

Mind maps

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What are mind maps?

- “a form of an outline with ideas and pictures radiating out from a central concept” with hierarchies and associations that stemming from a central image in a free-flowing, yet organised and coherent manner” (Budd p.36).
- active learning tools which aim to engage students in “meaningful learning activities such as dialogue, debate, writing, and problem solving, as well as higher-order thinking, e.g. analysis, synthesis, evaluation” (Willis & Miertschin 2006, p. 266).



What advantage do they have in the classroom?

- alternative to “chalk and talk”
- a semantic organisation tool that helps learners analyse and organise “what they know and what they are learning”
- many uses pertinent to learning: “developing understanding, problem solving, conveying information, and assessment of student understanding”
- encourages learners to express existing cognitive structures and build on those by integrating new knowledge.



Advantages cont.

- helps teachers connect with **diverse learning styles**
- research into memory and learning stresses the **value of associations**, which is precisely what mind maps do.
- provide a view of individual understanding and “an opportunity to assist with the analysis of complex processes and can play a role in knowledge translation” (Wheeldon & Faubert, p. 71).



Educational theory behind mind maps

- Mind maps support the “theory of inquiry” proposed by Dewey and Schon’s notion of “reflective practices” in which purposeful thinking and inquiry turns experiences into deep and meaningful learning and provides a framework for the development of **critical thinking** (Zipp et al., 2011, p. 59).
- may also support the conceptual framework of **constructivist learning theory**



Evidence of impact from the tertiary sector

- ambiguous evidence on the effectiveness to promote critical thinking in education
- some research findings (e.g. in nursing) show that mind maps facilitate meaningful learning as a process in which a student links new information with old, or improved critical thinking



