

## Teaching And The Human Brain: Strategic Interventions In Curriculum Redesign For Mba Program In Mekelle University, Ethiopia

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**ABSTRACT:** The report is a proposal for strategic interventions in the curriculum of the MBA program in Mekelle University. Based on my experience in the university and its strategic documents and findings, although there have been reform programs in the university, of which curriculum redesign is one element, there are strategic issues that are still major concerns challenging the attainment of its mission and strategic objectives. To address strategic issues related to curriculum, based on the basic principles of the mind and the theories of learning and their implications for instructional curriculum design the report presented the interventions, rational and examples of the strategies in designing a curriculum for the MBA program in the university. In doing so, although the comprehensive description of the neurological findings that have implications for the design of instructional strategies and curriculum is beyond the scope of the study, it summarized some of the findings that will help as a background in proposing strategic interventions in the MBA curriculum. Accordingly, first the major neurological findings regarding how the human brain works have been briefly presented. Then the general theories of learning that will have a profound impact on curriculum design taking Caine and Caine (1991) principles of brain based learning have been summarized. And finally, based on our understanding of the basic principles of the mind and the theories of learning and their implications for instructional curriculum design the report presented the interventions, rational and examples of the strategies in designing a curriculum for the MBA program in the university.

**Keywords:** Brain based learning; theories of learning; curriculum redesign; neurology

### INTRODUCTION

In order for having a sustainable competitive advantage, organizations are generally recognizing the crucial importance of flexible and creative graduates as a competitive weapon to exile in the global competition. Accordingly, it is a must to consider alternatives of the traditional theory and practice of teaching methodologies based on memorization (Sawyer, 2011). Accordingly, rather than thinking the familiar we have to accept the dynamics and complexities in learning and in that regard we have

to follow a complex framework that integrate human behavior and perception, emotions and physiology (Caine & Caine, 1991). Such a shift in thinking has challenged the generally held myth about the human brain like creativity is in the right side of the brain (Sawyer, 2011). And it calls up on accepting the complexities, ambiguities, and uncertainties involved in developing effective teaching and learning programs that take in to account the multidimensional and complex interactions of human beings taking place in the issue at hand.

In this regard, we have to look –historically, theoretically, and practically how the fields of neuroscience, psychology, and education are working together to get a more cohesive understanding of the physiology of the brain, and to implement learning in more effective ways (Butler-Kisber, 2011). In other words, we need to have a framework that integrates the findings from cognitive psychology, education, philosophy, sociology, science and technology, the new physics and physiological responses to stress, as well as the neurosciences (Caine & Caine, 1991).

Consequently, there is a very challenging task in teaching the human brain based on a real understanding of how the brain works, that demand significantly the finest minds and intellects. (Caine & Caine, 1991). Accordingly, although the comprehensive description of the neurological findings that have implications for the design of instructional strategies and curriculum is beyond the scope of the study it is good to present some of the findings that will help as a background in proposing a new MBA curriculum in Mekelle University of the College of Business and Economics in Ethiopia. In doing so first the major neurological findings regarding how the human brain works will be briefly presented. Then the general theories of learning that will have a profound impact on curriculum design will be assessed. And finally, based on our understanding of the basic principles of the mind and the theories of learning and their implications for instructional curriculum design I will present the interventions, rational and examples of the strategies in designing a curriculum for the MBA program in the university.

## **1. NEUROLOGICAL FINDINGS ABOUT THE HUMAN BRAIN**

Although there are good developments in neurology research that significantly enhance our understanding of the human brain, we should be cautious in applying the findings in actual education (Sousa, 2011). The reason among others as pointed out by the same author are associated with –critics who believe that educators should not be using brain research at this time in schools and classrooms because it will be years before this research has any application to educational practice. Others fear that unsubstantiated claims are being made, usually referred to as –neuromyths, and that educators are not sufficiently trained to tell scientific fact from hypel ( p. 38).

