

Theme: Learning in the Perspective of Complex Long -Term Change

Scientific mind: a/Features; and b/ Engineering factors

By: *Faiza Hussein Abd All

(1): Introduction:

The mind is defined by Morin (1999) as an emergence of the brain brought forth by culture, and it would not exist without the brain. While Whitmer stated that the mind is shaped by the information that comes from the body and accordingly it is part of it (1997). But information from neurology indicates that changes in external environment interplay with the changes in internal development of the nervous system. Development of the individual nervous system and its body depends on the environment or the surrounding on which the development takes place. Accordingly the mind is also a result of an interaction between inner and outer environment of the body. There both culture (which is the acquired behavior) and nutrition, are of top significance. Although researches indicated that providing opportunities for complex perceptual and motor experiences can even compensate, at least partly, for deficits associated with early malnutrition (Consultative Group on ECCD, 1990).

The scientific mind as a dimension of human capacity was defined by Visser (2005) as” creative essence of who we are and to understand the extent of complexity of problems we face”. And he also stated that “the essential features of scientific mind are: inquiring, imagination/creative thought, envisioning/prediction, collaboration, dialogue- including respectful dissent;

independence of thought; tolerance of thought of others; practice of establishing ways of coming to agreement construction-building on existing knowledge, seeking beauty, integrity, wholeness, and parsimony.

(b): Suggested Features:

The present paper establishes the following as important essential features for a scientific mind to be added to what previously stated by Visser:

(1): Ability to solve special problems could be one of the ingredients. Simon expressed, the human mind is a “G.P.S. (General Problem Setter and Solver). “There is a correlation between mobilizing knowledge of the whole and activating general intelligence. Education should encourage the natural aptitude of the mind to set and solve essential problems and, reciprocally should stimulate full exercise of general intelligence” (Simon in Morin, 1999). (2): Understanding: If any change of a state is needed, understanding is the first step to achieve. “It has become crucial for humanbeings. This is why it should be one of the finalities of education in the future” (ibid). (3): A third vital element is freedom of opinion and expression. (4): critical abilities: Critical abilities, not seen as a strategy of “exchanging and replacing” but in-depth reading of ideas can lead to advancement of knowledge, to new notions and possibly new concepts and theories. This is what people in underdeveloped/Third world need because Gran in his book ‘The Islamic Roots of Capitalism’ in ‘Shades of Modernity’ as cited by AlNgash (2006), stated that: “the writing of history of Middle East explores existence of long-lived problems related to creation of appropriate concepts” – a matter that hinders immensely our contribution in knowledge building. (5): Ability to compare: It is important in the process of understanding information as well as in the understanding of who ‘we’ are and the ‘other’. Because who ‘we’ are will depend in part on the simultaneous definition of

'other', those whose differences enable us to see who we really are. The urge for comparativism is almost an epistemological necessity in all practical social thought although it is shot through with the distorting influence of partiality and unequal relations of power (Favell, 1999). (6): To think globally (whole/part relation) is also an important feature because in the 20th Century we reached the stage of globalization and as the geographer Jacques Levy so well expressed it, "the emergence of a new object, the world as such"(in Morin, 1999). And this is intensified by the reality that "the community fate of earth imposed solidarity as a vital necessity" (ibid). This way of thinking leads to creation of a link between knowledge and ethics - that generally education systems are bare of- and as well as it enhances feelings of societal and global responsibilities. Especially after the statement on global warming given by U.N.'s Intergovernmental Panel on Climate Change (IPCC) on Feb.2002 that concluded "evidence of the earth's rising temperatures was "unequivocal"- and that this warming was more than 90% likely the result of human activity. And the price of inaction will be enormous for all of us. This necessitates a need for raising the climate stakes.

Also "Learning about the world as world has become a vital and intellectual necessity and it needs ability to organize knowledge" and recompose the whole in order to know the parts (Morin.1999 & Mauss, in Morin, 1999). This leads to appreciation of diversity, of colour, ethnicity, gender, cultures and opinions and thoughts and ultimately respect of the other and then establishing ways of coming to agreement and avoidance of violence. Ultimately this leads to democracy. Again this feature of scientific mind leads to creation of intimate relationship between all sciences as all are explaining one word in one hand and creation of high- minded people on the

other hand. Accordingly “scientific mind be one of the ingredients of peace” -as came during the last scientific colloquium- at the individual, societal and world levels. (7): The ability to use a comprehensive scientific and rational way of thinking. Science is “a path-a way and a process through which we acquire knowledge, we create knowledge and ultimately the path leads us to discover truth. The basis of science is logic, logical freethinking, and independent observations and information dependent analysis. Science “is actually exploring and ‘getting’ it less ‘wrong’ rather than getting it right (Grobstein, 2005). Where the rational activity of the mind is what allows us to distinguish dream and reality, real and imaginary, subjective and objective. It is the fruitful of debates of ideas and not a property of a system of ideas and it is a safeguard against error and illusion as stated by Morin (1999). The scientific explanation of social, intellectual, historical, economical and educational phenomena helped Ibn Khaldon (1332 -1406) to produce unprecedented knowledge of reverence to these phenomena and accordingly he was considered as one of the establishers of Western modernity sources. (AlNashar, 2006).

