What are the future challenges of higher education geoscience in Norway?

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iEarth will promote an engaging, innovative learning environment to educate the next generation of Earth scientists, who must be skilled enough to tackle the twenty-first century’s societal challenges through research-based student-active learning and reality-based practicals at a national level with strong international collaboration.

› Creating a national competence centre for earth science education
› Developing a generic approach to cross-disciplinary earth science education within critical fields of societal relevance: geohazards, resources, energy, environment, climate
› Establishing a coherent system of evaluation to foster teaching excellence and identify best practice to disseminate worldwide
Baseline survey

Online questionnaire for researchers, teachers, administrative and technical staff and students

The future of geoscience, teaching, collaboration, feedback and contact with industry

The baseline questionnaire includes 45 questions for teachers
To what extent do you believe the following skills will be important for geoscientists in the future?

- Quantitative competence (ability to interpret data)
- Scientific writing and reading competence (literacy)
- Working in interdisciplinary teams
- Collaborative skills
- Theoretical understanding
- Critical thinking
- Modelling/computing skills
- Laboratory skills
- Fieldwork skills

Staff n=256
To what extent do you believe the following skills will be important for geoscientists in the future?

Students n=210

- Working with large data sets (ability to interpret data)
- Scientific writing and reading competence (literacy)
- Working in teams
- Collaborative skills
- Theoretical understanding
- Critical thinking
- Modelling/computing skills
- Laboratory skills
- Fieldwork skills
What skills do the students aquire in the programme?

Staff n=256

- Quantitative competence (ability to interpret data...)
- Scientific writing and reading competence (literacy)
- Working in interdisciplinary teams
- Collaborative skills
- Theoretical understanding
- Critical thinking
- Modelling/computing skills
- Laboratory skills
- Fieldwork skills

0 50 100 150 200 250 300

1 2 3 4 5 6 7 not applicable
What skills do you acquire in the programme?

Students n=210

- Presentation skills (oral)
- Working with large data sets (ability to interpret…)
- Scientific writing and reading competence…
- Working in teams
- Collaborative skills
- Theoretical understanding
- Critical thinking
- Modelling/computing skills
- Laboratory skills
- Fieldwork skills

0 50 100 150 200 250

1 2 3 4 5 6 7 I don't know
Do we prepare our students for the future?

Students n=210

Staff n=256
Creating change as a cultural challenge...

The *departmental culture governs* the behaviour of staff and students through norms, tacit knowledge, and implied notions about how research and teaching is performed.

Creating change will therefore include a change in *teaching culture*.

*From individual teachers to collaborating units*.

Lee, 2007; Merton, 1973; Gerholm, 1990; Brew, 2001; Ulriksen, 2009
Operationalization of teaching culture

- Discussing teaching
- Receiving feedback
- Collegial support
- Teacher efficacy
Question T19: How often do you and your colleagues discuss the following topics related to teaching?

<table>
<thead>
<tr>
<th></th>
<th>iEarth Teachers n=96</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sometimes to Very often</td>
</tr>
<tr>
<td>The academic content</td>
<td>75%</td>
</tr>
<tr>
<td>Instruction and assessment methods</td>
<td>80%</td>
</tr>
<tr>
<td>Practical organization</td>
<td>80%</td>
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</tbody>
</table>
Question T19: How often do you and your colleagues discuss the following topics related to teaching?
## Collegial support in teaching development

**Question T20**: Please indicate to what extent you agree with the following statements

<table>
<thead>
<tr>
<th>iEarth Teachers N= 96</th>
<th>Agree to Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My colleagues are open for new ideas with regards to teaching</td>
<td>31%</td>
</tr>
<tr>
<td>My colleagues support me when I want to develop my teaching</td>
<td>38%</td>
</tr>
<tr>
<td>My colleagues understand the problems I experience with regards to teaching</td>
<td>42%</td>
</tr>
</tbody>
</table>
Receiving feedback on your teaching

Question T25: How often do you receive feedback on your teaching from the following groups?

![Bar chart showing feedback received from Academic staff, with 35% receiving feedback rarely.](chart.png)
Receiving feedback on your teaching

Question T25: How often do you receive feedback on your teaching from the following groups?

iEarth Teachers N= 96

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1</td>
</tr>
<tr>
<td>Very rarely</td>
<td>2</td>
</tr>
<tr>
<td>Rarely</td>
<td>3</td>
</tr>
<tr>
<td>Sometimes</td>
<td>4</td>
</tr>
<tr>
<td>Often</td>
<td>5</td>
</tr>
<tr>
<td>Very often</td>
<td>6</td>
</tr>
<tr>
<td>Continuously</td>
<td>7</td>
</tr>
<tr>
<td>Not applicable</td>
<td>8</td>
</tr>
</tbody>
</table>

44%
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