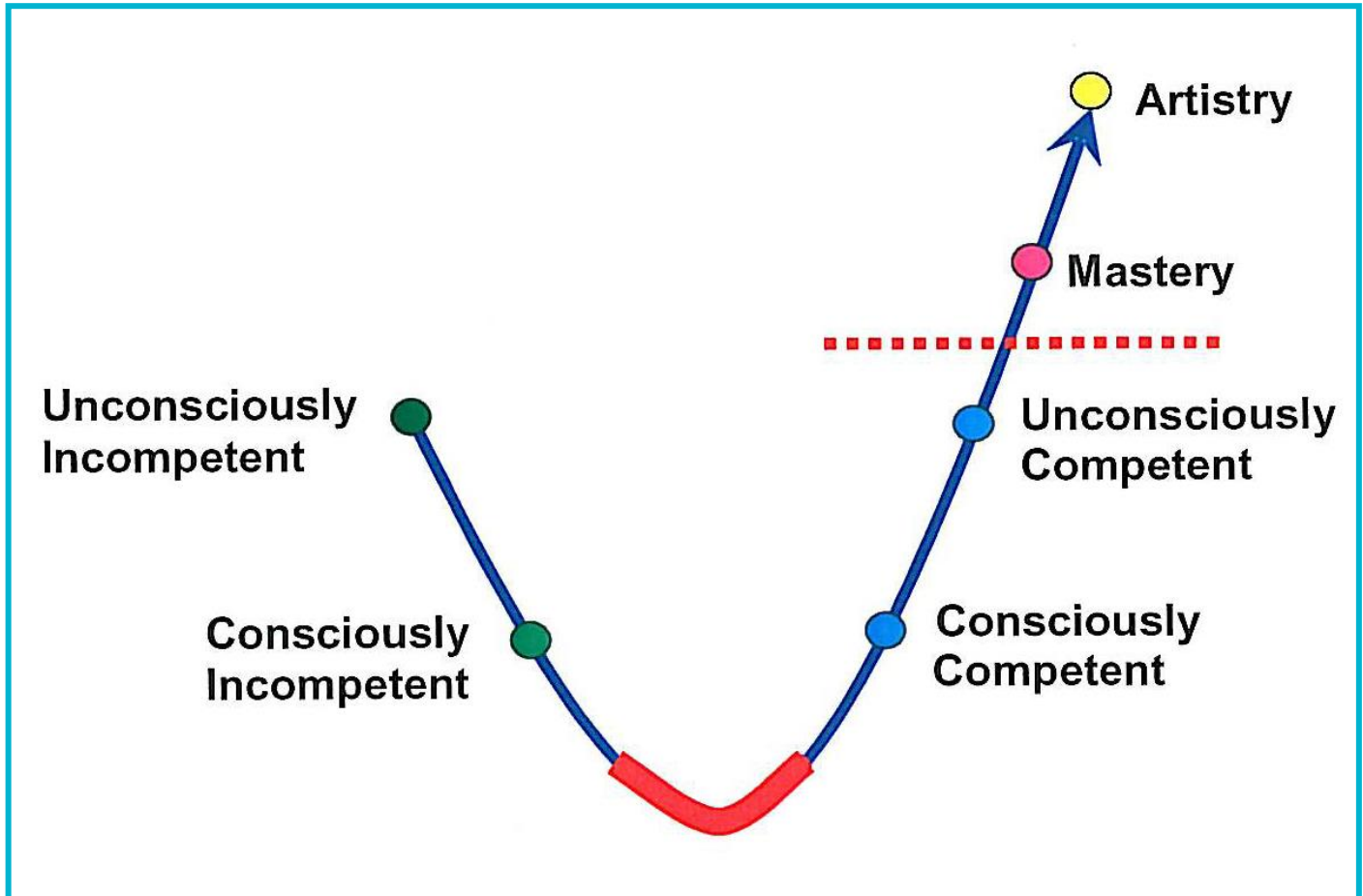
People's neurological design is about how their naturally strengthened neural networks influence their predisposition towards which brain regions, senses and intelligences will dominate (lead) during learning, thinking and cognitive processes. These strengthened neural networks will cause people to be consistent in their brain, sensory and intelligence preferences, establishing a specific blueprint for how they would prefer to think, learn and process information differently.

We believe that talent is the sum-total of nature and nurture, or differently stated, neurological design (potential) plus alignment and reinforcement of appropriate skills. Understanding how people are wired, is the first indication of their unique potential and how they are talented. It should not only be part of any talent identification, selection and talent development initiative, but actually be the point of departure.



