RECENT DISSERTATIONS

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Assessing Scientific Literacy as Participation in Civic Practices: Affordances and constraints for developing a practice for authentic classroom assessment of argumentation, source critique and decision-making

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Abstract

This thesis takes a departure from a view of scientific literacy as situated in participation in civic practices. Due to the complexity of transferring knowledge, it is problematic to assume that people who can explain scientific theories will automatically apply those theories in life or that knowledge will influence those people's behaviour. Participation could be seen as situated in practices and thus becomes something specific within those practices. For instance, shopping for groceries for the family goes beyond reflecting critically and ethically on health and environment since it involves considering the family economy and the personal tastes of the family members. The thesis describes a praxis development research study where I, in cooperation with teachers, have designed interventions of assessments in lower secondary science classrooms. In the research study I use the theory of Community of Practice and Expansive Learning to study affordances and constraints for assessing communication, source critique and decision-making in the science classroom. The affordances and constraints for students' participation in assessments are studied through using a socio-political debate as an assessment tool. The affordances and constraints for communicating assessment are studied through peer assessments of experimental design. The affordances and constraints for teachers to expand their assessment repertoire are studied through assessment moderation meetings. Finally, the affordances and constraints for designing authentic assessments of scientific literacy are studied through a review of different research studies' use of authenticity in science education. The studies show that tensions emerge between purposes of practices outside the classroom and practices inside the classroom that students negotiated when participating in the assessments. Discussion groups were influential on students' decisions on how to use feedback. Feedback that was not used to amend the designs was still used to discuss what should count as quality of experiments. Teachers used the moderation meetings to refine their assessments and teaching. However, conflicting views of scientific literacy as either propositional or procedural knowledge were challenging to overcome. Different publications in science education research emphasised personal or cultural aspects of authenticity. The different uses of authenticity have implications for authentic assessments, regarding the affordances and constraints for how to reify quality from external practices and through students' engagement in practices. The results of the studies point to gains of focussing the assessment on how students negotiate participation in different civic practices. However, this approach to assessment puts different demands on assessment design than assessments in which students' participation is compared with predefined ideals for performance.

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