Despite such criticism many researchers like Hart for the first time have tried to establish logical links between brain functions and education practices (Degan, 2011). Consequently, the crucial importance of neuroscience findings on teaching practice has been increasing and educators are trying to incorporate research output in to their practices. Thus, -In the past two decades, researchers have acquired so much information about how the brain learns that a new academic discipline has been born. Called educational neuroscience or mind, brain, and education science, this fledgling field explores how research findings from neuroscience, education, and psychology can inform our understandings about teaching and learning, and whether they have implications for educational practice (Sousa, 2011, p. 38).

Accordingly, there are influential neurological findings like: neuroplasticity, neurogenesis, brain's inability of multitasking, the capacity limits of working memories, the impact of emotions in memory and recall, the critical role of movement and exercise in enhancing learning and memory, the impact of circadian cycles on focus, the negative effects of sleep deprivation and stress in learning and memory, the recognition that intelligence and creativity are distinct abilities that can be nurtured by environment and schooling rather than genetically determined, and the positive contribution of arts in enhancing the brains potential, and the school's social and cultural climates and their role in teaching and learning and their logical link to instructional design and curriculum should be considered in order to design effective, efficient and meaningful strategy for educational programs (Sousa, 2011).

These findings and their implication for teaching and learning has been clearly elaborated by (Caine & Caine, 1991) as follows and they will serve as conceptual framework for this study.

## **2. PRINCIPLES OF BRAIN BASED LEARNING**

Cain and Cain (1991) come up with the following 12 principles of brain based learning that have significant implications for education:

- 1) The brain is a parallel processor. The brain ceaselessly performs many functions simultaneously. Thoughts, emotions, imagination, and predispositions operate concurrently and interact with other brain processes involving health maintenance and the expansion of knowledge. Education must embrace and use all the dimensions of parallel processing. Learning engages the entire physiology.

- 2) The brain functions according to physiological rules. Learning is as natural as breathing, and it is possible to either inhibit or facilitate it. In fact, the actual "wiring" of the brain is affected by our life and educational experiences. Anything that affects our physiological functioning affects our capacity to learn.
- 3) The search for meaning is innate. The search for meaning (making sense of our experiences) is survival-oriented and basic to the human brain. The brain needs and automatically registers the familiar while simultaneously searching for and responding to novel stimuli. Both familiarity and novelty must be combined in a learning environment.
- 4) The search for meaning occurs through "patterning." In a way, the brain is both scientist and artist, attempting to discern and understand patterns as they occur and giving expression to unique and creative patterns of its own. The brain resists having meaninglessness imposed on it. Effective education must give learners an opportunity to formulate their own patterns of understanding. That means learners need a chance to put skills and ideas together in their own way.
- 5) Emotions are critical to patterning. What we learn is influenced and organized by emotions and mindsets involving expectancy, personal biases and prejudices, self-esteem, and the need for social interaction. Emotions and thoughts literally shape each other and cannot be separated. An appropriate emotional climate is indispensable to sound education.
- 6) Every brain simultaneously perceives and creates parts and wholes. Although there is some truth to the "left-brain, right-brain" distinction, that is not the whole story. In a healthy person both hemispheres interact in every activity, from art and computing to sales and accounting. The "two-brain" doctrine is most useful for reminding us that the brain reduces information into parts and perceives holistically at the same time. Good training and education recognizes this simultaneous perceiving and creating of parts and wholes. One way to accomplish this is by introducing global projects and ideas from the very beginning.
- 7) Learning involves both focused attention and peripheral perception. The brain absorbs information of which it is directly aware, but it also absorbs information that lies beyond the immediate focus of attention. In fact, the brain responds to the entire sensory context in which teaching and communication occur. These "peripheral signals" are extremely potent. Educators, therefore, can and should pay extensive attention to all facets of the educational environment.
- 8) Learning always involves conscious and unconscious processes. Much of our learning is the result of unconscious processing. Moreover, it is the entire experience that is processed. That means that much understanding may NOT occur during a class, but may occur hours, weeks,

or months later. Educators must organize what they do so as to facilitate the subsequent unconscious processing of experience by students.

