Conducting an Applied Research Study on Online Professional Development

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Education Development Center
Conducting an OPD Applied Research Study

- NSF DRK-12
- Impact of WGBH Teachers’ Domain Teaching HS Biology course
- Experimental design

Who can participate?
- New York State public high school 10th and 11th grade biology teachers whose students are eligible to take the Living Environment Regents Examination

What do teachers receive?
- Teachers receive a new, online professional development course from PBS TeacherLine: New York State High School Biology Teachers. The course is designed to help teachers develop inquiry-based approaches to teaching genetics and evolution.
- A stipend ranging from $100 to $460 based on yearly basis, for each year of participation in the study.

What will participating in this 2-3 year study involve?
- Teachers will enroll in an online professional development course in winter 2009 or summer 2009. The course will take up to 10 hours over 2 months.
- The course will focus on teaching genetics and evolution using inquiry-based approaches. Teachers will receive additional modules on teaching science.
- For the purposes of this study, the three modules as well as which criterion teachers take the course will be selected by NBCSN.
- Teachers will have a choice of two start dates for the course.
- Teachers will take two instruments, one before and one after the course.
- In the academic year following the course, teachers’ Living Environment students will take two brief assessments, one at the beginning and one at the end of the school year. The assessments will consist of questions like those on the Living Environment Regents Exam and will cover genetics and evolution content.
- Teachers will complete a survey at the beginning and end of each school year.
- Teachers will work with the research team to obtain permission from parents/guardians.
- The research team will help teachers obtain the necessary administrative approval to participate.

Who is supporting this study?
- This study is supported by the National Science Foundation (NSF), the Education Development Center’s Center for Online & Distance Education (OCDE), and the NSF DRK-12 program.
- For more information, please contact teacher development, EDC, or ABE-NY.

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http://teacherline.ny teach.org/ABE-T1.aspx

Bring new science professional development and resources to your school

EDC Education Development Center

NSDL National Science Digital Library
Application:

Evidence

As you've seen, scientists begin with observations, which lead to questions and the development of a hypothesis. They then develop a plan to seek evidence that supports or refutes the hypothesis.

Before going on to the next two resources, think about what you know about scientific evidence.

- What kinds of evidence did the scientists you've encountered so far in this session seek?
- What evidence are you seeking in your seed experiment?
- What different kinds of evidence might provide convincing support for a hypothesis that explains, for example, the extinction of the dinosaurs?

Interactive

This interactive feature looks at how scientists have used evidence to support their hypotheses about events in the past.

What Killed the Dinosaurs?

View

See resource page

Video

This video describes how a scientist used evidence from a field study to test his hypothesis.

The Red Queen

View

See resource page
Research Questions

1. Does participating in the online course increase teacher knowledge of biology, instruction, and digital media use?

2. Is student learning influenced by teachers’ participation in the online professional development course?
Study Participants

ABE-NY Participant Geographic Distribution
Teacher Results
Year 1 Data

Pedagogical Content Knowledge

Mean Performance (out of 16)

- Control (n=55)
- Treatment (n=32)
- Treatment (n=32): Year-Long Change

Beginning of Year assessment
Post-course assessment
End of Year assessment

Use of Digital Resources

Mean Performance (out of 8)

- Control (n=55)
- Treatment (n=32)
- Treatment (n=32): Year-Long Change

Beginning of Year assessment
Post-course assessment
End of Year assessment
Student Results (preliminary)
Year 1 Data

- No significant difference in biology content knowledge/growth in knowledge.
  - Higher year-end scores, stronger growth
    - Higher positive attitudes
  - 9th graders
Case Study Research Questions

1. How are teachers using digital resources during their genetics and evolution units to enhance student engagement and learning?

2. What pedagogical strategies do teachers use during their genetics and evolution units, in lessons involving digital resources and those not involving digital resources?
Case Studies: Methods

- Teacher interviews
- Observations
- Student focus groups
- Artifact packages
Let’s talk

- Next steps*
- DL/DigiRes Research Agenda?*

Research methods:
- Recruitment
- Retention/attrition*
- Instrumentation
- Data collection procedures
- Research design decisions
- Advisory board role
Discussion: Retention/Attrition Persistence, by cohort

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<tr>
<th>Assignment</th>
<th>Cohort 1</th>
<th>Cohort 2</th>
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<tbody>
<tr>
<td>Assigned to Group*</td>
<td>70</td>
<td>74</td>
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<tr>
<td>Completed course (Summer 2008)</td>
<td>34</td>
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<td>Completed activities, Sept 2008 – June 2009</td>
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<tr>
<td>Completed course (Summer 2009)</td>
<td>-</td>
<td>38</td>
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<tr>
<td>Completed activities, Sept 2009 – May 2010**</td>
<td>28</td>
<td>36</td>
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Cohort 1 Persistence: 48%, 45%, 40%
Cohort 2 Persistence: 70%, 51%, 49%