Blending the classroom to allow student research with online publication

Blended Learning in the Liberal Arts conference
24 May 2018
Bryn Mawr College

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What we’ll discuss

• Why I took this on.
• Where, when, and what was done.
• What were the online and in-class/in-lab components?
• What did the process look like?
• What tools were needed?
• Tips for success.
• How could this be broadly applicable?
Why I took this on

• Create authentic independent research experiences for undergraduates at a time when more students are seeking close interactions with few faculty.

Where, when, and what was done?

• Where - At Wheaton College in Norton, Massachusetts
• When - 2015, 2016, 2017
• What - A blended class combining online learning and idea-exchange with in-class and in-lab planning, collaboration, and experimentation.
What were **Online** and **In-class or In-lab** components?

<table>
<thead>
<tr>
<th>Online</th>
<th>In-class or In-lab</th>
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<tbody>
<tr>
<td>• Topic proposals</td>
<td>• Introduction</td>
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<tr>
<td>• Budget creation</td>
<td>• Selection of topics</td>
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<tr>
<td>• Videos of lab methods</td>
<td>• Materials selection</td>
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<tr>
<td>• Paper submission</td>
<td>• Lab experiments (many weeks)</td>
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<td>• Reviews submission</td>
<td>• Addressing reviewer’s concerns</td>
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<td>• Editorial exchanges</td>
<td>• Final presentations</td>
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<td>• Rebuttal letter and final submission</td>
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What did the process look like?

**Messy!**

(Here I showed pictures of the students in action – eagerly looking up papers and finally doing their experiments.)
What did the process look like?
What tools and resources were needed?

- iPhone and Camtasia for video creation
- Moodle for information exchange (for example, using wikis)
- Google Drive for document exchange
- Internet server or DSpace and Digital Archives librarian for final article publishing and metadata guidance.
What tools and resources were needed?

- iPhone and Camtasia for video creation
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- Google Drive for document exchange
- Internet server or DSpace and Digital Archives librarian for final article publishing and metadata guidance.

“Bryn Mawr is doing some amazing library and digital fluency work with their students, and a goal of mine is to adopt and adapt some of their work at Wheaton.”

Kate Boylan, Director of Archives and Digital Initiatives

DSpace = http://www.duraspace.org/dspace/
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• [https://digitalrepository.wheatoncollege.edu/](https://digitalrepository.wheatoncollege.edu/)
  This is Wheaton’s digital repository that uses DSpace.

• DSpace is free to download from [http://www.duraspace.org/dspace/](http://www.duraspace.org/dspace/)

• Customizing DSpace takes programming/developer skills. (Wheaton pays annually for these services.)
Recent Submissions

Preliminary observation of neuroprotective effects of k252a on axonal outgrowth in Gallus gallus neurons exposed to amyloid-β.
Asherman, Nathaniel G. (Wheaton College, Norton, Mass.), 2017-12-04

Preliminary Study of Extracellular Beta-amyloid Effect on Axonal Mitophagy in Embryonic Peripheral DRG Neuronal Cells
Rauf, Omar Nazhem (Wheaton College, Norton, Mass.), 2017-12-04

Preliminary study of effects of Sphingosine 1-phosphate on axonal growth of Gallus gallus embryos neurons.
Shao, Jintan, T. 1999 - (Wheaton College, Norton, Mass.), 2017-12-04

Preliminary study of effects of exogenous amyloid-beta protein 25-35 on mitochondrial function in glial cells of Gallus gallus.
McKeon, Ryan J., 1995 - (Wheaton College, Norton, Mass.), 2017-12-04

Preliminary study of effect of exposure of neuronal cultures to extracellular 25-35 beta amyloid fragment and K-252a on growth cone dynamics
Kanne, Cassandra R. (Wheaton College, Norton, Mass.), 2017-12-04

Preliminary study of effects of tau-441 on mitochondrial transport in glial cells.
Southwell, Daniel J., 1990 - (Wheaton College, Norton, Mass.), 2017-12-04

Preliminary study of effect of exogenous tau-441 on mitochondrial transport in glial.
Morgan, Matthew Xavier, 1997 - (1)
O’Flynn, Lana C. (1)
Rauf, Omar Nazhem (1)
Shao, Jintan, T. 1999 - (1)

Preliminary study of nerve growth factor as a regenerative factor for ganglion cell growth.

Preliminary study of brain injury leads to changes in growth factor expression.

Preliminary study of effects of exogenous growth factors on neurite outgrowth in glial.
Morgan, Matthew Xavier, 1997 - (1)
O’Flynn, Lana C. (1)
Rauf, Omar Nazhem (1)

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Shao, Jintan, T. 1999 - (1)
Wheaton Journal of Marine Biology Research

Collections in this community
2003 Issue 1
2003 Issue 2

Recent Submissions

Hermit crabs and the choices they make.

Hydrodynamics of a fusiform shape.

Feeding adaptations of the Balanus balanus barnacle: how the rates and extensions of cilia change depending upon changes in fluid flow.

Prey sensation in sea star Asterias forbesi.

Effects of changing light intensity and wavelength on re-orientation of Aiptasia pallida.

Phototaxis vs. shelter in Hemigrosus sanguineus.
Tips for success

• Crystal clear expectations from the outset including about learning goals.
• Clear protocols for all steps (for classroom written and laboratory wetbench work)
• “Experimental spirit” (i.e. high tolerance for uncertainty)
• Creative problem solving skills
• Laser focus on the learning goals = an authentic and collaborative research experience

Unexpected benefits

• My course evaluations improved.
• Students gained appreciation of benefits of peer review for the author themselves and the community at large.
• Students felt sense of pride in their accomplishments.
• Students became part of trans-generational research collaborations.
How could this be broadly applicable?

• Peer review is a powerful learning tool.
  Example: Reimagining Peer Review in the Comics Classroom Using Digital Writing and Publication (Janine Utell, Widener University)
  Lightning round presentations yesterday.

• Blended formats make “project courses” feasible.

• Digital archiving of appropriate student work makes it accessible for future access by student authors and possible employers.

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DSpace is maintained by our developer, Atmire, and their services (20 hours of support and minimal customization/year) and our contract cost about $3500/year. DSpace itself is free to download; customizing it takes programming/developer skills.

I do not believe our stuff will disappear if we lapse in payment, but our support and ability to customize our material will: Wheaton (at this point) needs a developer behind the scenes. I ensure that we have redundancy of *some* (digitized content from the DigiLab since my time here) on an AmazonS3 account (a "dark archives of sorts). Our developers also use S3 as a dark archive for all of our content on DSpace as a backup.

- Kate Boylan, Director of Archives and Digital Initiatives