## Talent development journey

The journey towards mastery and artistry of talent can be illustrated as follows:



### Unconsciously incompetent

People are born with potential, but not with skills. Potential without skills stay potential. It is only an indication of what can be, but not of what is. A person can have exceptional linguistic potential to be a great speaker, but without learning the appropriate skills to present and speak and then practice those skills for a long time, the person will not become the speaker he or she potentially could be. This is the tragedy of many – the fact that they have never truly discovered what it is they have potential for. They are unaware of their potential and therefore unconsciously incompetent. Workers for whom this is the truth, will normally be disengaged workers – part of the 51% disengaged workers previously mentioned. People cannot be what they don't know.

**Unaware of potential.**

### Consciously incompetent

Some people are aware of their potential, but have not developed appropriate skills aligned with their potential, which makes them consciously incompetent with regards to how they are talented.

**Potential + no appropriate skills = potential**

### Consciously competent (good)

Others have learned skills, but never discovered their true potential or have not developed skills that are aligned with their true potential and therefore are not the best they can be. They are consciously competent or even well skilled and good at what they do, but will not be passionate about what they do, because of the miss-alignment between their potential (neuro-design) and skills. If they are good at what they do, it is because they have practiced and reinforced their skills well. More often than not, they are workers who produce a minimum performance to stay employed, but are not high potentials or high performers. Many people become stuck at this level of their talent development journey.

**Potential + average reinforced skills = average competence**

### Unconsciously competent (great)

Talented and gifted people have merged their potential and skills and reinforced it exceptionally well, exhibiting high performance capability in a specific field until it becomes second nature. They have moved past the level of being consciously competent to a level of being unconsciously competent. They exhibit high performance capability, but are not always aware why they are great at what they do. Producing consistent outstanding performance, for them, has become an automatic response. These individuals are “high potentials” who have aligned who they are with what they do, therefore engaging well in the workplace.

**Potential (neuro-design) + very well reinforced appropriate skills = Talented / Giftedness**

### Mastery and artistry (excellence)

Continuously sharpening the saw, by modifying, optimizing, reinforcing and strengthening their talent over a long period, will lead people to reach levels of mastery, being experts at what they do. The journey to mastery and eventually artistry of a person's talent, cannot have a more fundamental starting point than taking into consideration the neurophysiological aspects that influence a person's talent and personality.

Talent cannot effectively be improved if it cannot be measured. Assessing talent starts with assessing a person's neuro-design, that will be an indication of the person's potential and how that person is talented.

As an example, we now know that alignment between how people are naturally talented and the job functions they perform is crucial to be highly engaged and productive. Professionals responsible for selecting the right talent for the right position should not only take qualifications and experience into consideration, but even more so, what the candidate is naturally talented for, risk for error and learning agility – gaps that have not sufficiently been addressed previously.

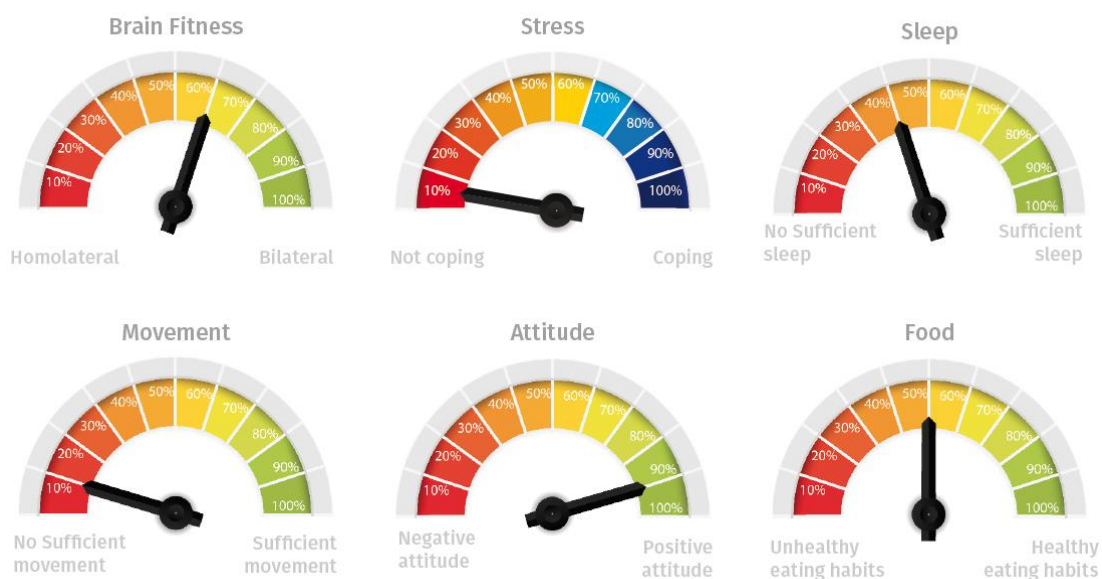
With technological advancements, the world has become a small place and the workplace will increasingly consist of people from different nationalities. This means that all organisations are forced to become more inclusive in their approach to people development. It leaves them with no alternative but to have a global perspective on developing talent. There can be no better approach than following a neuroscience approach to talent development, as a brain has no culture, race or gender.

