

May 20th, 9:00 AM - 10:15 AM

Keynote: NGLC Blended Learning Study Report and Where Do We Go from Here?


Kimberly Cassidy

Bryn Mawr College, kcassidy@brynmawr.edu

Jennifer Spohrer

Bryn Mawr College, jspohrer@brynmawr.edu

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NGLC Blended Learning Study Report and Where Do We Go from Here?

Blended Learning in the Liberal Arts Conference • 20 May 2013



NGLC Blended Learning Study Report

OVERVIEW

Why Blended Learning?

- Idea for study came from discussions of blended learning among LAC deans
- Research on blended learning suggested it was extremely effective
 - Higher satisfaction with blended courses¹
 - Greater student engagement²
 - Improved student performance³

But, Studies at *Large* Institutions

- Would blended learning offer the same or equivalent benefits at a liberal arts college?
 - Ex. Student satisfaction related to reduced “seat time”
 - Ex. Control courses vs. typical LAC course
- Was it compatible with culture and values of liberal art colleges?

Goals of the Study

1. Encourage and support faculty experimentation
 - 14 Bryn Mawr faculty, 2011-2012
 - 40 faculty at 25 partner colleges, 2012-2013
2. Collect and analyze data on these experiments
 - Faculty and student perceptions of impact
 - Quantitative assessment of impact (where possible)

Research sponsored by a grant from



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COLLEGE

What do we mean by “blended”?

1. Students **receive feedback on learning** outside classroom through computer-based materials
2. Extra-classroom component alters or informs how instructor uses class time

No Other Prescriptions

- No requirement to reduce “seat” time
- **Faculty** identify pedagogical challenges & goals
- Pedagogy drives technology

Kinds of Courses Developed

Subjects

Anthropology
Art History
Biochemistry
Business
Biochemistry
Chemistry
Comp. Science
Economics
Education
Engineering
Geosciences

History
Mathematics
Neuroscience
Physics
Political Science
Psychology
Sociology
Spanish

The screenshot shows the Bryn Mawr College website. The main heading is "BRYN MAWR". Below it, there is a navigation menu with categories: Academics, Admissions & Financial Aid, Student Life, Campus, Offices, and About Us. The page is titled "Blended Courses We've Developed". The text on the page states: "Bryn Mawr has partnered with 40 other liberal-arts colleges from across the United States that are interested in blended learning to share resources, techniques and research findings. Part of the Next Generation Learning Challenges grant funding was set aside to provide faculty at Bryn Mawr College and partner institutions with stipends to help offset the time and effort involved in developing a blended course as part of the project. These faculty have in turn agreed to share resources, methods, experiences and data with the community to further future adoption and our research into the efficacy of blended learning strategies in a liberal arts college or small institutional setting." Below this text is a table with two columns: "Subjects" and "Institutions".

Subjects	Institutions
Anthropology	Albright College
Art History	Bard College
Biology	Bowdoin College
Biochemistry	Bryn Mawr College
Business	Colorado College
Chemistry	Connecticut College
Computer Science	Franklin and Marshall College
Economics	Goucher College
Education	Grinnell College
English	Haverford College
Engineering	Kalamazoo College
Geography/Geology	Kenyon College

See [our website](#) for course descriptions, syllabi, and links to resources used.

Summary of Findings

1. Blending can improve learning outcomes in LACs
2. Faculty and students find it useful and consistent with LAC values
3. Keys to success:
 - a. Pedagogy drives technology
 - b. Focus on mitigating “start up costs”
[[“Swarthmore College gets it”](#)]



NGLC Blended Learning Study Report

POSITIVE IMPACT ON STUDENT LEARNING

Merit Completion Rates*

- 85% for all BMC blended courses in piloted study
- 93.5% for piloted gateway STEM courses
 - vs. 83% average for non-blended gateway STEM courses

*Proportion completing with grade of 2.0 or higher required for credit toward major.

