

**The role of misconceptions in the development of a reliable geological knowledge. A project on alternative ideas of Earth Science Bachelor students**

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The pre-existing knowledge that Earth Science Bachelor students have when they are starting their University studies, is influential on the scientific knowledge they have achieved when they graduate. This project examines the alternative ideas that first, second and third year Earth Science Bachelor students have on basic geological topics, and if it influences the knowledge that they develop. These topics include; the definition of density, Earth's magnetic and gravity field, heat sources inside the Earth, location and movement of tectonic plates, volcanic and earthquake's distribution on surface, isostasy, weathering and erosion, earth's past and future, rock formation and the relevant age of continental and oceanic rocks. In order to process this, students' alternative ideas were assessed with a 20-item multiple choice questionnaire, which was formed online and delivered to all the **Earth Science bachelor students at Uppsala University** (2015). The questions were selected from the Geoscience Concept Inventory (GCI) developed by *Libarkin & Anderson, 2006*. The questionnaire was with SPSS software and students' scores were calculated. One way ANOVA was performed in order to determine statistically significant difference between students' scores and year of studies. The expected outcome was that third year students would have higher GCI scores/level of conceptual understanding, compared to the first and second year students, and that first year students would have the lowest. The results revealed the presence of alternative ideas to all of the students, and even that the year of studies is a factor that affects the GCI scores, even though the students' final scores are relatively low for both second and third year students. The Earth science knowledge is not acquired by the accumulation of relevant information through the years of studies, but the existence of alternative ideas imply an resistance of or obstacle in learning science.

**References:**

Libarkin, J. C. & Anderson, S.W. 2006. Development of the geoscience concept inventory. *Proceedings of the National STEM Assessment Conference, Washington DC*, pp.148-158.