Any practitioner responsible for selecting and developing the talent of others should anchor their assessments and development initiatives into neuroscience, as it is an approach that are inclusive of all people. Therefore, having a neuroscience approach to talent development is not optional anymore, but mandatory.

## 3.2 Neuroscience of Performance Improvement

Performance improvement cannot start at any other place than getting the most out of your brain. To following analogy explains the impact of overall brain fitness. One horse pulls between two to three tons of weight, but two horses pulls between six to eight tons of weight. There is a multiplication effect when the two horses pull together. Similarly, there is a multiplication effect when the two hemispheres and all neural systems and brain regions start synergising, creating optimised brain performance.

To ensure a person taps into all their cognitive resources to achieve top performance, they have to leverage all the drivers that impact their brain's performance. There is a compelling body of evidence that ties improved performance to drivers like brain fitness, stress coping skills, sleep, movement and exercise, optimistic mindset and nutrition. These drivers can significantly improve our brain health, memory, focus, cognition and energy, thereby impacting productivity, engagement, learning agility, well-being and overall brain fitness.



From a talent development perspective, performance improvement starts with measuring a person's neurological design. That will be an indication of that person's unique potential. Subsequently, potential will be changed into performance by aligning potential with appropriate skill sets and then modifying, optimising and sufficiently practicing and reinforcing these skill sets until a satisfactory level of performance is achieved.

The neuroscience of performance improvement is intricately interwoven with the neuroscience of talent development. The interplay between the drivers that optimise brain performance and a person's neuro-design will determine how fast or slow they learn, how they process information, their level of risk for error, how effective they are and how efficiently they perform.

Having a global approach to performance improvement that is inclusive of culture, gender, and race, is not optional any more, but mandatory. The drivers that optimise brain performance is beneficial to all people, regardless of race, culture, gender or even the level of education for that matter. Therefore, following a neuroscience approach to performance improvement is a prerequisite to any person who is responsible for developing themselves or others.

### 3.3 The Concept of Neuro-agility and Measurement

Neuro agility is about the readiness of all the senses and brain regions to function as one integrated whole brain system, being receptive and responsive to receive and transmit bio-chemical impulses at optimum capacity under new and potentially stressful conditions. People who are highly neuro agile have the flexibility to learn new skills, attitudes and behaviours fast and easy and unlearn old behaviour patterns quickly.

It requires the whole brain to be ready to receive sensory stimuli and transmit bio-chemical impulses to all brain regions, establish new neural networks, retain, express, and apply information, change behaviour and perform according to potential. Neuro agility underpins the brain's ability to be in-flow, learning fast and effectively, committing as little human error as possible. It requires being able to concentrate while engaging the whole brain effortlessly during cognitive processes like learning and thinking.



Dr. André Vermeulen, business innovator and neuroscientist, has been working in the field of talent development and performance optimisation for more than 30 years, and has developed a way of measuring Neuro-agility for the first time. An international workplace learning specialist, using applied neuroscience to develop learning solutions, his leading-edge Neuro-link neuroscience assessments measure 6 factors of Neuro-agility.

His research on different talent development and performance improvement needs in a global market place that should be inclusive of culture, gender, and race, led him to formulate a new paradigm for talent development and performance improvement called neuro agility. It is a universal need, relevant to all people who need to learn, think, and process information easy and fast and be flexible to the challenges of constant disruptive change.

The construct of neuro agility is situated within the broader domain of learning. Neuro agility is a component of the “ability to learn”. It focuses on the neurological components of learning, thinking and cognitive processes. Furthermore, it also provides fresh insights into how people learn and why some learn faster, easier and are more flexible than others – shedding light on issues that have not been addressed before.

Dr. Vermeulen has developed a conceptual framework for the construct of neuro agility that includes drivers that optimise the brain's performance and neurophysiological attributes that influence a person's neurological design. The interplay between people's neurological design and the drivers that optimise their brain performance, significantly influences the ease, speed, and flexibility with which people learn and their propensity for error. This multi-dimensional, neuroscience approach, compliments and strengthens constructs like “ability to learn” and learning agility, but is neither exhaustive nor exclusive to any of these concepts.