A DOSE OF ALL THINGS ENTERPRISE, LEADERSHIP AND GOVERNANCE.

Creators of the Modern World: Nikola Tesla

Nikola Tesla was a Serbian American engineer (1856-1943) notable for his inventions and breakthroughs in science. Tesla made important discoveries in the production, transmission and application of electric power. He gave us the first alternating current (AC) and developed its transmission and generation technology. Tesla also invented radio, robots, and the remote control. His electric induction motors run our appliances and factories, designing plans for cell phones, the Internet, death-ray weapons, and interstellar communication. His ideas have lived on to shape the modern economy, yet he has been largely overlooked by history.

Born in Croatia to an Orthodox Priest and a mother that managed the family's farm.His interest in electrical invention was spurred by his mother, Djuka Mandic, who invented small household appliances in her spare time. Studying maths and psychics at the University of Graz and Philosophy at the University of Prague, Tesla came up with the idea of a brush-less AC motor through sketches, later moving to France where he worked, repairing direct current power plants.

In 1884, Tesla arrived in America, with little more than the clothes on his back and a letter of introduction to famed inventor and business mogul Thomas Edison, whose DC-based electrical works were fast becoming the standard in the country. Working together, they made improvements to Edison's engineering. However, conflict arose between the two parties. Their differences in approach towards business seemed to be irreconcilable. By 1885, Tesla received funding for the Tesla Electric Light Company and was tasked by his investors to develop improved arc lighting. However, after successfully doing so, Tesla was forced out of the venture and for a time had to work as a manual labourer in order to survive.

Poor and reclusive, Tesla died of coronary thrombosis on January 7, 1943, at the age of 86 in New York City, where he had lived for nearly 60 years. However, the legacy of the work Tesla left behind him lives on to this day.

The Learning Edition

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*With many students are heading back to school this week, we focused this edition of the newsletter on **Learning.***

*Learning is a lifelong process which if we engage in specifically for a goal will yield results that **improve performance** and ultimately change.*

*There are various schools of thought on **effective learning and teaching styles** which move away from traditional classroom based methods however **self-learning** is equally a highly invaluable skill that anyone can engage in regardless of age and stage in life.*

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The Science of Self-Learning

In an ever-evolving world, the ability to learn independently has become an invaluable skill. Self-learning, also known as auto-didacticism, is the process of acquiring knowledge and skills without formal instruction or guidance. It is a testament to the human brain's remarkable capacity for adaptation and growth. This article delves into the science behind self-learning, exploring the cognitive mechanisms that underpin this phenomenon and highlighting effective strategies for successful self-directed learning.

Cognitive Mechanisms of Self-Learning:

Neuroplasticity: At the heart of self-learning lies neuroplasticity, the brain's ability to reorganize itself by forming new neural connections. As individuals engage in self-directed learning, they expose their brains to novel information, leading to the formation of new synapses and strengthening existing ones. This process is facilitated by the brain's ability to adapt its structure and function in response to environmental demands. Neuroplasticity ensures that learning is not confined to specific periods of life but continues across the lifespan (Draganski & May, 2008).

Active Engagement: Self-learners tend to be actively engaged in the learning process. This engagement involves setting clear goals, seeking out relevant resources, and critically analyzing information. Studies have shown that active participation enhances memory consolidation and the transfer of knowledge from short-term to long-term memory (Dunlosky et al., 2013). This proactive involvement deepens understanding and fosters a sense of ownership over the learning journey.

Metacognition: Metacognition refers to the ability to monitor and regulate one's own cognitive processes. Self-learners often exhibit heightened metacognitive awareness, allowing them to assess their understanding of a topic, identify knowledge gaps, and adjust their learning strategies accordingly. Metacognition plays a pivotal role in effective self-directed learning. Research by Schraw and Dennison (1994) highlights the importance of metacognitive strategies in enhancing learning outcomes.

The Science of Self-Learning (..continued)

Strategies for Successful Self-Directed Learning:

1. Goal Setting: Setting clear and achievable goals is a foundational strategy in self-learning. Goals provide direction and motivation, guiding learners in their pursuit of knowledge. Research by Locke and Latham (2002) highlights the positive impact of goal setting on performance and persistence.

2. Resource Selection: Effective self-learners possess the ability to identify high-quality resources. The internet offers a vast array of information, making discernment crucial. The CRAP Test (Currency, Reliability, Authority, Purpose) is a tool that helps learners evaluate the credibility of online sources (University of California, Chico).

