

# Lifelong learning

By Professor Jan Willem de Graaf

Professor of Brain and Technology, Saxion University of Applied Sciences, Deventer, Netherlands

**I** have previously argued that an advantage of illiteracy is that people are not bothered by what they already know. On the contrary, in an educated person, novelty acquisition is mainly achieved by organizing and regrouping already present knowledge. Unless you learn a complete new skill with a considerable amount of motor components in it, learning ability is critical depending on the quality of the developed accommodations. What's up with that?

In illiteracy new knowledge and skills are mainly acquired bottom-up, for instance by exploration, imitation, trial and error. In contrast, in literacy, for example, a second language is partly learned through the (top-down) knowledge of the first language. With illiteracy I mean that there is not yet an accommodation (knowledge structure) available in which the to be learned content can be assimilated. As a consequence, in dealing (interacting) with the to be mastered learning contents, new brain cell connections (or configurations of such connections) are formed. This process is comparable with the origin of a river. Because the meltwater flows from the mountain top, it eventually wears out a channel (channeling is then accommodating). The stronger this channel is already formed, the easier new melt water can be absorbed (assimilated) into it. In our brains, innumerable traces emerge. By assimilating activity in these brain traces, ie re-executing learned patterns, the traces become deeper and deeper. In this way, our brain is not just a river, but a complete city that arises bit by bit.

## Historic cities

A historic city reflects the functionality of yesteryear. The floor plan (roads, squares, canals, drainage connections, and sewerage, in short, the infrastructure) and the houses (warehouses, shops, etc) are the result of the "learning" process of the city. The more infrastructure or accommodation there is, the less completely new functionalities can be added. A city built in the late Middle Ages with narrow alleys, canals and high warehouses, can not assimilate the necessarily requirements of a current modern megastore. For example, Middle Age houses do not have hundreds of square meters floors, and the gigantic lorries do not fit through the narrow alleyways. In other words, in the canal houses the customers will have to go up and down the stairs much more often, and the suppliers will have to load their cargo in smaller carts on the edge of the historic city. The city lacks accommodation capacity because there is already too much infrastructure. In fact, the city is literate, but in another time, in a different language.

A city, you can argue, can be broken down and rebuild. Or, and that is usually the case, a new center can be build just outside the historic center, on the pristine (illiterate) ground, which still can be fully adapted to the current requirements / functionalities. However, it is impossible for a human brain to clean it up, remove old brain cell connections, and start over again. And if it were possible - to take the old brain out, and put a new brain in - it would be highly undesirable; the murder of all memories, knowledge and skills.

However, in devising education for lifelong learning, the altered/diminishing learning capacity of the older brain must be taken into account. And that's exactly my point here. Too easily we expect the elderly to build and use, as it were, a mega storehouse in a "city" that has arisen with warehouses and canals. Or with pen and pencil, instead of with tablets and smartphone. Education in the elderly must focus on finding the connection between the new requirements and the present structures. If people have built good accommodations, they can assimilate many processes, including new processes, almost without having to accommodate. But if people have formed less good accommodations, as is also often the case, they will not be able to keep up with many changes in the world (think of packing the trucks on carts on the edge of the center). Really learning new things is possible sometimes. But one has to be relatively illiterate. For example, playing the violin if you have never played a (stringed) instrument may help, because it forces your brain to adapt again. This is exactly where the metaphor is flawed with the city, in our brain we often have lifelong land for free! In short, try to find your illiteracy, even in your old age. Even when elderly, we can sometimes be "absolute beginners"!