



Mental Maps: A new instrument for teaching-learning-evaluation of engineering students

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The use of interactive mind maps for teaching-learning-evaluation of postgraduate students is still not very common in Geosciences. Notwithstanding, these maps allow students to organize the huge volumes of information and data they are faced with (www.spinscape.com) for efficient research project elaboration and for understanding of basic anzatz and conjectures (Singer, 2009). The elaboration of mind maps is introduced as a principle teaching-learning-evaluation instrument (Cruza and Fierros, 2006) in my Research Methodology Seminar. Each student should to construct three types of multiscale mind maps before to write the formal proposal (Curiel and Radvansky, 2004; Zimmer, 2004). The main goal is to show how useful is to manage the physical, mathematical and linguistic information on the same structured way (Montibeller and Belton, 2009; Chu et al., 2009). The mental representation of the spatially and time organized physical world (physical map) is combined with the design of hierarchical tree of mathematical models used to describe it in mathematical terms (the map composed only by mathematical symbols), visualizing this tree branches by corresponding images inside the third map consisting on images. This three-faced representation of each research project helps the participant to perceive the complex nature of studied systems and visualize their features of universality and scale invariance. The map's elaboration is considered to be finished when any student of other specialties become able to present it in acceptable scientific way. Some examples of recent mental maps elaborated by the master degree students of Queretaro University, Mexico will be presented and discussed. Based on my experience I recommend this education technique in order to pass from sustainable engineer teaching to educate the engineers of Sustainability.

References

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