3. Active Recall and Spaced Repetition: Active recall, the practice of actively retrieving information from memory, is a potent learning technique (Karpicke & Roediger, 2008). Combined with spaced repetition, where information is revisited at increasing intervals, this approach enhances long-term retention.

4. Interleaved Learning: Instead of focusing on a single topic for an extended period, interleaved learning involves alternating between different subjects. This technique has been shown to enhance learners' ability to discriminate between concepts and apply them effectively (Rohrer & Taylor, 2007).

The science of self-learning underscores the brain's adaptability and the potential for individuals to acquire knowledge and skills independently. Neuroplasticity, active engagement, and metacognition form the core cognitive mechanisms behind this process. By employing strategies such as goal setting, resource selection, active recall, spaced repetition, and interleaved learning, self-learners can optimize their efforts and achieve meaningful outcomes. Embracing self-directed learning not only empowers individuals to keep up with a rapidly changing world but also nurtures a sense of autonomy and intellectual curiosity.

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SOCIAL CONSTRUCTIVISM

The concept 'social constructivism' is the idea that learning is best achieved through social interactions and by helping others. It points out to society that a person's understanding is dependent on its ability to be shaped through social interactions. From 1896-1934, it was people like Lev Vygotsky, a Soviet Psychologist, that formed this concept; the foundations of his theory underlines to us that knowledge in fact is not 'a copy of an objective reality' but is the result of the interactions between subjective and environmental factors. In other words, if a person cannot go through certain experiences, they cannot truly learn and gain knowledge, therefore life needs all the experiences it can get.

Vygotsky describes the processing of new knowledge using three key terms: construction - building understanding of a new concept through gathering different pieces of knowledge; storage - this is a mental process of storing new information into your memory, and lastly retrieving - this includes searching out memory that already exists.

It may appear simple to gather information 'local' to you however it gives room for errors to occur. For example, reconstruction errors arise when a person does not have full understanding. This means that whatever situation they found themselves in, they did not allow their mind to comprehend a new construct out of it. Instead, during that process thoughts are stored that seem logical but are really, incorrect.

Personal vs Social

Though it appears that individuals in society are socially constructed, people also like to construct knowledge through their personal experiences whilst social constructivism speaks of the social interactions that affect the learners' construction of knowledge. Sociologists like C.W.Mills reveal to us theories such as the 'Sociological Imagination' where he tries to make society believe that issues or experiences are 'society' based rather than created for an 'individual', meaning that there should be clearer decisions made for each issue as they are not as personal as they seem. He quotes "neither the life of an individual nor the history of a society can be understood without understanding both." This concept helps to justify why social constructivism may be more profitable to society in comparison to individual constructivism giving room for personal understanding and decisions, though, it is not totally wrong.

Social constructivism places great emphasis on learning being an active and social process. Supporting this theory is the "Zone of proximal development". This is the idea of the distance between someone's personal problem-solving ability and their problem-solving ability displayed when given guidance from more knowledgeable adults. For example, mentorship. It speaks of the skills or knowledge that a learner is close to acquiring.

