

Twelve key thinking processes

Key thinking processes are fundamental thinking processes that are applied to every issue. Because every choice, conscious or unconscious, is preceded by a thinking process.

The word 'key' is crucial in the term 'key thinking processes'. It points to what Hyerle (2009) calls 'fundamental cognitive skills'. These are **skills** that are used **in a goal-oriented way in more complex thinking process like** critical thinking, creative thinking and analysis. Every more complex thinking process consists of a combination of key thinking processes as a function of the desired end result.

The end result could be a critical analysis, a brainstorm, a comparative study or a decision. The strategic use of thinking processes keeps us from impulsive or routine choices.

Which thinking processes we use depends on the goal we want to achieve (Runco;1994). How we go through the processes is different for each individual and determines the result. The effective and goal oriented use of thinking processes requires a learning process. The use of visual thinking tools or thinking routines can offer an interesting stepping stone.

Schools can set, as a goal, any complex thinking process they wish to pay attention to when thinking about societal issues. These could be systems thinking, critical thinking, creative thinking, or any other complex thinking process.

Societal issues, because of their great complexity, provide an excellent **context** for activating and developing these **key learning processes**. It is important that the school pays 'explicit' attention to them (Perkins, 1992). By 'explicit' (Perkins, 1992), we mean that the school visibly valorizes and thus names them, and repeatedly evaluates their use.

For example, by **consciously reflecting** on what the thinking processes have contributed to the final result. But we also learn from each other by sharing what goes on in our minds when we are confronted with a societal issue, and hearing from others about what goes on in their minds.

For the teacher, it is a good way of gaining a better understanding of the students' thinking and of how to relate learning activities to that thinking.

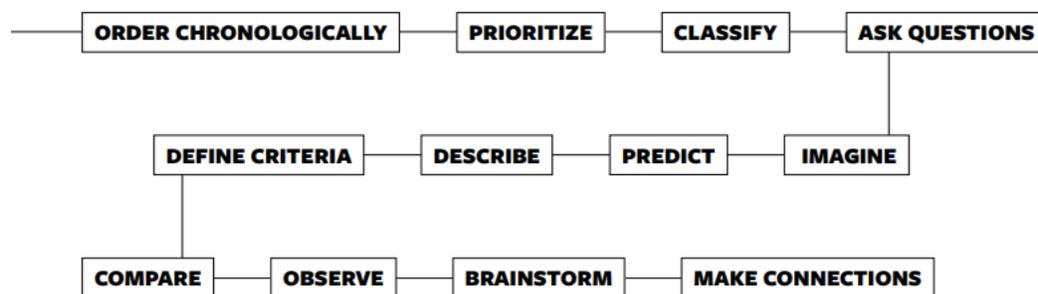
By making key thinking processes explicit, however, we gain insight not only into a **students' capability** of applying thinking processes. Expliciting thinking processes also shows students' **motivation** and **sensitivity** in detecting situations in which it may be useful to ask questions or make connections.

And finally, explicitly going through thinking processes enables students to experience **knowledge as something relevant**, something they can do something with.

Students learn by doing; by applying knowledge to achieve a goal. They learn by thinking (Perkins, 1995).

There are many different **taxonomies** for classifying thinking processes. Djapo chooses to follow the vision of David Hyerle and to make thinking processes as specific as possible. Djapo selected 12, key thinking processes, based on cognitive science research, specifically Upton and Hyerle's (2009) research on Thinking Maps. We have expanded the 8 fundamental thinking processes of the Thinking Maps with a number of thinking processes that occur particularly in the ESD research of Edubron and the University of Ghent.

These key thinking processes are fundamental thinking processes that are invoked in relation to every issue in a well-defined combination or order.



This text is an excerpt from 'The school as a place for practice. How Education for Sustainable Development contributes to quality education' written and edited by Djapo. Read the complete publication [here](#).

Bibliography

Djapo. 2022. *The school as a place for practice. How Education for Sustainable Development contributes to quality education*, Leuven: Djapo.

Hyerle, D. 2009. *Visual tools for transforming information into knowledge*, Thousand Oaks: Corwin Press.

Perkins, D. 1986. *Knowledge as Design*. New York & London: Routledge.

Perkins, D. 1992. *Smart Schools*, New York: The Free Press.

Perkins, D. Jay, E., Tishman, S. 1993. 'Beyond abilities: a dispositional theory of thinking', in *Merill-Palmer Quarterly*, 39(1). pp.1-21.

Perkins, D. 2001. 'The social side of thinking', in A. Costa (Red.), *Developing minds: A resource book for teaching thinking*. Virginia: ASCD. pp. 158-163.

Perkins, D., Tishman, S., Ritchhart, R., Donis, K., & Andrade, A. 2000. 'Intelligence in the wild: A dispositional view of intellectual traits', in *Educational Psychology Review*, 12(3), pp. 269-293.

Runco, M. A. 1994. *Problem finding, problem solving, and creativity*. New Jersey: Ablex Publishing Corporation.