Core principles of brain-based learning

Renate and Geofrey Caine have stated the core principles of brain-based learning in Making Connections: Teaching and the Human Brain (1991,1994)

1. **The brain is a parallel processor: it can perform several activities at once. Renate and Geoffrey Caine (1991,1994) claim that thoughts, emotions, imagination and predispositions operate simultaneously and interact with the expansion of general social and cultural knowledge.**
2. **Learning engages the entire physiology: Everything that affects our physiological functioning affects our capacity to learn**
3. **The search for meaning is innate: the search for meaning is survival oriented and basic to the human brain**
4. **The search for meaning occurs through patterning: Patterning refers to the meaningful organization and categorization of information. The brain is designed to perceive and generate patterns, and it resists having patterns imposed.**
5. **Emotions are critical to patterning: What we learn is influenced and organized by emotions.**
6. **The brain processes wholes and parts simultaneously: There is evidence of brain laterality; however, the two hemispheres are inextricably interactive.**
7. **Learning involves both focused attention and peripheral perception: The brain absorbs information of which it is directly aware, but it also incorporates the one that lie beyond the field of attention.**
8. **Learning involves both conscious and unconscious processes: Signals that are peripherally perceived enter the brain without the learners' awareness and interact at unconscious levels.**
9. **We have two types of memory: spatial and rote: The spatial memory system does not need rehearsal and allows for instant memory of experiences. The counterpart of the spatial memory system is a set of systems designed for storing relatively unrelated information. (rote)**
10. **We understand and remember best when facts and skills are embedded in natural, spatial memory: Spatial memory is generally best invoked through experiential learning.**

11. **Learning is enhanced by challenge and inhibited by threat: The brain downshifts under perceived threat and learns optimally when appropriately challenged.**
12. **Each brain is unique: we all have the same set of systems, but they are integrated differently in every brain.**

In the following section, we will deal with brain-based learning and education

Brain-based learning and education

In order to apply brain-based learning, teachers should make use of three instructional techniques: 1) Orchestrated immersion 2) Relaxed alertness 3) Active processing.

Orchestrated immersion: Orchestrated immersion means to create learning environments that fully immerse learners in an educational experience. The idea is to take information off the page and blackboard to bring it to life in the minds of students. Orchestrated immersion provides learners with rich, complex experiences that include options and a sense of wholeness.

Relaxed alertness: Relaxed alertness means to try to eliminate fear in learners, while maintaining a highly challenging environment. Relaxed alertness is not the same as being calm and unchanging. It is a dynamic state that is compatible with great deal of change. Relaxed alertness ensures that students are being challenged within a context of safety. It also includes a personal sense of well-being that allows students to explore new thoughts and connections.

Active processing: Active processing means the consolidation and internalization of information by the learner in a way that is both personally meaningful and conceptually coherent. It is the path to understanding, rather than simply to memory. Active processing necessarily engages emotions, concepts and values.