OPEDUCA mind maps

Water

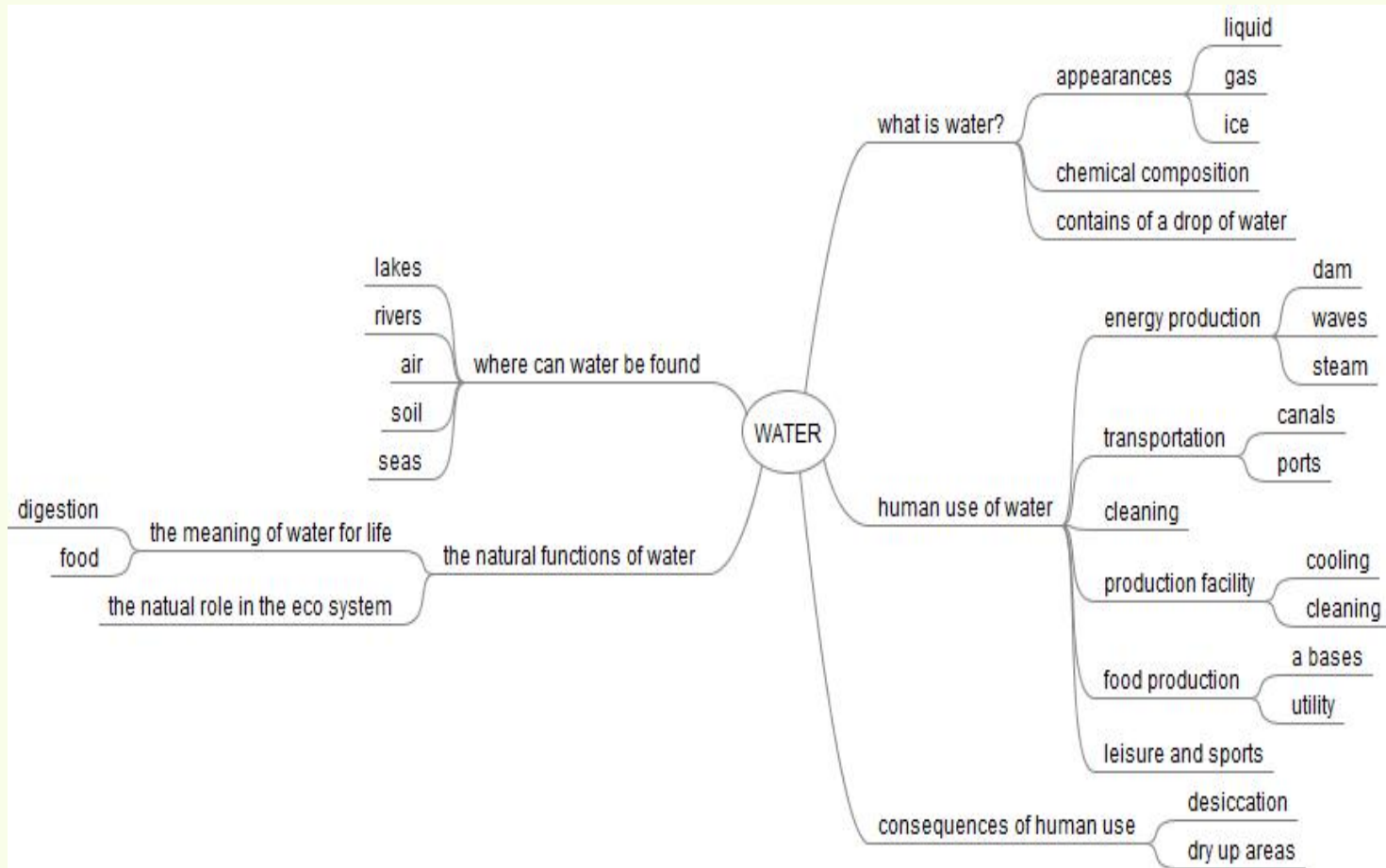
Energy

Food

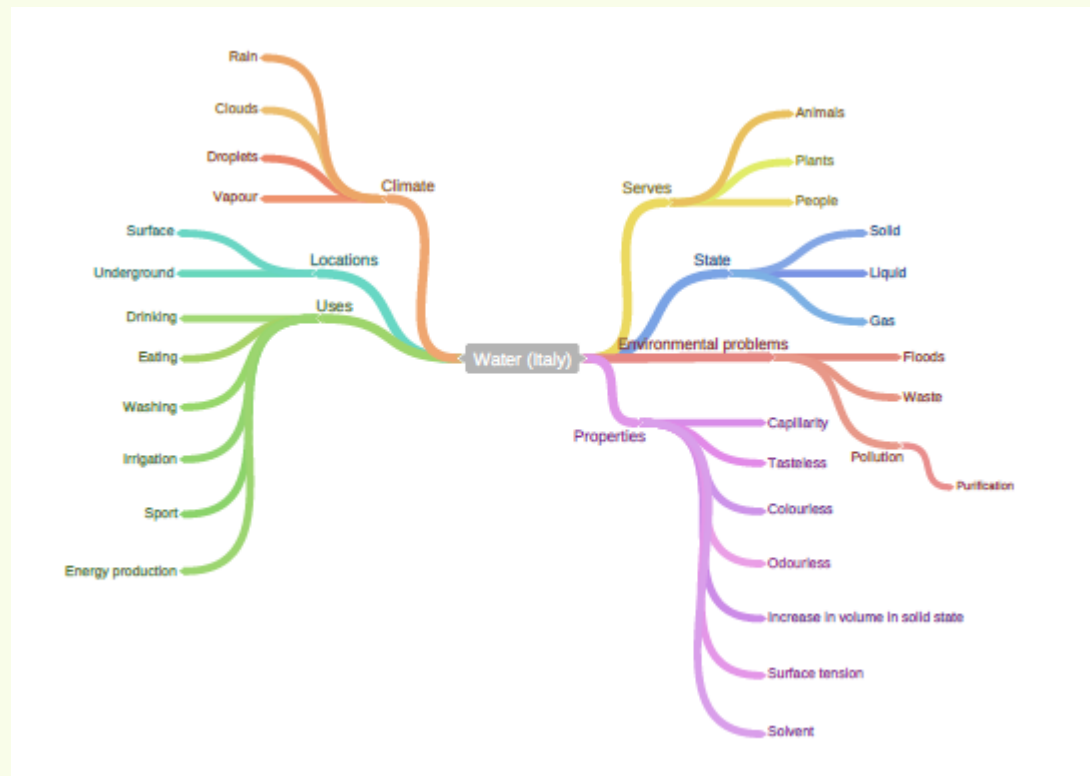
Buildings



Dutch water mind map



Italian mind map (water)