- 9) We have (at least) two types of memory systems: spatial and rote learning. Our natural spatial/autobiographical memory system registers everything -- down to the details of your meal last night. It is always engaged, is inexhaustible, and is motivated by novelty. We also have a set of systems for rote learning, or recalling relatively unrelated information. These systems are motivated by reward and punishment. Thus, meaningful and meaningless information are organized and stored differently. The only way for people to deal effectively with vast amounts of new information and regular retraining is to learn for meaning.
- 10) The brain understands and remembers best when facts and skills are embedded in natural spatial memory. Our native language is learned through multiple, interactive experiences. It is shaped by internal processes and by social interaction. Any complex subject is given meaning when embedded in real experience.
- 11) Learning is enhanced by challenge and inhibited by threat. The brain learns optimally -- makes maximum connections -- when appropriately challenged. But the brain "downshifts" -- becomes less flexible and reverts to primitive attitudes and procedures -- under perceived threat. Educators must create and maintain an atmosphere of relaxed alertness, involving low threat and high challenge. That also needs to be the state of mind of the instructor. Above all, learners need to acquire a belief in their capacity to change and learn.
- 12) Every brain is unique. We all have the same set of systems, and yet we are all different. Choice, variety, and multisensory processes are essential for brain-based learning and instruction.

Based on the basic principles of the mind and the theories of learning and their implications for instructional curriculum design I will present the interventions, rational and examples of the strategies in designing a curriculum for the MBA program in the university.

### **3. INTERVENTION STRATEGIES IN DESIGNING CURRICULUM FOR MBA PROGRAM**

Before proposing intervention strategies in designing curriculum for MBA program in Mekelle university it is crucial to see the vision, mission and strategic concerns of the university that will shape the type of intervention.

## **Mission, Mandates, Vision and Values of MU**

As per the Mekelle University's Legislation and strategic plan documents the Mission, Vision and Strategic concerns of the University are illustrated as follows:

### **Mission**

Mekelle University (MU) is dedicated to providing quality education, research and community services to meet the needs and aspiration of the Ethiopian and the world society. Thus, the university is mandated with the following missions:

- Advancement of knowledge through realistic and contextual education, reliable and relevant research, innovation, and technology transfer to contribute to the economic growth and welfare of the society
- Production of graduates fully equipped to achieve the required personal and professional standards
- Provision of societal needs tailored and ethical community service

### **Vision**

Mekelle University aspires to be one of the most preferred universities in Ethiopia and to be one of the top 30 in Africa and one of the top 300 higher education institutions in the world by 2020

However, based on different assessments conducted like the Institutional Quality Audit (in which I was part) and the SWOT analysis, the following areas of concern remain to be the strategic issues that have to be addressed by the University:

1. Inadequate graduates who are aligned to developmental policies and programs of the country (both in type and in number)
2. Lack of thematic area focused and problem solving research undertakings or the need to align research thematic areas to national priorities
3. Limited community services that are tailored to community problems and developmental policy of the government
4. Inadequate modern facilities that support the quality of education, research and community services

5. Lack of strong M & E system
6. The Need for providing accessible services that are cost saving and affordable
7. The Need for good governance, proactive and effective leadership and staff capacity building
8. The Need for internationalization/networking
9. Absence of strong staff motivating system/environment
10. Need for diversified financial resources (income generation)
11. Weak educational background of students
12. Lack of chartered autonomy
13. Need to address cross-cutting issues
14. Need to integrate work units and redefine jobs and structure
15. Need to address the inefficiency of procurement , Facility Management and Property Administration

To address such strategic concerns the university has introduced initiatives like BPR, Balanced Score Card, and Competence Based Education (CBE) as a strategic tool in order to remedy the strategic problems of the University. However, these reform agendas were not able to get the required results.