Improvement over Historical Norms

- Historical comparison possible for four courses at BMC: BIOL101, CHEM101, CHEM103, GEOL202
- In blended version of three BIOL101, CHEM101 and GEOL202
 - Average grade was ~ 1 std. dev. higher
 - Merit completion rate was 100%, which was 0.8-1.5 std. dev. higher

4th Course: CHEM103

- Mixed results when compared to historical data
 - Average grade .2 std. dev. higher
 - Merit completion rate was 87.2%, which was 0.5 std. dev. LOWER
- But, analysis of learning data suggests online materials did have strong positive impact

4th Course: CHEM103

- Strong correlation between % online material completed and final grade based on exams ($r(60)=.417$, $p<.001$)
- For undergraduates, adding completion rate better predicted final grade than SATM alone
 - SATM + % completed: $R^2 = .58$ ($F(2, 36) = 15.87$, $p < .001$)
 - SATM alone: $R^2 = .30$ ($F(1, 37) = 24.98$, $p < .001$)
- Similarly strong correlation observed in smaller course at partner college ($r(17)=.884$, $p<.001$)

Summary

- Students who do their homework consistently fare better
- Probably not unique to blended courses, but
 - Patterns *more visible* with online assessment
 - Online assessments graded more quickly so students know sooner
 - Amount of formative assessment often increased



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FACULTY PERSPECTIVES


Strong Faculty Uptake

- **All** faculty in Bryn Mawr pilot have continued
- Majority of respondents from partners have/will
- Often report carrying tools/techniques over into other courses
- At BMC, visible experimentation outside of initial cohort

Why? Formative Assessment

Mozilla Firefox
brynmawr.edu https://moodle.brynmawr.edu/mod/quiz/reviewquestion.php?state=8925&number=17

17
Marks:
1/1



Name the mineral:
sillimanite ✓
Note: Case does not matter, but spelling does!

Consciously or unconsciously, we identify minerals using a few key characteristics that we associate with them. Name the two or three characteristics of this mineral that allowed you to name it:

zotero

- Assess more often and quickly
- Emphasize formative assessment and mastery
- Take advantage of
 - “Testing effect”⁴
 - Reviewing at intervals⁵

Why? Learning Data

Name the mineral:
sillimanite ✓
Note: Case does not matter, but spelling does!

Consciously or unconsciously, we identify minerals using a few key characteristics that we associate with them. Name the two or three characteristics of this mineral that allowed you to name it:
radial, gray ✓
Note: You get credit for listing your criteria -- the green check mark does not mean they are correct!

[Make comment or override grade](#)

Correct
Marks for this submission: 1/1.

History of Responses:

#	Action	Response	Time	Raw score	Grade
1	Grade	serpentine,	16:20:38 on 7/09/11	0.5	0.5
2	Grade	andalusite,	16:21:00 on 7/09/11	0.5	0.5
3	Grade	kyanite,	16:21:21 on 7/09/11	0.5	0.5
4	Grade	quartz,	16:21:50 on 7/09/11	0.5	0.5
5	Grade	amphibole,	16:22:03 on 7/09/11	0.5	0.5
6	Grade	pyroxene,	16:22:12 on 7/09/11	0.5	0.5
7	Grade	calcite,	16:22:51 on 7/09/11	0.5	0.5
8	Grade	epidote,	16:23:10 on 7/09/11	0.5	0.5
9	Grade	plagioclase,	16:23:23 on 7/09/11	0.5	0.5
10	Grade	sillimanite,	16:53:08 on 7/09/11	1	1
11	Grade	sillimanite, radial, gray	16:53:29 on 7/09/11	1	1
12	Close&Grade	sillimanite, radial, gray	16:53:29 on 7/09/11	1	1

- Real-time information on learning
- Supports “agile” teaching
- Leads to more fruitful conversations with students

Rational Decision-Making

- When faculty decided not to continue, it was through cost-benefit analysis:
 - I won't be teaching course again/frequently
 - Available materials don't work, and developing my own would be an inefficient use of my time
- In other words: LAC faculty are *rational actors* when rejecting as well as adopting technology