Czech Water Mind Map



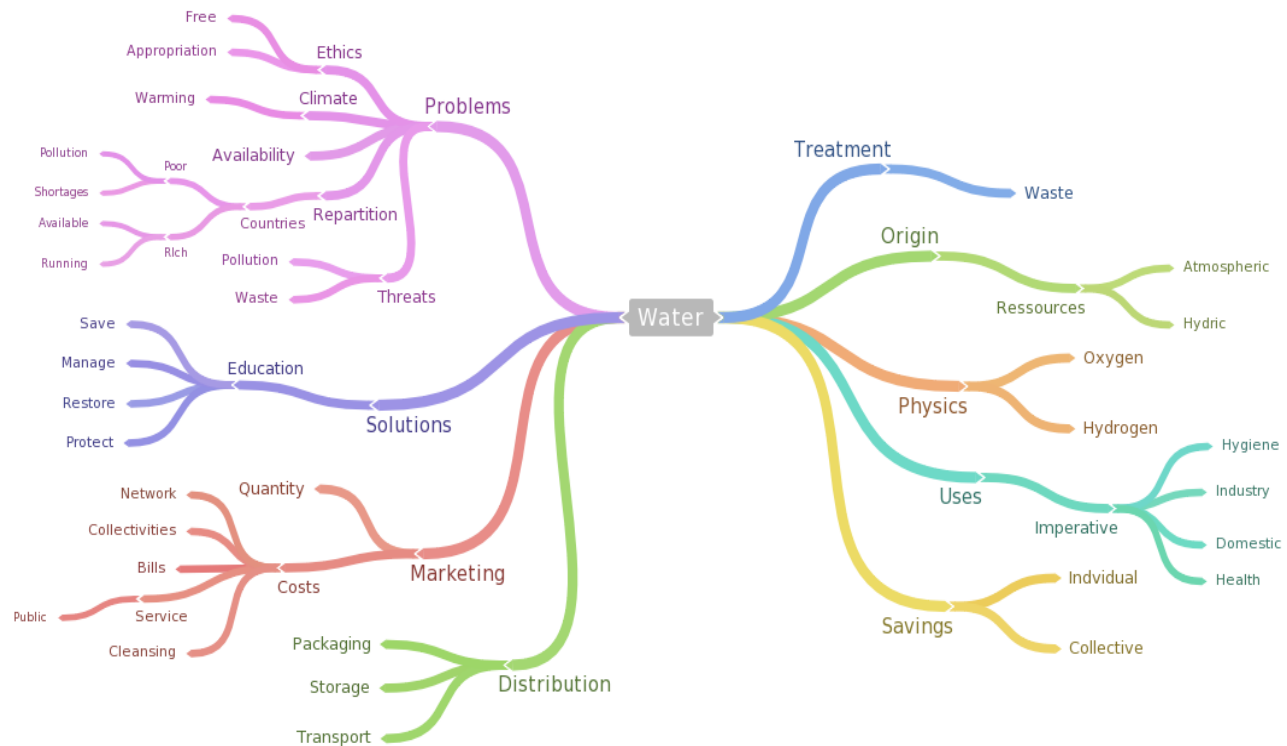
Czech mind mapping schools

- Mixture of junior secondary & primary school pupils from:
 - Schola Humanitas
 - Prokop Holý Primary School in Louny
 - Meziboří Primary School
 - Údlice Primary School.



Synthesis of French water mind maps

coggle



Synthesis of water mind maps: potential reference map

coggle



Points of interest

- Similarities:
 - Problems/danger
 - Waste/treatment
 - Chemistry/physics
 - Origin/occurrence in nature



Point of interest cont.

- Differences:

French	Czech
Solutions	Energy
Marketing	Weather
Distribution	Climate change
Savings	Life
	The human body
	States



What is the cause of these differences?

- What influences the choices and priorities students from different countries give to mind map themes and sub-topics?
 - Teaching methodology?
 - Age of students/school year?
 - Social-cultural environment?
 - Physical environment?



How could OPEDUCA gain leverage from future mind mapping?

- Common methodology
- Creation and application of sustainability reference maps – syntheses & expert input
- Measurement of baseline extant knowledge
- Repeated use of mind mapping exercises – before and after maps
- Surveys of student responses to mind mapping



References

- Budd, J. W. (2004). Mind maps as classroom exercises. *The Journal of Economic Education*, 35(1), 35-46.
- Chiou, C. C. (2008). The effect of concept mapping on students' learning achievements and interests. *Innovations in Education and Teaching International*, 45(4), 375-387.
- Eppler, M. J. (2006). A comparison between concept maps, mind maps, conceptual diagrams, and visual metaphors as complementary tools for knowledge construction and sharing. *Information visualization*, 5(3), 202-210.
- Immonen-Orpana, P., & Åhlberg, M. (2010). Collaborative Learning by Developing (LbD) using concept maps and Vee diagrams. *Handbook of research on collaborative learning using concept mapping*, 215-235.
- Wheeldon, J. P., & Faubert, J. (2009). Framing experience: concept maps, mind maps, and data collection in qualitative research. *International Journal of Qualitative Methods*, 8(3), 52-67.
- Willis, C. L., & Miertschin, S. L. (2006). Mind maps as active learning tools. *Journal of Computing Sciences in Colleges*, 21(4), 266-272.
- Zipp, G. P., Maher, C., & D'Antoni, A. V. (2011). Mind Maps: Useful schematic tool for organizing and integrating concepts of complex patient care in the clinic and classroom. *Journal of College Teaching & Learning (TLC)*, 6(2).

