## Introduction

**Paired teaching** is an arrangement in which two faculty are collaboratively responsible for all aspects of teaching a course. By pairing an instructor experienced in research-based instructional strategies (RBIS; the “expert”) with an instructor with little or no experience in RBIS (the “novice”), paired teaching can be used to promote the adoption of RBIS [1].

**Goal:** What factors make for effective professional development in teaching via paired teaching?

## Method

We focus on four novice instructors: A, B, C, and D.

**Post-course interviews** were analyzed for:
1. The relevant “input” factors that characterize paired teaching arrangements.
2. The novice instructors learning about teaching.
3. Specific connections between the input factors and faculty outcomes.

Evidence for learning comes in different forms. **Strong evidence of learning:** The transfer of teaching techniques to an antagonistic scenario (i.e., a course for which there exists barriers to using RBIS). **Moderate evidence of learning:** The use of RBIS while teaching the same course again individually or a development in professed attitudes towards RBIS. **Weak evidence of learning:** Using RBIS while pair-teaching—the existing course structure means that novice instructors are very likely to teach in a reformed style while pair-teaching.

### 1. Input factors in paired teaching

<table>
<thead>
<tr>
<th>Novice instructor</th>
<th>Course (year)</th>
<th>Context*</th>
<th>Novice prior experience*</th>
<th>Approach of novice*</th>
<th>Expert instructor</th>
<th>Relationship*</th>
<th>Teaching assignment sequence*</th>
<th>Support*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>I (2013)</td>
<td>First-year large-scale calculus based physics course using active learning techniques. Multiple sections and instructors. Structure and materials established.</td>
<td>&lt; 1 year teaching. No experience with RBIS.</td>
<td>Intention to learn “tried and tested” methods.</td>
<td>Instructor Y, teaching stream tenured. 10 years teaching experience. 10 years PER experience.</td>
<td>“Incredibly friendly.”</td>
<td>Taught course I individually in next two years.</td>
<td>No science education specialist (SES) support.</td>
</tr>
<tr>
<td>B</td>
<td>I (2014)</td>
<td>Same context as A.</td>
<td>&lt; 5 years teaching. Some previous exposure to RBIS.</td>
<td>Saw paired teaching as an “apprenticeship.”</td>
<td></td>
<td>“I do like them as [a person].”</td>
<td>Taught both course I and other similar courses in subsequent year.</td>
<td>SES provided feedback from classroom observations and student interviews.</td>
</tr>
<tr>
<td>C</td>
<td>I (2015)</td>
<td>Same context as A.</td>
<td>10 years teaching at all levels. Some previous exposure to RBIS.</td>
<td>Sought feedback from expert, but “most of the things weren’t new.”</td>
<td></td>
<td>“It was a very collegial.”</td>
<td>Taught upper division course III at the same time as pair-teaching. Will teach course I individually and course III next year.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>II (2015)</td>
<td>Same context as A.</td>
<td>10 years teaching at all levels. Some previous exposure to RBIS.</td>
<td>Focused on in-class product and not professional development.</td>
<td>Instructor Z, teaching stream tenure-track. 20 years teaching experience, 10 years PER experience.</td>
<td>“… we all got along.”</td>
<td>Will teach course II individually next year.</td>
<td></td>
</tr>
</tbody>
</table>

### 2. Novice instructors learning about teaching

- **Novice prior teaching experience**
  - Overall, the relatively less experienced novice instructors (A and B) reported learning more skills than the more experienced novice instructors (C and D).
  - Instructor B observed that “compatibility really makes a big difference when you’re doing this kind of work.” A positive relationship—which all four of cases had—may be a necessary condition for positive outcomes.

- **Course context / structure**
  - The established course structure created a low barrier to using RBIS. Instructors C and D taught in a manner consistent with the reformed structure.

- **Support of SES**
  - The support of the SES was important for instructor C’s developing attitude towards in-class activities; they conclude that “there is no doubt that they [workshops] improve engagement.”

### 3. Factors that affect outcomes

#### Approach of novice instructor

Instructors A and B were deliberate about learning about teaching, and took advantage of both observing the expert and receiving feedback from them. In contrast, there was comparatively little evidence of learning for instructor D, who did not focus on professional development.

#### Teaching assignment sequence

Instructors A and B went on to teach the same (or similar) courses; both instructors continued use of RBIS. Teaching an upper division course at the same time— and being scheduled for it next year—provided instructor C a concrete example to think about transfer.

#### Novice prior teaching experience

- **Overall,** the relatively less experienced novice instructors (A and B) reported learning more skills than the more experienced novice instructors (C and D).
- **Course context / structure**
  - The established course structure created a low barrier to using RBIS. Instructors C and D taught in a manner consistent with the reformed structure.
- **Support of SES**
  - The support of the SES was important for instructor C’s developing attitude towards in-class activities; they conclude that “there is no doubt that they [workshops] improve engagement.”

### 4. Factors that affect outcomes

#### Relationship between instructors

Instructor B observed that “compatibility really makes a big difference when you’re doing this kind of work.” A positive relationship—which all four of cases had—may be a necessary condition for positive outcomes.

#### FAQ

- **Do instructors enjoy paired teaching?** Yes! Described as “a lot of fun” and “one of the best teaching experiences I ever had.”
- **Compared to teaching individually, how much time does paired teaching take?** Same to less! Described as “about the same workload as the second time I taught the course, entirely myself!” and “a quarter time savings.”

### Future work

- **Follow A—D: Does it transfer to new situations?**
- **More pairs, more examples, more data**

---

**A place of mind**

**The University of British Columbia**

---

**A comparison of paired teaching models in large-scale introductory physics courses**

Jared Stiang and Linda Strubbe
Department of Physics and Astronomy, UBC

---

**FAQ**

- **Do instructors enjoy paired teaching?** Yes! Described as “a lot of fun” and “one of the best teaching experiences I ever had.”
- **Compared to teaching individually, how much time does paired teaching take?** Same to less! Described as “about the same workload as the second time I taught the course, entirely myself!” and “a quarter time savings.”

---

**Support of SES**

The support of the SES was important for instructor C’s developing attitude towards in-class activities; they conclude that “there is no doubt that they [workshops] improve engagement.”

---

**Additional information:**

- **Instructor Y,** teaching stream tenured, 20 years teaching experience, 10 years PER experience.
- **Follow A—D:** Does it transfer to new situations?
- **More pairs, more examples, more data**

---

**References:**

[1] C. Henderson, A. Beach, and M. John and Deb Harris, the UBC Faculty of Science, and the UBC Department of Physics and Astronomy. (2009).