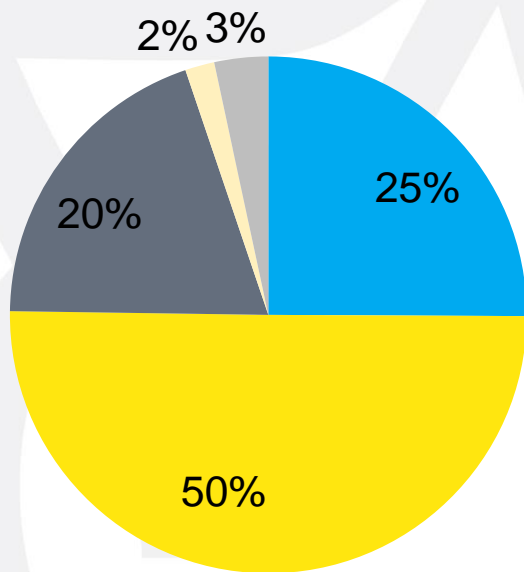


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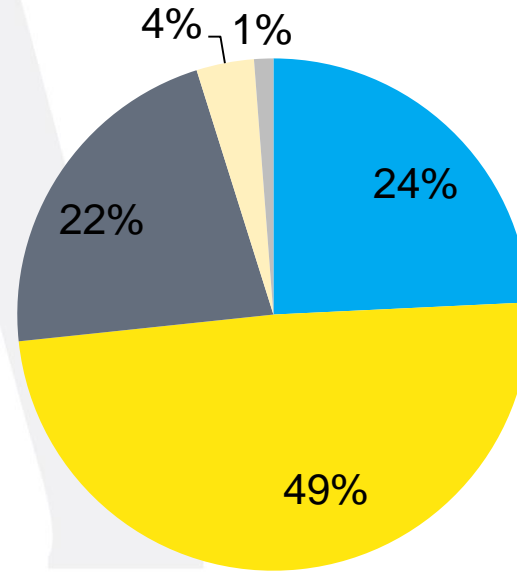
STUDENT PERSPECTIVES

Student Feedback Mostly Positive

Do you think the computer-based materials impacted (have impacted) how well you did (are doing) in this class?