For example, to solve the practical aspects of the problem in higher learning institution in Africa in general and Ethiopia in particular countries like Mozambique, Ghana and Ethiopia has introduced Competence Based Education. Regarding this issue Kouwenhoven (n.d.) concludes that emerging model of competence based education is believed to be a good response to the current need of stakeholders especially in developing countries that look for graduates with transferable skills rather than disciplinary skills. However, the same author contended that –the experiences in three African countries show that it is possible to develop and implement competence-based curricula in a higher education context. However, more research is needed on the effectiveness of CBE and particularly whether such innovations are sustainable when external project funding comes to an end (p. 143).

The other challenge of such initiatives that challenge the emerging curriculum that emphasize on transferable skills is that although higher institution education is supposed to have some training components that focus on transferable skills, education is far from training. Hence arguments that are polarized in such dichotomy of traditional curriculum vs. emerging (like competence based) are challenged (Parker, 2003).

Although addressing all strategic concerns of the university in general and the MBA program hosted by the University in particular are beyond the scope of this proposal, I will try to present some strategic interventions in the MBA program of the university.

The MBA program envisioned that education, the growth of sustainable business and prudent economic policies will eventually enable people in Ethiopia to enjoy the same standard of living as people in Europe, America, and other parts of the world have achieved already. The mission of the MBA is to educate and motivate its students to contribute to the required growth of business and to the analysis and design of prudent economic policies.

Therefore, the MBA's main objectives are the following:

- To educate and train its students to become first-rate business executives, entrepreneurs, or economists,
- To conduct relevant and high-quality research in Business and Economics, and
- To provide continuing education, consultancy and other services to the community, private, governmental, and non-governmental organizations.

However, like other departments and programs in the university the MBA program shares the general challenges that hinder the attainments of its missions and strategic objectives.

Accordingly, the following strategic interventions are proposed by the writer based on the brain based learning principles that are believed to address the problems of the curriculum in the MBA program.

In proposing these curriculum reform initiatives maximum care will be taken not to transplant what are proposed in the West in to the Ethiopian context which has its own unique characteristics. In other words, -Caution needs to be used here as this may be a westernized notion of the impact of global forces on university forms, as the role of different histories and the different influences of the nation state are significant in many areas of the globe (for example in Africa, China and India) (Pegg, 2013, p. 12).



One of the criticisms of the MBA program in the University is that there is no vital link between theory and practice. The students are taught with the different theories and they are expected to memorize them without linking to reality. This is the traditional approach to learning which should be replaced by learning style that is based on an understanding of how the brain works.

In this regard, the first intervention required is the curriculum should be designed in such a way that rather than telling students the different theories in the different functional areas of management, we have to create an environment that fosters the students motivation in critically understanding the concepts and philosophies involved behind each theory, in what contexts it has been developed. In this regard as recommended by Caine and Caine (1991) the learning and schooling environment be designed like life experience and enable students relate what is going on in class with their environment. The reason for doing this is that instruction based on rote memorization does not last long. In other words, once the exam time has passed students will forget the theories learned in the subject. Good example in this regard is in teaching Maslow's Hierarchy of needs theory, rather than telling students the five hierarchies and forcing them to memorize, It is good to show the philosophical foundations of the theory, and in what societal conditions they have been conceived and ask the students whether this is in line with the behavior of human beings in the Ethiopian context. Beyond that, we should try to discuss the implication of this theory in management decision making.

The second intervention is after having rigorous understanding of the academic theory, mechanisms has to be devised in how such theory can be applied in real world practice. This is crucial because we are planning to produce graduates who can influence the current practice of business by responding to the dynamic business environment that we are in. In this regard, we can devise instructional designs like arranging guest speakers from different organization and share their experience to our students, cutting age research has to be made by professors in the program in order to relate theory and practices, students should be exposed to real world through different programs like company visits, practical attachment and research.

On top of that to solve the problems associated with the professors in the program in failing to relate theories with practice as many of the professors in the program do not have practical managerial experience in different organizations the following interventions are proposed: In order to fill this gap concerted efforts has to be made by developing programs that enhance professors exposure to

real world practice of business. Among others, increasing representations in the board of directors of many organizations in Mekelle, allowing joint appointment for professors to devote some percentages of their time in industries, and practically influencing them take sabbatical leave are very crucial in such efforts.