(8): Active participation: It is needed at both the theoretical and practical levels. It motivates interest and commitment, enhances means of communication and thus helps create agents of change at all levels (individual, communal and global levels).

©: Suggested Engineering Factors:

The following are suggested to be important engineering factors for a scientific mind:

(1): Affectivity: Edgar Morin stated that intelligence and affectivity are closely related: the ability to reason can be diminished or destroyed by an

emotional deficit, and impaired ability to react emotionally may cause irrational behaviour (1999). And he added “in some respects emotional capacity is an absolute necessity for the functioning of the rational behaviour”. Also Damasio indicated close association between intelligence and emotions (in Morin, 1999).

(2): Nurturing of the brain: Nurturing the environment of the mother’s womb with essential micro and macro- elements is of paramount importance for growth of the fetus and of course its brain that the mind is –as earlier identified- is an emergence of it and would not exist without the brain (Morin, 1999). Medical studies indicated that “during the fourth and the ninth months of gestation, the brain and nervous system develop. The baby can move his/her body parts, sense things in the mother environment, interact with what is happening in its womb, feel emotions, and develop memories. The fetus can be harmed if the mother lacks vital substances. For instance, folic acid is needed for cell division and DNA synthesis. New tissue can not be formed unless all the essential amino acids are present in the diet. If the mother doesn’t have enough of folic acid for her unborn child, cells may not divide properly, structures may not form as needed, and the neural tube may not close. If the neural tube doesn’t close, amniotic fluid harms the brain and the spinal cord. Nurturing of the brain is needed actually all through life. In fact some parts of the brain do not reach maturity until adolescence. However, nourishment is needed in all other stages of life as well as for biological, physical and mental activities. We have a saying which says: “A healthy mind is in a healthy body”.

(3): Culture: Culture is defined as “learned behaviour which has been socially acquired”. Culture is the product of human societies and man is the

product of it. “the tradition, belief, thought, behaviour (smoking, alcoholism... etc), laws, moral percept, and other capabilities and skills that are acquired by man as a member of society (Park,2005). Culture affects fetus/child and mother physical and mental health. Religion may restrict free thinking and research because it restricts individual liberty towards free thinking to reach a modern know- how. Civilized culture “free of superstitions” helps us to understand the extent of complexity of problems we face. That means it promotes scientific thinking and i.e. scientific mind as the mind itself is brought forth by culture (Morin, 1999). Also conventional societies may be better able to cope with change, and modern societies are perhaps best adapted to assimilate rapid change. And equally, individuals belonging to these societies acquire the same characteristics. Also researches indicated providing opportunities for complex perceptual and motor experiences for the disadvantaged children “can even compensate, at least party, for deficits associated with early malnutrition (Consultative Group, notes# 1 &11). It goes without saying, that ‘man can not live only on bread’ and thus the cultural elements are important in development.

The language may exclude the girls from education and constitutes one of violence mythos.

(4): Patriarchy: It is the system of power that mainstreams societal structure and resembles the father’s model that originates from him and dominates itself in his social relations and the civilization as a whole. In this way this type of culture is explicitly, and, at the same time, implicitly manifesting itself, and deceives us in the deepness of ourself (Shrabi, 2000). Patriarchy becomes an existence that by - pass all times crossing all generations to the extent that it is possible to talk now about modern -patriarchy and post -

modern patriarchy (Mabrouk, 2003). Patriarchy is responsible for violence against the 'other' and the other in the 'Patriarchal culture' is the women.

(5): Interplay between external environment and development of individual nervous system and its body. Evidence of development of nervous system and continuous softening of individual reflexes and adaptation in internal and external changes indicate that "the vision that sees that development of an individual human being repeats the history of man kind is a false theory" (Porfis, see Whitmer,1997). Explanation of the adaptation and the experience includes systems of thoughts and emotions that are interconnected with the chemical and nervous systems of living organism (Whitmer, 1997). The memory functions as the 'expected behaviour' that stores explanations of our experiences' in symbolic recalls (Whitmer, 1997). But "it is difficult to explain power of these symbols on us unless we learn them by the coexistence of our strong emotional experiences (Litod and Libsidg, 1989).

(6): Integrity of the mind: "Well balanced mental health supports self-esteem and self-confidence, provides pathways to resources; supports healthy relation with others, encourages positive decision making and provides basis for good overall health. Long term prenatal stress exposure affects the brain development and leads to poorer school grades at 6 years" (Soclchany, 2002). Early (1959), Benedac stated that "pregnancy is an opportunity for personality development as well as mental growth and development for the baby, the mother, and the father" (in Soclchany, 2002). Some genetic diseases lead to mental retardation.

