COMMENTARY

IMPROVEMENT IN EDUCATION THROUGH NEUROLOGICAL PRINCIPLES

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Universal education is essential in the modern world and is considered to be a human right but it has been badly neglected in many countries such as Pakistan. The process is characterized by poor attendance and dismal outcomes with rote learning, examination orientation, and certification that dominates schooling which ultimately results in poor preparation for the modern world either socially or professionally.

Improvement demands quality education instead of establishing more school buildings. Education and its objectives are poorly understood. The word itself is "ex ducere" meaning "to lead out of" and refers to Plato's cave where shadows on the wall represent reality until the person is led out of the cave (of ignorance) into the real world. The real world is increasingly complex so the classical 3 R's (reading, writing and arithmetic) although still essential, are not nearly enough, particularly if poorly taught – it does not matter what the teacher teaches but only what the student has learned[1].

The other problem is that the object of education is not certification or even knowledge but the prepared mind of Louis Pasteur[2] which echoed Charles Darwin[3] – "It is not the strongest or most intelligent of a species that survive but those with the ability to adapt". The prepared mind is required more than ever in the modern world of medicine and healthcare with the advent of compulsory recertification but is increasingly directed technically – "what and how" rather than the "why" of comprehension at university. This shortcut in the face of a modern knowledge explosion was forecasted by Bertrand Russell and confirmed recently by Atta ur Rahman[4] himself with regard to the Higher Education Commission (HEC). This failure of universities is leading to an intellectual underclass[5] with no one to comprehend the increasingly complicated factors required for future healthcare. Our prime minister was advised to increase investment in the health sector and has decided to build 40 large new hospitals; a poor choice when the sustainable development goals of the United Nations demand prevention of chronic non infectious disease, a priority that requires community interaction not hospitals.

The other major factor in distortion of education is the continued dominance of psychology. This paradigm is now over 100 years old having been initiated by Freud, Jung, Piaget and Montessori among others in over riding Cartesian dualism. Psychology has become more entrenched in everyday life and is regarded by some as an undeclared religious belief system with psychologists as mullahs rituals (events in early life are the cause of disorders) and other rituals (psychoanalysis cures this disorder).

The problem with psychology dominated education is that advances in the understanding of brain function which reveals that some psychological concepts and indeed beliefs are not consistent with brain function. Harvard is now integrating psychology and psychiatry into the hard science of neurology[6]. There is, for instance, no ego or identification which simply reflects expressions of behavioral patterns and play in young mammals is directed towards adult behavior – in the slow maturing human this is social pecking order.

The human brain is a small world connected with hubs[7] and an inclusive model of brain cell multineurological cortical function is now available[8] with biochemical extracellular predictors of Alzheimer's disease changed by alteration in phasic cycling at 90 Hertz[9]. The more difficult problem of

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switching activity off during concentration and consciousness is yielding to topology[10] and graph theory[11]. The major difference between the older psychological paradigms of educations and exploding new neurological discoveries is that learning occurs very much earlier. There are 300 connection seeking neural spikes per second peaking at 3 years[12] and that early life is utilized to form the framework of an individual's personal comfort zone which is protected lifelong from all real or imagined assaults. This concept in which the environment and education are critical was clarified by Daniel Kahneman[13] (an economics Nobelist). According to him, "you commit a murder with your fast error prone brain but have to answer for it with your slow brain in court, connecting the dots rather than emotional or reflex actions". This again highlights the objective of education from a different direction emphasizing the prepared mind of cortical integration rather than hippocampal and amygdaloid memory[14]. With this altering paradigm of education in the modern world, how can we improve education with the resources at hand.

Using the above easily applied modifications of schooling, a pilot study was carried out at Baqai Medical University. When 25 children left for other schools at 6th grade, all were promoted at least 2 classes while some 3 classes and one girl qualified as a doctor with financial help. This pilot study success encourages us that we are on the right path. Hence it is concluded that simple application of advances in neurology to schooling is essential for improvement of early education. The approach to education should be:

i. As at least 50% of early education occurs at home, the parents must be involved.
ii. The child must be given individual hope, direction and how to achieve this (by education). Individuals in the class at start of school stand up, give their name, state what they want to be when they grow up and then state how they are going to achieve this; clearly whatever it is, it involves education. This process can be repeated.
iii. Education following a modification of Schumpeter's principles:

(a) Developing a sense of self-worth through literacy and arithmetic.
(b) Developing a sense of community and environment – history, geography civics.
(c) Developing a sense of morality and ethics, good positive religion is clearly the best way although negative destructive religion is the worst.
(d) Maintaining curiosity aiming at lifelong learning and CNS integration to help in retrieval of information and connecting the cortical dots NOT mnemonics Piaget was wrong. The question why is included in all subjects. Integration is assisted by once weekly explaining why all subjects are taught. Why questions are included in assessments and examinations which emphasize quality concepts and not only memory.
(e) The subjects taught, although compatible with the provincial curriculum are biased towards what the children will need. In particular, as languages will be needed in the future we expect (e.g. the silk route) and languages are easily learned early with the primary centers, the children are taught 3 languages. Pakistanis are very adept at this. Learning languages later is more difficult as secondary centers have to be incorporated.
(f) The status and teaching abilities of teachers have to be upgraded to a level approaching their former eminence, not merely certification and poor examinations.
(g) Balance between the components of education is essential in this early determination of their students "world" view, the framework of their lifetime adaptation. One obvious example in Europe and America is the rise of IS recruits. If children are taught good Islam at home but have mediocre education at school when inevitable stresses arise later in immigrants, religion, good or bad, will dominate.

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