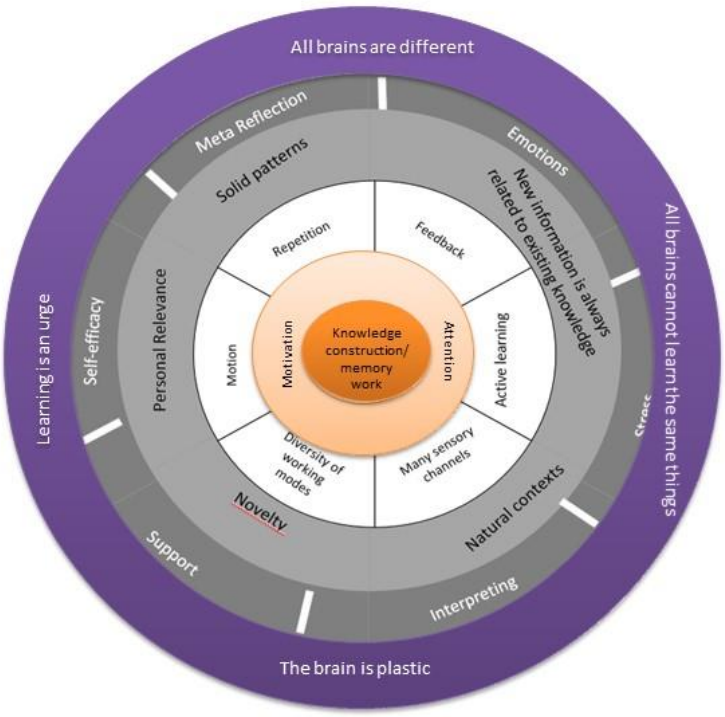
The Brain and Learning
The APL-model



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Overview of the 26 categories of the APL-model (The Brain and Learning)

Factors of importance for our overall approach to teaching/learning

1. All brains are different.
2. All brains cannot learn the same things.
3. The brain is plastic.
4. Learning is an urge.

Factors that can deliver strategies for optimizing the learning process

Behaviour

5. Emotions: emotions are important in (the fuel of) the learning process.
6. Stress: stress has a positive and a negative impact on the learning process.
7. Interpreting: the brain interprets other peoples' gestures, body language, facial expressions and voice with consequences for how the individual takes up other people's information.
8. Support: all types of support are important for the learning process; in our context, support is primarily teaching.
9. Self-efficacy: if the student's belief in his or her capabilities within a certain discipline is strengthened, the learning process runs more smoothly.
10. Meta Reflection: meta reflection supports the learning process – not least the lifelong learning.

Factors that can deliver strategies for optimizing the learning process

Communication/Dealing with information

11. The brain always connects new information with existing knowledge.
12. Natural contexts: the information given by the teacher should be based on concrete examples, real life problems, concrete problem solving.
13. Novelty: the brain always looks out for and speedily observes unknown (new) issues.
14. Personal relevance: if the information has a personal relevance for the student, he or she will learn more efficiently.
15. Solid patterns: the brain is always searching for solid patterns based on which it can predict results and consequences.

Factors that can deliver strategies for optimizing the learning process

Didactic choices/learning strategies

16. Feedback: feedback is central for the learning process.
17. Active learning: the student should he/herself construct his/her knowledge based on his/her own activity.
18. Many sensory channels: the more sensory channels used, the better the knowledge is stored.
19. Diversity of working modes: the more methods and media used, the better the knowledge is stored.
20. Motion: Using the body while learning and in general supports the brain and the learning process.
21. Repetition: repetition and clarification of central concepts/matters strengthen the intake and the processing of new information.
22. Basic bodily issues for the student (a): sleep is important for the learning process.
23. Basic bodily issues for the student (b): a balanced energy intake is important for the learning process.

Factors of basic importance for learning

24. Attention

Attention and motivation interact and are the core prerequisites for knowledge construction

25. Motivation

26. Knowledge construction/memory work

Within the last 10-15 years, research in the brain and learning has provided us with much knowledge on how the brain learns. However, keys to utilize this knowledge have only been developed to a limited extent, and those present are not easily manageable and, furthermore, focus exclusively on K-12.

On this poster, a model developed on the basis of the existing research (not least as gathered by Tracey Tokuhama (Espinosa 2011) is presented. The model comprises 26 factors important to HE-education and is named the **APL** model, **A** standing for approach, **P** for practice and **L** for learning. It addresses both teaching and learning, instructors and students, that is. Factors not supported by the research in the brain and learning are not included.

Approach covers one's basal attitude/mindset to teaching and learning (e.g. all brains are different, the plasticity of the brain).

Practice covers teaching/learning practice and is divided into three main categories: behavior (e.g. considering the role the emotions, self-efficacy, meta reflection in teaching and learning), communication/information processing (e.g. the fact that all new knowledge is processed on the basis of existing knowledge, the importance of relevance and creating solid patterns), and didactic choices/learning strategies (e.g. feedback, active learning).

Learning covers knowledge construction/memory work based on the interaction of motivation and attention. All elements of A and P influence L.

Some of the techniques and strategies presented will be well known, but are now based on sound research - and we can go a step further than 'It works' now being able to explain why. Other techniques and strategies, on the other hand, will be new.

This brochure is based on the presenter's book 'Hjernen og lœring' (The Brain and Learning), published in March 2016.

Tokuhama-Espinosa, T. (2011). *Mind, Brain, and Education.* New York: W.W. Norton.