(7) Interests: Numerous interests come into play in a communication situation. Most significant are our own interests- of security, pleasure, and self esteem. Among other types of interests, "one must not overlooked the

social, regional and national interest that shape our selection of communications, and also the way we perceive them (Park, 2005).

(8) Intelligence: The widely accepted definition is that: it is the ability to see meaningful relationships between things. It includes perceiving, knowing reasoning and remembering. Psychologists believe intelligence results from an interplay between heredity and environmental factors. There is considerable relationship between a person degree of intelligence and range of activities, the level of achievement and depth of understanding possible to him (Park, 2005). Part of these is the ability to be creative, rational and ability to understand (to grasp text and context, part/ whole relationship and to think globally) also seeking beauty and wholeness and integrity.

(9): Learning: Learning is any relative permanent change in behaviour that occurs as a result of practice or experience. It is necessary for man's survival and for human progress. Thus, it should be of the type "that can grasp subjects within their context, their complex, their totality" (Ospina, in Morin, 1999). Due to the very advanced learning ability of human beings, it is a must for a human being to be a humane through culture (Montague in Whitmer, 1997).

(10): Linking study of modern science with its history, philosophy and methodologies that produces it. This makes science very nearer to our mentalities and imaginations and creates science producers and not only consumers and as well makes links the science with society.

(11) Strategy of pedagogy: Participatory approach should be stimulated and encouraged at all levels of education in order to stimulate the inquisitiveness of the learner. This will create active learners who can be expected to contribute effectively to change at individual, communal and international levels.

Therefore, there is a need to shun passive memorization and ‘spoon – feeding’ in education.

(d) Discussion and Conclusion:

According to the definitions given above to the scientific mind, it becomes evident that information and culture shape our minds. Although, education to some extent has a relative autonomy yet it remains to be one of powerful means through which societies/ regimes pass their own culture to their people and future generations. Possibly, because it is a tool for change, as it has been considered one of fundamental human rights which appeared in the Universal Declaration of Human rights (1948) and in the two covenants of ‘Economic, Social and Cultural Rights’ and the ‘Civil and Political Rights’ in 1966. Of late, (1989) the Child Rights Convention (CRC) emphasizes this right. Art. 29 of the CRC, states that: the education of the child shall be directed to (a) “development of the child’s personality, talents, and a mental and physical abilities to their fullest potential. (b) The development of respect for human rights and fundamental freedoms, and for the principles enshrined in the Charter of the United Nations.(c): The development of respect for the natural environment. Whereas, Art. 30 gives the child belonging to minority the right to “...to enjoy his or her own culture, to profess and practice his or her own religion, or to use his or her own language. Since these principles and values enshrined in the child rights constitutes important features of the ‘scientific mind’, development of the scientific mind as a human dimension is considered by the present study, as a fundamental human right to be respected although it is not explicitly stated in the Child Rights Convention. Previously, the intimate relationship between the human development in its all dimensions and the human rights

was highly emphasized by the United Nation Development Programme (The Arab Human Development Report,2002). Thus, the human rights are needed for life but for a life of dignity – a life that is worthy for human beings to encounter. As such the targeted culture to prevail is the culture of human rights. That is “significantly shaped by the practice of human rights, which is rooted in a substantive vision of man’s moral nature. The relationship between the human nature, human rights, and the political society is “dialectical’. The human rights shape political society, so as to shape human beings so as to regulate the possibilities of the human nature, which provided the basis for these rights in the first place” (Donnelly, 2003). So the scientific mind as a dimension of human capacity is in dialectical relationship with the human culture that produces it. Accordingly, the suggested lists of these features of the scientific mind and their engineering factors are exclusive but not inclusive as the human culture is very rapidly changing. We hope such a change should be serving humanity purposes to the extent that the world may resemble a factory and our healthy ‘scientific minds’ are its machines that thinks about our common future.

- Faiza Hussein Abd Alla
School of Health Sciences, Ahfad University for Women, Sudan.
e-mail: Faizahussein@hotmail.com

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The present article rests on a study about analysis of the pre-school formal education from a human rights perspective by the same author. While the current article looks particularly on whether or not this curriculum affects the development of a child’s scientific mind and effect of this mind on child’s rights namely education, sustainable development and peace.

itself. It is responsible for violence against the 'other' (women). The nature of power that mainstreams all relations in the society is the high power. The one who has the power in the society (or the one who acts on behalf of him) is the one who possesses and gets the benefit, whereas, the others just accept and obey. The 'boss' in our societies, is the one who always uses his power, rules and dominates. Decisions taken without consult of the majority of people which suppose to constitute the target of decisions. The boss who has the power and status in the society he is just a magnification of the father's power in the family with his reactions, his opinion on himself and his relationship with others whom are subordinates to him – he is the one who manifests the power that every one of us experienced it his family before he lives it in the society to the rest of his life. From as a power it is seen as a means of perpetuation of a certain trends of life.

Superincumbent