FROM THE DESK OF ...

We are what we learn

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We are what we learn

The other day, I was talking to a friend who was complaining about his students: "They do not read anymore, they do not come to class and I do not think they are learning". I disagree with him – it may be they are not learning what the teacher wants them to learn, but the truth is that they are learning; in fact, all of us are learning all the time.

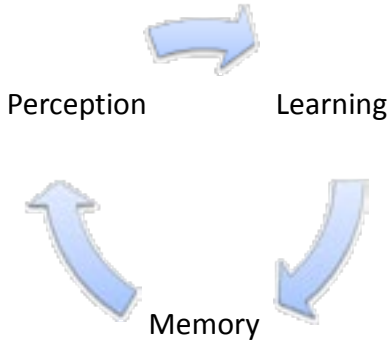
Learning is an essential survival skill and humans, in fact, all living creatures – are built to learn. We are primed to capture how we experience life, code and place into memory what is needed, and then use this new knowledge to learn more. The brain (which is of course the centre of the nervous system), with its sensory input components, is the "device" that drives the learning mechanism. Even in the smallest of animals, the same structures provide the tools for learning.

Humans are the most cognitively complex, adaptable and flexible of all animals. Our adaptability and flexibility is based on our capacity to learn. We learn about, and adapt to, the specific physical and social environment into which we are born.

Perhaps the major difference between humans and other animals is our ability to transmit our learning to other people, indeed, across generations. Language, writing and symbolic manipulation have led us, not only to develop concepts of the world around us, but also to communicate these concepts to others over both geographical distance and time. This skill forms the basis of our ability to adapt to the world and also to change the environment and facilitate our adaptation to it. One element of this adaptation is the ability to store and develop knowledge outside of us – that is, building an extension of our memory and the ability to manipulate that knowledge.

Learning requires an adaptable brain with integrated perception and memory. A key element of learning is the acquisition of knowledge. From the time we are born, we learn and store our learning in memory and that stored information helps shape our acquisition and interpretation of information. We learn from our surroundings, the people with whom we interact. By interacting with others, we shape our understanding of the world. Learning and memory are essential for us to interact with the world around us, from recognising friends, places, feelings, or locations, to behaviour and survival. How we interact with the world is fashioned by our experiences and these experiences are part and parcel of learning.

Our minds are constantly buzzing, with thoughts, emotions, ideas, and sensations. In turn, we develop various habits and behaviours. Whilst we are cognizant of some of these, many are subconscious. In fact, it is implausible that when conscious we have no thoughts or sensations or ideas flowing through our head. Very few, and most definitely not all, of these thoughts, ideas, sensations and perceptions are retained and accessible to us subsequently. Most simply disappear. Some parts of this information we can consciously recall with facility, others only with a trigger or association. Amongst the multitude of ideas that come to our mind, we find the one which we sought, and we recognise it. Other thoughts, ideas and concepts come to mind spontaneously and involuntarily, often triggered by associations that bring them to the fore.



We talk as if perception, learning and memory are distinct; they are, instead, intimately linked. This link leads to the accumulated experience of life, which in turn leads to the interpretation and use of future knowledge. This process results from the conscious and frequently subconscious occurrence of memories, thoughts and ideas that facilitate the interpretation and understanding of fresh experiences and ideas. The factors that constitute our prior experiences are not necessarily in our consciousness.

We sometimes mix learning and memory. Often, we think of "learning" as the process of placing ideas or facts into memory. Without learning there can be no memory, while memory forms the base for new learning. Learning a song, or a new concept in, say calculus, or the phone number of a friend, requires coding information and storing it until needed. Every feature of anything we do is embodied in the brain as arrays of electrical and chemical signals traversing different paths. Each perception stimulates distinct arrangements of the nerve cells and chemicals, and the expression of behaviour has its own distinct array of nerve cells that initiate and control the action. The nerve cells orchestrate to generate pieces of the behaviour.

When we practice something frequently, such as playing tennis, we are reactivating the same circuit of neurons and their pathways and synapses over and over again. After a number of repetitions, the circuit, neurons and the synapses tangibly change, augmenting the efficiency of the circuit and coding the perception or action into long-term memory.

When we learn, the brain is changing and adjusting to reflect the information, so that our learning literally shapes the brain. Our unique life experiences are coded in the brain so that each person's brain is uniquely theirs. Learning arranges, configures and reinforces the brain's networks. It prepares us for the world in which we live.

So what should be the role for schools and universities? Schools and universities should reinforce and optimise lifelong learning. They should become the vehicle for developing new skills and acquiring knowledge that is not easily obtained by other means.

Before writing was invented the only way to communicate was by oral means, and for that information to be retained required memorisation before the information could be used, strengthened or modified. With the advent of more durable means of communicating, such as writing, learning involved the teacher reading the material orally with the student writing it down.

The invention of the printing press allowed teachers to disseminate information by means other than just by lectures. With such a vast variety of knowledge at our fingertips today, the learning needs of today's and also, I submit, of learners of the future will, of necessity, be very different. The value of memorisation has diminished, while the importance of such skills as the ability to access, find, interpret, modify, explore and extend knowledge has increased. Our brain has to adapt to this changing world and so do our methods of imparting knowledge.

Studying the neurosciences, as well as the behavioural representations of how we learn, can better inform us of how to reinforce the innate desire and ability of individuals to learn. The most important message is that we learn all the time, but what schools and teachers should focus on is to develop and implement the best ways to promote and shape the learning of the individual in order to develop the skills they need to work and adapt to a changing world.

The goal of a university education should go beyond preparing students for a future career; it should also prepare them to become more flexible and capable of living well in the real world. The preparation should include the development of values.