Although social constructivism can appear to make individuals be uniformed in their response to life, it carries many benefits such as, exposure to different views when interacting with others, the ability to identify errors and inconsistencies within their own thinking patterns, improve metacognitive skills and reach higher levels of creativity.
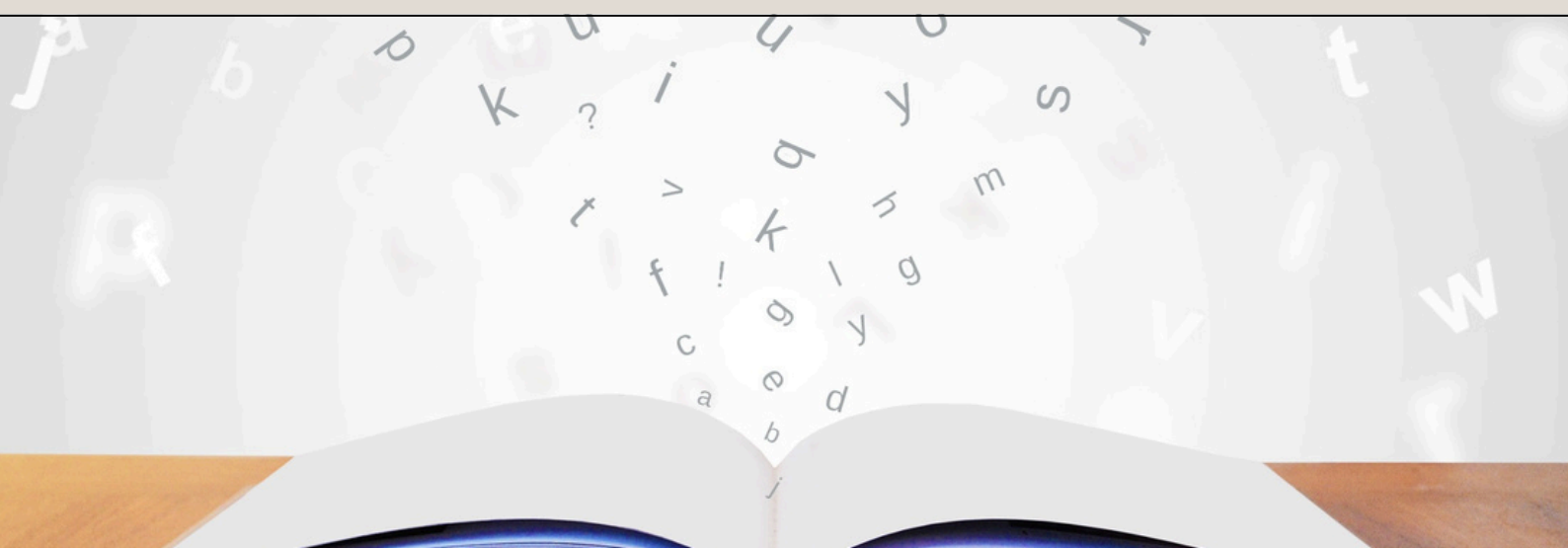
THE THEORY OF MULTIPLE INTELLIGENCES

Howard Gardner first proposed the theory of multiple intelligences in his 1983 book "Frames of Mind", where he defines intelligence as a "biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (Gardner, 2000, p.28). Essentially, Gardner claims that people are not born with all of the intelligence they will ever have. His theory challenged the conventional concept that there is one single type of intelligence, occasionally known as "g" for general intelligence, that only centered on cognitive abilities. Gardner proposes there are nine specific types of intelligence which are:

1. **Verbal-linguistic intelligence:** Being able to pick up new languages and comprehend how to utilise language strategically. An example of this is analysing data and preparing a speech to preset in front of a group.
2. **Logical-mathematical intelligence:** Being able to analyze problems logically and solve abstract problems from mathematical concepts to solving a real-life mortgage scenario.
3. **Spatial-visual intelligence:** Being able to use visual aids and spatial judgement to arrive at a solution. An example of this would be using a tool like Photoshop to design a new logo for a fictional client.
4. **Bodily-kinesthetic intelligence:** Using the entire body skillfully to address a challenge such as performing CPR on a mannequin.
5. **Musical intelligence:** Being able to create and scrutinize pitch, rhythm, sound and music. This includes asking students to create and edit a podcast episode or write a song showcasing their learnings from a course.
6. **Interpersonal intelligence:** Being able to identify and inspect intentions, moods and desires to understand and relate to others. This includes preparing a sales pitch with product discovery questions for an obstinate client.
7. **Intrapersonal intelligence**: Being able to fully understand oneself and to effectively regulate one's own life and emotions. Essentially, introspection and self-reflection. An example would be asking students to reflect on what their career goals are and what steps they are taking to meet their goals.
8. **Naturalist intelligence:** Identify and classify various plants by finding patterns and relationships to nature. Such as asking students to label five different plants using their scientific names.
9. **Existential intelligence:** Ask deep and critical questions about the comprehensive human experience - trying to see the bigger picture.

Gardner proposes there are other "candidate" intelligences—such as spiritual intelligence, existential intelligence, and moral intelligence. Although, they don't meet his original inclusion criteria. (Gardner, 2011). Psychologists and teachers have both criticised Gardner's idea. These critics assert that Gardner's eight different "intelligences" are merely metaphors for talents, character qualities, and abilities and that his definition of intelligence is overly inclusive. Despite this, educators find the hypothesis of multiple intelligences to be very popular. Many teachers incorporate Gardner's theory into the classroom and use multiple intelligences in their teaching philosophies.