Students as partners in course development – a pilot
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ABSTRACT
In this iEarth-funded project, students and staff collectively revised the first year geoscience course GEO1110 at Oslo University. The development work took place in the semester leading up to, and during the time the course was given. Of the five students in the development group, two were also students in the course. The latter two took on the added responsibility as course representatives; this allowed for immediate changes of the course in response to student feedback. The course development had strong positive influence on course evaluations. Students and staff who participated in the course development also report positive outcomes. Our experience strongly supports student and staff co-creation for course development. It also highlights positive self-efficacy, metacognitive and motivational effects of co-creation.

INTRODUCTION AND AIMS
The suddenly digital 2nd semester geoscience course GEO1110 received poor student evaluations in 2020 (Fig. 1). The students requested a meeting; the course failed to build on students previous knowledge, lacked coherence across modules and did not communicate clearly what the students were supposed to learn. The students’ critique echoed some of the comments in one internal and one external course evaluation from 2019 (Gasser and Linge 2019; Thomassen 2019).

In response to the students’ concerns, staff and students conceived of the course development project described below. For the Department of Geosciences, Oslo University, it was also a pilot to try out a novel way to engage and involve students in improving teaching and learning in their courses, and support student and staff co-creation.

Inspiration for the organization of the project came from work on co-creation (collaboration between staff and students) by Susanne Barrineau at Uppsala University (Barrineau et al. 2019) and Cathrine Bovill at University of Edinburgh (Bovill 2020a). One tenet of co-creation is that students bring valuable expertise to the courses they take. They are experts on what prior knowledge and skills they bring from high school and university courses they have taken, what they find engaging and interesting, what concepts and methods they find particularly challenging, the constraints from parallel courses and jobs they may have besides their university studies, to name a few. A second tenet is that in order for students to develop generic skills needed in society such as speaking up at meetings, taking initiatives and responsibility individually and in teams, and taking charge of their own learning to become lifelong learners, the students must practice these skills rather than read about them in books. Student-staff co-creation offers a way of developing all of these skills.

The goal set for students and staff participating in the co-creation project was to improve teaching and learning in the course GEO1110. However, the goal of the pilot project itself was to explore the potential of staff and student co-creation. Developing new courses and revising old ones is typically the responsibility of university teachers. Can student and staff co-creation strengthen the student voice in course development, from what is taught, how and when it is taught, to how it is evaluated through different types of projects, exams etc.? How can student and staff co-creation be organised? What are the effects on the participants when students and staff co-create course development? These were questions that we hoped this pilot project could help answer.
IMPLEMENTATION

In the discussions following the course evaluation meeting in 2020, students and staff came up with the idea of a co-creation project. We submitted an application for funding for student salaries (32h/participant) from iEarth to work on course development with staff in advance of, and during, the 2021 course. Two students joined from the 2020 cohort, two students volunteered from the 2021 cohort, and two students already active in the iEarth student chapter joined to represent the 2019 cohort. One student from the 2019 cohort departed as exchange student and could not take part in the course development. Staff were represented by Mattias Lundmark (course responsible) and Karianne L. Staalesen (course teacher). Kristian Bakken (administration) participated to give input on and address potential administrative challenges. Two teaching assistants in the course were invited to some meetings to discuss practical work with minerals and rocks, and with Geographical Information Systems (GIS). To facilitate information flow between the co-creation group and the students taking the course, the co-creation group decided to introduce course representatives in GEO1110. The two members of the co-creation project taking the course in 2021 took on this added role.

To talk education development, staff and students need a shared language. In the first two meetings with students and staff we therefore looked at excerpts from Ch. 1 and 2 in Biggs and Tang (2011), and the rationale behind backwards course design. In the second meeting we mainly discussed the old course design and student feedback from previous years, and two course evaluations (Gasser and Linge 2019; Thomassen 2019) to understand challenges and possibilities.

Students can contribute in many different ways to co-creation, and we discussed some of these in general terms based on examples from e.g. Barrineau et al. (2019). However, the students had the final word in what they worked on. Since the students had limited time, they decided that rather than develop new material themselves, they would concentrate on giving suggestions for course improvements to the staff, who in turn implemented the revisions.

Including the student perspective in the planning phase ahead of the course start gave rise to numerous changes to the course. While the course was under way, much of the feedback came directly from the two course representatives to staff. The students in the co-creation project also took charge of the mid-term evaluation, which they designed around

![Fig. 1. Timeline of the co-creation project.](image1)

![Fig. 2. Three activities in course development (Barrineau et al. 2019), and examples of contributions from students in the co-creation project.](image2)
small group discussions with the students taking the course. The end-of-course evaluation was done jointly with staff.

METHODS AND RESULTS
Data from the course were gathered through a mid-term and an end-of-course evaluation. To evaluate the co-creation project, the participating students and teachers were asked to write short reflection notes, and a final meeting to discuss and evaluate the project was arranged in August 2021.

