**Changing the Teaching Culture in a Large Research Oriented Department**

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*“We’ve hit it out of the park with Earth and Ocean Sciences, one of seven departments that are part of the university-funded initiative. I will declare them to be a success,”* UBC’s Dean of Science, in *Science*, 2013.

*“Without exception, the more the Department as a whole has been involved and seen this as a general Departmental priority, the more successful and dramatic have been the improvements in teaching.”* in *Change*, 2010.

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### Setting and resources

**What conditions enabled cultural change?**

**Contributing Factors**

- **Consistent leadership:** UBC, Fac. of Sci., CWSEI, Dep’t head, Project director
- **CWSEI:** Funding, oversight, expertise, support, training, research guidance
- **Framework:** use Research Based Instructional Strategies (RBIS)
- **Focus:** Faculty and teaching assistants first, courses second
- **Emphasis:** "Visible thinking”, student centric, evidence oriented.
- **Engage grad:** AND undergraduate students in education development.

**CWSEI Model for change:**

- **Use, Generate, Disseminate** research on learning, & avoid re-invention.
- **Sustainability:** Changes to best practices must persist into the future.
- **Time / resources** for scholarly practice. Buyout choice: teaching or 1/m exp.
- **Community development:** Regular STLF meetings, consult for research faculty, use Solid literature, bring in expert visitors, run events and workshops, publish our research and presentations, collaborate with STLFs and other colleagues –

**Science Teaching and Learning Fellowships (STLFs):**

- **Background:** Geosci. PhD or MSc with Sci. Ed. expertise & interests
- **Buildup of staff** and expertise over time. **Then** long term consistency of personnel.
- **Facilitate:** communication, consensus building, professional development of RBIS
- **Collaborate with faculty** to develop materials and teaching approaches
- **Serve as a local resource for faculty**
- **Collect / distill / communicate** data to support and guide faculty efforts
- **Ensure sustainability by archiving and disseminating**
- **Consulting model:** Work with instructors to enhance education, on an-as-needed basis.
- Support experienced **TA**s to refine needs and develop activities (2-5 per term)
- STLF supervises TA, and liaises with instructor.
- **Conduct & publish:** Discipline Based Education Research (DBER)

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### Accomplishments

**What was done? What was produced?**

**The Aim:** to dramatically improve undergraduate education in our Department

- 23 courses underwent 2-3 year "transformations".
- ~15 other courses improved using the consulting model.
- ~35 instructors initially incorporated RBIS in their teaching. ~80% retain RBIS.
- 13 instructors supported for 1 course; 14 for 2 courses; 5 for 3 courses; 3 for 4.
- Two stage exams introduced - figure right 
- Faculty continue improving and transfer RBIS to other courses.
- Increase active learning in classes & using technology.
- Peer-to-peer and group interaction.
- Skills development and critical thinking are emphasized.
- Formative & summative assessments improved.
- Increased opportunities for experts to engage with students.

**Table showing project flow over 7 years:**

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<td>21</td>
<td>10</td>
<td>12</td>
<td>20</td>
<td>10</td>
<td>24</td>
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<td>Instructors engaged</td>
<td>3</td>
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<td>3</td>
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<td>5</td>
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<tr>
<td>Total number of people involved</td>
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<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
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**Course transformations and project timelines**

<table>
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<th>2010</th>
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<td>Transform 15/15</td>
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<td>Transform 15/15</td>
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### Evidence of change

**Demonstrable changes in geoscience education & teaching culture**

**Teaching Practices Survey: 2007 and 2013**

- Instructors self-reported for each course they taught:
- **Raw data:** 2007 Responses / Courses: 2007: 12 of 40 courses reported in both years.
- 2013: 126 of 40 courses reported in both years.
- Nearly all questions were essentially identical in both years; some additions for 2013.

**Compare results of Teaching Practices Survey in both 2007 and 2013**

**Examples of actions**

**Instructors’ attitudes (culture)**

1. **“What is the biggest BARRIER to achieving more effective student learning in your course?”**

2. **“What CHANGES could be made at UBC to help you teach more effectively?”**

**Coded answers to two open-ended questions:**

<table>
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**Course topics in EOSC 1st 2nd and 3rd terms of oceanography**

<table>
<thead>
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<th>Term</th>
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**Earth Life**

- 34 of 35 courses...