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Mind's vital role

innovation

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It is now a well-accepted global wisdom that scientific advances-led innovations are the backbone of new economic growth, new jobs creation and solutions to the sustainability challenges of the earth ecosystem. Governments, businesses and universities are pursuing policies and programmes to promote innovation. Ardent critics observe that innovation is a way of culture and requires an appropriate ecosystem to flourish. In this pursuit, the human mind is often overlooked.

Mind is important for diverse human actions which include innovation. Human mind and physical body work in tandem like modern computers. The mind is akin to software while the physical body is similar to biological hardware – with the brain as its central processing unit.

Our thoughts, feelings, sensory inputs, experiences and education trigger the mind and often re-set it. In other words, external as well as internal inputs influence all things an individual can do. The performance of the mind is a composite of diverse mental functions.

The most advanced artificial intelligence is nowhere close to the ingenious human mind, which understands experiences and grasps their meaning. The biological mechanisms of our wandering minds are not yet well understood, but research has begun to yield insights and demystifying the mind is a process that is being conducted in earnest.

For decades, scientists have been investigating the science behind dreams and the constraints on imagination. Most dreams take place during REM (rapid eye movement) sleep, which is crucial for health. The brain is most intelligent, insightful and creative during REM sleep.

Dreaming might be a breeding ground for new ideas as the brain experiments. Most people can improve their dream recall by reminding themselves before bed that they want to.

According to the Finnish neuroscientist Antti Revonsuo, most of the emotions experienced in dreams are negative. Recently, neurologist Isabelle Arnulf compared students' dreaming patterns to their grades. Students who dreamt more often about the test performed better in real life.

Dreams are not governed by the normal laws of physics, and many aspects of dreaming still remain a mystery. William Miller, a psychology professor and co-author of the book Quantum Change, attributes aha! moments or leaps of thought to the resting brain.

The resting brain circuitry is turned on, paradoxically, when we stop focusing on a problem after vexing about it. The resting brain burns 20 times the metabolic resources of a conscious brain. In other words, the resting brain employs the most creative mechanics and is a place to park the problem for the best solutions. Perhaps in the future, science will enable us to separate real happiness from fake happiness.

Memory is a recollection of information and experiences. Nobel laureate Susumu Tonegawa has been studying how we form, store and recall memories. Proteins produced by a specific gene are linked to memory and cognitive processes. Hippocampus, a region of the brain critical for remembering experiences, is only a temporary repository. A memory that we keep for years is held in the neocortex.

His team found brain circuitry that helps to form episodic memories. It feeds information about an experience to the hippocampus through distinct brain cells. A single memory is formed from a pattern of connections between a unique subset of brain cells. In animal models, his team were able to artificially reactivate happy memories by stimulating specific brain cells.

Bruce Lipton, a developmental biologist and author of the book The Biology of Belief, promotes the hypothesis that a cell's behaviour is controlled by its own genetic code as much as the environment. Perception proteins act as the switches that integrate the function of cells with its environment.

Although there is the perception that proteins are manufactured through genetic mechanisms, the actual process is regulated by environmental signals. The unconscious beliefs rooted in our minds early in life contribute to the health and fate of cells later on in life.

According to The MIT Encyclopedia of the Cognitive Sciences, intelligence is the subject's ability to adapt to change and select the environment. Therefore, through external interventions, it is possible to alter the innate predispositions of the mind.

Common characteristics observed among innovators include curiosity, imagination, passion, alertness, energy and joy.

Nations and communities need people with innovative mindsets. And innovative mindsets can be inculcated while leveraging people's innate biological assets. Innovative mindset is a behaviour that perpetuates in conducive ecosystems and cultures.

Biological studies of innovative mindset are gold-mines for future innovations. They will in turn change the face of future innovation. Evolving innovative mindsets and ecosystems will make it possible for future innovations which are not yet imagined.

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