You can’t teach wildlife and fisheries online, can you?

A Comparison of Student Learning and Satisfaction in Two Online and Face-to-Face Courses

Natural Resource Management

South Dakota State University

Melissa Wuellner, David Willis, Gail Tidemann and Denise Peterson
Background

- Number of students taking courses online increasing and growth expected to continue.
- 31% of students take at least one online course.
Background

- Sloan Consortium 2011 report:
  - The growth rate for online enrollments far exceeds the 2% growth in the overall higher education student population.
  - Enrollment for most fully online programs in most disciplines are growing annually.
Background

• Natural resources management education also increasing in online presence.
  – Professional science masters programs.
  – At least one fully online M.S. and one B.S. in wildlife and fisheries degree in the U.S.
  – South Dakota State University offers a fully online A.A. in general studies with an emphasis in wildlife and fisheries sciences.
Questions

• How does online education compare to traditional face-to-face education?

• Can students learn just as well in online classes, particularly when the subject is “hands on”?

• Can science be taught effectively online?

• Can you teach wildlife and fisheries science and management online?
What does the literature say about online education in general?

• Depends on who you ask!
  – Critiques of meta-analysis (Smith Jaggers and Bailey 2010)
What about online *science* education?

- Concerns that there will be *less* learning
  - Lack of hands-on experience may create learning deficits (Carr 2000)
  - Could be just as good (Schoenfeld-Tacher et al. 2001)

- Getting better at providing “at home” lab activities.
What about online education in the *natural resources disciplines*?

- NOTHING! (as far as we can find)

- Bottom line: More rigorous study needed!
The Objective

• Determine whether student learning and satisfaction is similar in online and face-to-face (F2F) for two introductory courses in the wildlife and fisheries curriculum.
What factors influence student learning?

- Time on task (Means et al. 2009)
  - Life factors (work, childcare, course load)
- Previous experience with online education
- Learning style?
- Positive experience
  - Overall satisfaction with the course
  - Perceptions of student-faculty interaction
  - Perceptions of student-student interaction
Study Design

- Pseudo-experiment designed to test:
  - Level of learning
  - Student satisfaction
  - Factors related to both

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall 2011</th>
<th>Spring 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>WL 220</td>
<td>F2F</td>
<td>Online</td>
</tr>
<tr>
<td>WL 230</td>
<td>Online</td>
<td>F2F</td>
</tr>
</tbody>
</table>
Study Design

• Students allowed to enroll either online or F2F, depending on preference or needs (36 students per section)

• Online and F2F courses adapted to be as similar as possible
  – Content (reading, lecture materials)
  – Assessments (quizzes and assignments)
  – Instructor “presence” (in-person v. online)
Data Collection

• Student learning:
  – Overall course performance
  – Performance on different types of assessments (e.g., quizzes versus application assignments)
  – Activity log (submitted biweekly)

• Student satisfaction:
  – eIDEA survey

• Instructor time on task
  – Activity log (daily)
Data Collection

• Other influential factors
  – Demographics, learning style, life challenges
## Results: Demographics

<table>
<thead>
<tr>
<th></th>
<th>WL 220</th>
<th></th>
<th>WL 230</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F2F</td>
<td>Online</td>
<td>F2F</td>
<td>Online</td>
</tr>
<tr>
<td>% over the age of 23</td>
<td>9.7</td>
<td>17.7</td>
<td>10.7</td>
<td>40.0</td>
</tr>
<tr>
<td>% taking &lt; 12 credit hours</td>
<td>0</td>
<td>5.8</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>% working &gt;30 hours/week</td>
<td>2.4</td>
<td>8.8</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>% reporting childcare</td>
<td>0</td>
<td>2.9</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>responsibilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% reporting previous online</td>
<td>67.5</td>
<td>67.7</td>
<td>53.6</td>
<td>65.0</td>
</tr>
<tr>
<td>course experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Results: Demographics

WL 220 Learning Styles
Results: Demographics
WL 230 Learning Styles

![Bar chart showing learning styles in F2F and Online settings.]

- **Visual**
- **Auditory**
- **Kinesthetic**

% students reporting

- **F2F**
- **Online**
Results: Overall Grades

WL 220

<table>
<thead>
<tr>
<th>Grade to date</th>
<th>Percentage of students in class</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F2F: 1, Online: 2</td>
</tr>
<tr>
<td>B</td>
<td>F2F: 30, Online: 18</td>
</tr>
<tr>
<td>C</td>
<td>F2F: 30, Online: 35</td>
</tr>
<tr>
<td>D</td>
<td>F2F: 10, Online: 20</td>
</tr>
<tr>
<td>F</td>
<td>F2F: 20, Online: 24</td>
</tr>
</tbody>
</table>
Results: Scores by Taxonomic Group

WL 220

[Bar chart showing mean scores on assignments for different taxonomic categories: Remember, Understand, Analyze, Apply, Create. The chart compares F2F and Online methods.]
Results: Overall Grades

WL 230

Percentage of students in class

Grade to date

F2F
Online

A
B
C
D
F
Results: Scores by Taxonomic Group

WL 230

Mean % score on assignments

- F2F
- Online

Bloom's taxonomic category:
- Remember
- Understand
- Analyze
- Apply
- Evaluate
### Results: Student Time on Task

<table>
<thead>
<tr>
<th></th>
<th>Online</th>
<th>F2F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WL 220</td>
<td>WL 220</td>
</tr>
<tr>
<td></td>
<td>WL 230</td>
<td>WL 230</td>
</tr>
<tr>
<td><strong>Online</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WL 220</td>
<td>4.53</td>
<td>3.41</td>
</tr>
<tr>
<td></td>
<td>(0.19)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>WL 230</td>
<td>5.21</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>(0.27)</td>
<td>(0.15)</td>
</tr>
</tbody>
</table>


Results: Student Time on Task
(Relationship to Overall Course Grades in WL 230 Online)
Results: Student Time on Task
(relationship to overall course grades in WL 220 F2F)

Average hours spent outside of class

Grade

A  B  C  D  F
Results: In-class Attendance
(Relationship to Overall Course Grades in WL 220 F2F)
## Results: Instructor Time on Task

<table>
<thead>
<tr>
<th></th>
<th>WL 220</th>
<th>WL 230</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F2F</td>
<td>Online</td>
</tr>
<tr>
<td>Average hours spent per week</td>
<td>6:50</td>
<td>8:48</td>
</tr>
<tr>
<td>Hours spent per student</td>
<td>1:45</td>
<td>2:08</td>
</tr>
</tbody>
</table>
## Results: Student Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>WL 220 (F2F)</th>
<th>WL 230 (Online)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student review of progress on relevant objectives</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Student review of instructor</td>
<td>4.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Student review of course overall</td>
<td>4.1</td>
<td>3.9</td>
</tr>
</tbody>
</table>
Discussion

• More study is needed:
  – More semesters of data
  – Longitudinal comparisons (e.g., How do students fare in the 400-level courses?)

• Preliminary analyses show similar overall performance in online and F2F environments, but performance on certain taxonomic tasks may differ between environments.
Discussion

• Emphasize to students the importance of time spent on learning activities, particularly for the online environment.

• Instructors in online environments *may* invest more time to students than those in F2F courses.

• Satisfaction is fairly similar in both environments, but students often comment that they miss the in-person interaction. *Could this be replicated in an asynchronous online course?*