Prior to the course start, the students in the co-creation project helped redesign teaching activities in response to digital teaching requirements during Covid (e.g. extended the use of pre-lecture assignments and breakout rooms during zoom sessions), revised and initiated development of supporting materials (e.g. an introductory video on chemistry and a compendium for geological maps), reviewed the course for overlap with the preceding geoscience course, GEO1100, and for collisions with parallel subjects at other departments, and changed parts of the exam form (15% of the final grade was transferred from a multiple-choice exam to a field report).

During the course, the course representatives were very effective in gathering and interpreting student feedback, and suggesting improvements. This led to numerous small adjustments of the course underway, from better use of the learning platform Canvas to adjusting the schedule to better fit the students’ needs. This was very appreciated by the students taking the course. The students in the co-creation project also initiated two extracurricular activities to support student learning (a helpdesk for using GIS software in relation to a course project and a seminar on report writing). Interestingly, and unexpectedly, the students taking the course followed this up by organizing an extra field day to complement the obligatory fieldwork, and invited interested geophysics students to join them. We suspect that this was triggered by the many examples of student led initiatives during the semester, several of which were provided by the students in the co-creation group. In addition, the students planned and carried out the mid-term course evaluation, and parts of the end-of-course evaluation.

In all, the co-creation group met five times in advance of and during the course, the students in the group had two additional meetings, and after the course we all gathered for a final evaluation meeting. The course representatives actively solicited student feedback during the course, and provided information and suggestions to the co-creation group on an ongoing basis.

DISCUSSION AND CONCLUSIONS
In this pilot, we started the co-creation project with ca. 3h on teaching and learning theory. We believe that this greatly facilitated the work that followed. The theory provided direction and guidance when we discussed different potential changes to the course. It also provided a common language to discuss teaching and learning. In hindsight, students and staff agree that introducing the theme through a more student active approach than lecturing and reading material would have been preferable.

Following the theory heavy introduction, the students in the co-creation group chose to contribute to all three aspects of course development: planning, facilitation and evaluation (Fig. 2; Barrineau et al. 2019). Many of the course improvements would not have been implemented if not for the student voice. In some cases, this reflects that students have a different perspective than staff on the challenges to learning, having recent, first-hand experience of them. In other cases, it may reflect that students tend to have more experience with modern forms of teaching than staff. The students take courses in various subjects at different departments, and even different universities, and take advantage of these experiences in the course development. This was particularly evident in our discussions of adoptions to digital teaching, where the students were more experienced than staff.
Including students from three cohorts in the course development contributed greatly to our discussions. The students who were further along in the bachelor program had both gained perspective on potential uses of the material taught in GEO1110, and had more experiences of teaching to draw from to suggest improvements. The students following the course, on the other hand, knew exactly what the students had already been working on in the previous and parallel courses, and could gather feedback from the course continuously. Having administrative support at hand during the meetings allowed us to quickly address some practical issues the students raised, and stopped us from pursuing impractical solutions.

As a result of the co-creation project, the course evaluations for GEO1110 improved markedly. In particular, comments such as “Good coherence, it’s obvious that [this course] builds on the previous one” (mid-way course evaluation), testify to the impact of the course development. Our experiences therefore support that co-creation is an effective way of bringing student expertise to bear on challenges in a course.

In addition, reflection notes and discussions suggest that the participants in the co-creation group also changed their views on staff and student roles, giving greater recognition to the value of student input. The enthusiasm for the co-creation was manifest in comments such as: “If the students continue to help with improving GEO1110, it could one day become one of the best geology introductory courses in the world” . The change in perspective was also expressed by another student: “before this I didn’t realize that students could change the courses”. This suggests that the co-creation strengthened student self-efficacy (the belief in one’s ability to affect change). Several students also reported changes in their approach to their own learning, i.e., effects on metacognition (cf. Mercer-Mapstone et al. 2017). Two students specifically comment on this in their reflection notes: “This semester I have tried to focus more on deep learning when I study.”, and “Moreover, I was able to reflect more about if my current study habits support higher order thinking.”. Both students and teachers report that the co-creation increased motivation to work on course development. The positive effects on self-efficacy, metacognition and motivation match findings in previous co-creation studies (e.g. Mercer-Mapstone et al. 2017, and references therein).

To take full advantage of the strengths and possibilities of co-creation, i.e., not only developing a better course for all students, but also the effects on self-efficacy, metacognition and motivation for the participants, we are convinced that the involvement of a few students in a one off co-creation effort needs to be turned into continuous co-creation involving all interested students (cf. Bovill 2020b).

For co-creation to become more widespread, both students and teachers need to be motivated to initiate and pursue projects together. Motivation can be viewed as the product of perceiving value in the goal, and the belief that the goal is attainable at a reasonable effort (Wigfield and Eccles 2000). Part of the iEarth brief is to share experiences and provide support to make it easier for anyone interested in trying out a similar project. So far, the co-creation group has presented the project at the ISSOTL 2021 conference (Andersen et al. 2021), at the iEarth Digital Learning Forum (spring 2021), and at the Geolearning Forum (2021). The present report is also part of this dissemination effort.

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REFERENCES