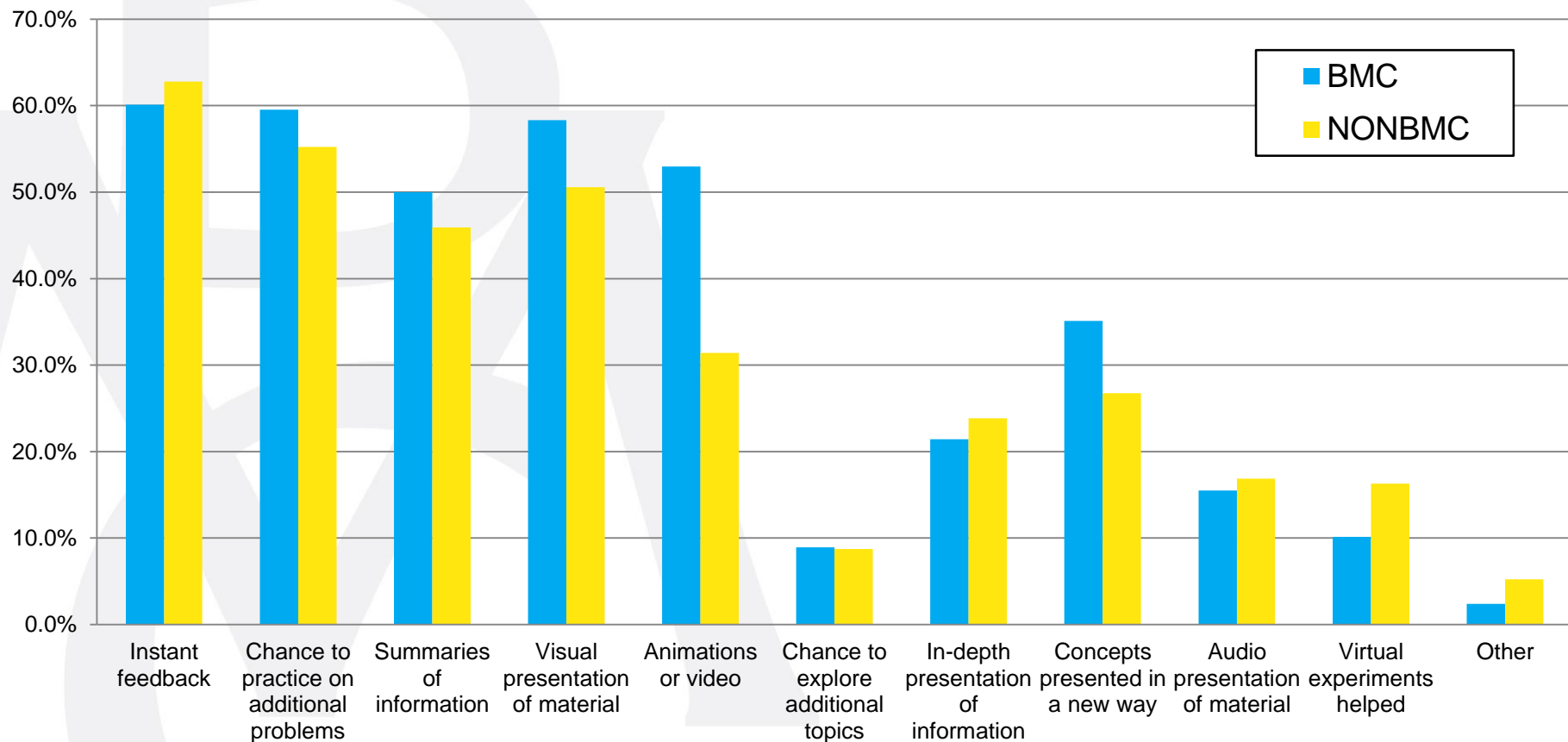
At Bryn Mawr



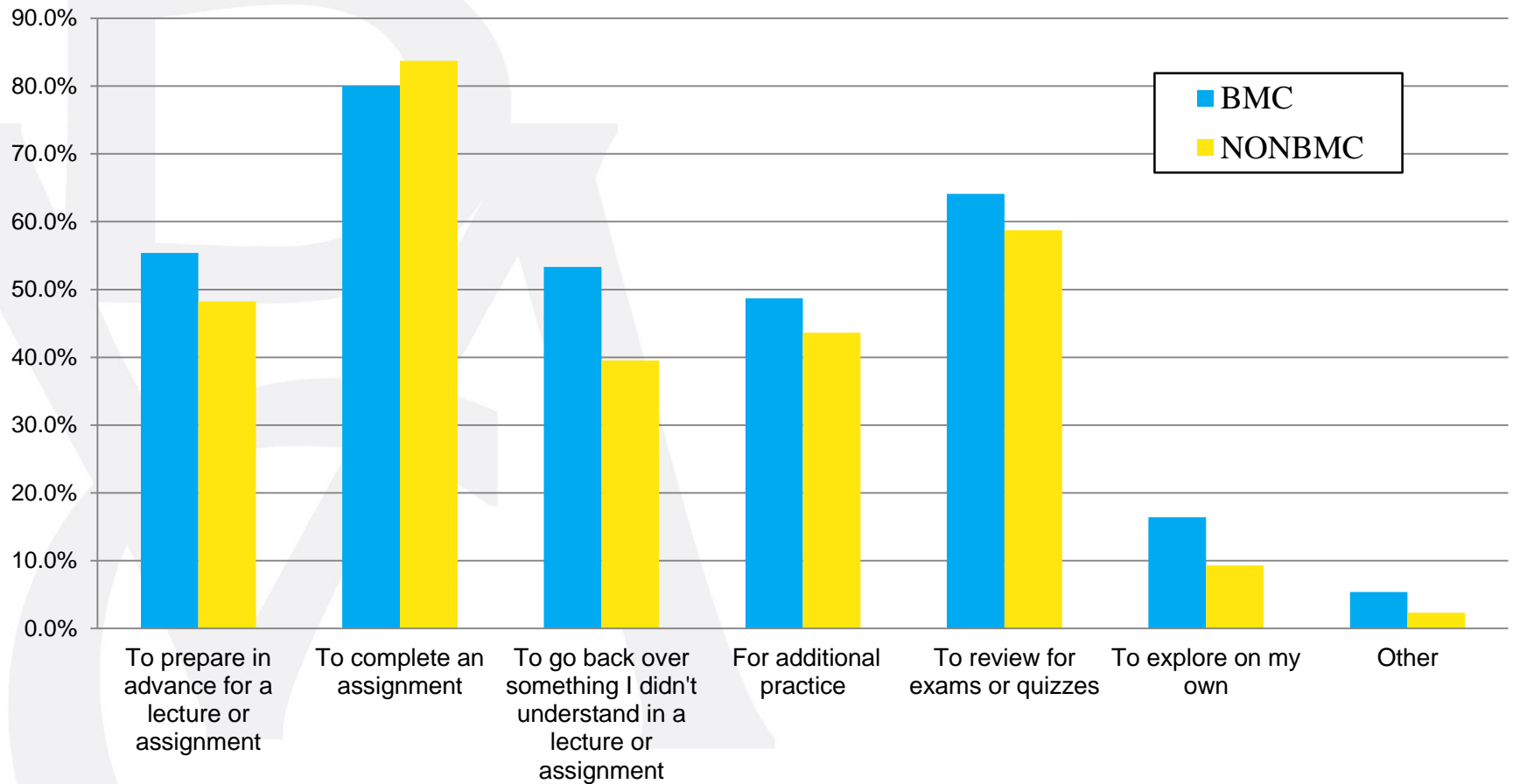
At partner colleges

- Yes, I did considerably better than I would have without them.
- Yes, I think they helped somewhat.
- I don't think they really helped, but they didn't hurt either.
- I think they had a negative impact on how well I did.
- Not sure

What was helpful about online materials?



