Geology in science teacher education in Norway: introducing a textbook integrating geological knowledge and geology education

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Geology has become a stronger component in the latest national science curriculum for primary and lower secondary school in Norway, particularly in secondary school where students should be able to 'use the theory of plate tectonics to explain the evolution of the Earth over time and provide examples of observations that support the theory' (NDET, 2019). Despite its presence in the national science curriculum, geology is a minor part of science teacher education. To our knowledge, geology is nearly neglected in science teacher education and is often taught by professors from other scientific disciplines, such as Physics or Biology. Hence, more support for student teachers is needed to ensure that they have the necessary content knowledge in geology and how to teach geology. Therefore, we embarked on a project to write a textbook for science teacher education, with the working title 'Å undervise om ei jord i endring: Geologididaktikk i og utenfor klasserommet' (translated to: Teaching about a changing Earth: geology education in the classroom and outdoors'.

Each chapter integrates geology and geology education. This means that the book not only provides a description of geological knowledge, but also how to teach it. We have chosen to focus on the topics and concepts that are included in the curriculum goals in the national science curriculum, which include plate tectonics, observations that support the theory of plate tectonics, how the theory of plate tectonics developed in the scientific community, as well as more specific concepts such as the geological cycle and landscapes formed by plate tectonics, ice, and water. Finally, we reflect on the role of geology in education for sustainability, as sustainable development is one of three interdisciplinary topics in the Norwegian curriculum. For each topic and concept, we also provide research-based suggestions for how it can be taught in the science classroom, for instance by using analogies, digital maps, and practices such as argumentation based on evidence. In this presentation, we describe our work in progress with this textbook and provide examples of classroom activities that integrates geological content knowledge and research on geology education.

References

NDET, 2019: Curriculum for national science. Norwegian Directorate for Education and Training: Oslo. Retrived from: https://www.udir.no/lk20/nat01-04/kompetansemaal-og-vurdering/kv78