As it has been pointed out by Caine and Caine (1991) as thoughts, emotions, imaginations and dispositions are undertaken by our brain concurrently we have to introduce these dimensions in our instructional designs in order to make teaching and learning effective. In other words as pointed out by (Kolb, 2005) –Learning is a holistic process of adaptation to the world. It is not just the result of cognition but involves the integrated functioning of the total person—thinking, feeling, perceiving, and behaving (p.2). In this regard, incorporating arts in management training are very instrumental (Nissley, 2010). Accordingly, Mekelle University should incorporate art in its MBA program.

Most of the MBA students in Mekelle University are bombarded with many assignments and are exposed to very long lecture hours without considering the physiological conditions of the graduates. However, many neurological findings recommend the consideration of physiological conditions in curriculum design. Accordingly, the students of the MBA program should be advised in such a way that they consider their physiological well beings as they have remarkable implications for their brains learning capacity.

The information brought for teaching should enable students to create patterns (Caine & Caine, 1991). Accordingly, rather than providing theories in different functional areas of management as independent pieces of information we should create logical links to the problems of managerial decision making.

Beyond cognitive considerations the emotional mindsets of our graduates impact the brains attention systems (Sousa, 2011). Thus, by developing learning environment that can arouse the emotions of learners concerted efforts have to be made to make students remember by linking experiences related emotions.

Human brain simultaneously process parts and the whole (Caine & Caine, 1991). The instructional environment should address parts and the whole concurrently. In the MBA program students should be encouraged from the beginning how the different functional objectives are integrated to create synergy and achieve the organizational objectives.

Beyond the immediate attention of the learner educators should consider all facets of the educational environment that impact learner's attention (Caine & Caine, 1991). In other words as pointed out by (Farrell, Devlin, & James, 2007, p. 14) –premium quality learning spaces, resources and technologies should be in place. In this regard as pointed out by Sousa (2011) peripherals like visual aids has to be consciously organized as they have positive roles in enhancing students attention, special skills and creativity. In the MBA program beyond the focus of all cognitive materials the artistic designs of the class room environment has to be one focus of our instructional strategy.

Conscious and unconscious processes are involved in learning (Caine & Caine, 1991). Hence, educators have to design instructional strategies that allow participation of students and ultimately make them charge of learning and their effort in the inference of meaning. In this regard, courses in the MBA program should be designed in such a way that the students will keep to learn and develop meanings after their class room experiences.

Spatial memory and rote learning are the two types of memory that human brain has. These types of memories are organized differently by the brain and they require different efforts. The rote learning or memorization generally requires more practice and rehearsal. As the memorization impede learning and further development of understanding instructional designs has to be based on spatial memory which is embedded in natural memory (Caine & Caine, 1991). Accordingly to be effective the MBA program in the university should be based on real life activities like: case analysis, practical demonstrations, experience shearing trips, practical attachments among others.

As threats are dysfunctional and challenges are functional in enhanced learning educators has to create relaxed alertness in students (Caine & Caine, 1991). The MBA program courses should be designed in such a way that reasonably challenging requirements are incorporated but care has to be taken not to create stress that emanate from threats. As it has been expressed earlier some professors give excessive assignments beyond the capacity of students and at the sometime discourage student's motivation using meaningless warnings to students. On the other hand some instructors make the course very routine and with no challenge which can also decrease the appetite of the learner for the course. Hence, we should avoid both extremes and strike a balance for effective learning to course.

As each person is unique teaching environments should be designed incorporating the individual differences of the learners (Caine & Caine, 1991). As students differ on their preferences in style of learning, background, capacity the instructional design should incorporate the different preferences of students. Accordingly the MBA curriculum in MU should be designed taking in to account the individual differences of the learners. In doing this instead of focusing only one instructional method the courses in the program should be taught using different mixes.

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