How did you use online materials?




Why? Instant Feedback

- Can ask better questions
- Can get help before class moves on
- Can better structure study time
- Like being able to practice before “it counts”
- Like being able to STOP once they’ve gotten something

Mozilla Firefox
brynmawr.edu https://moodle.brynmawr.edu/mod/quiz/reviewquestion.php?state=8925&number=17

17
Marks:
1/1



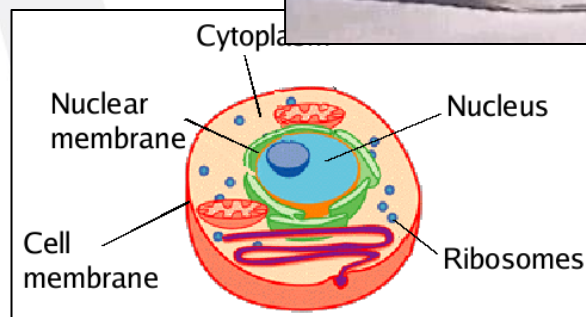
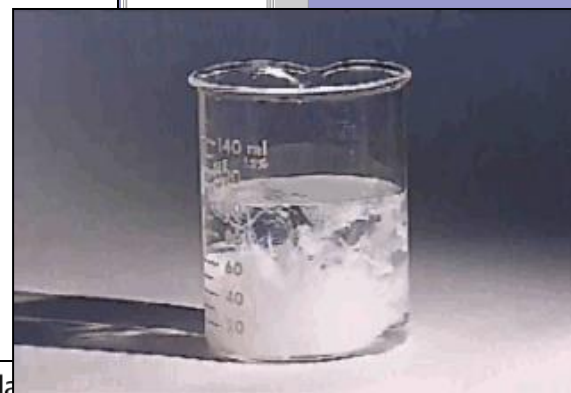
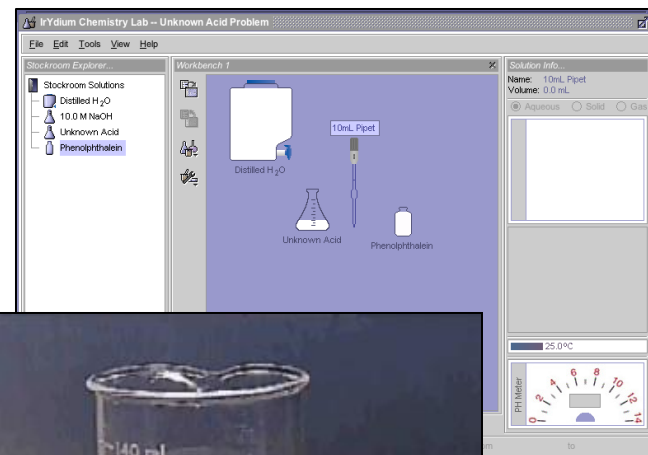
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zotero

Why? Audiovisual vs. Text

- Animations, simulations, video demos, diagrams are very helpful⁶
- But, not necessarily
 - Long videos
 - Videos of person talking
 - In lieu of classroom demos





NGLC Study Report

CONDITIONS FOR SUCCESS

What We've Learned

- Pedagogy must drive technology
- Adoption is rational, cost-benefit analysis
 - Main barrier is heavy “start-up costs”
 - Second barrier is lack of suitable materials
 - Keep in mind factors that might limit ability to capitalize on investment – reusability, longevity, etc.



WHERE DO WE GO NEXT?

Continue Crowdsourcing to Lower Start-Up Costs

- Annual conference / archives:
http://repository.brynmawr.edu/blended_learning/
- “Tools for Blended Learning” webinar series
specific to LAC faculty
- New collaboration website:
<http://serendip.brynmawr.edu/exchange/blended>

Research and Development

- Development of online course materials in areas of collective need/expertise (ex. research prep)
- Continued coordination of research on impact of techniques, materials, etc.

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