Conducting Research in Online and Blended Learning Environments

Online Learning Consortium Webinar
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Charles Graham and Anthony Picciano
Learn more about the upcoming Learning Analytics Special Issue: [http://onlinelearningconsortium.org/read/online-learning-learning-analytics-special-issue/](http://onlinelearningconsortium.org/read/online-learning-learning-analytics-special-issue/)

Presenters

Charles Graham

Tony Picciano
Teaching and Learning in 2016 –
Different Scenarios!
Critical Question:

Why conduct research in online and blended learning environments?

It is Dynamic and Ever Changing!

It is Different!

It Has Exploded Interest in Pedagogy!

Data Availability!
The Evolution of Online Education

Timeline

1990s
The 1st Wave

2000
The 2nd Wave

2008
The 3rd Wave

2014
The 4th Wave
The 1st Wave – 1990s

• Model – Pedagogical – (ALN)/Largely Text-Based

• Key Question: How to do online learning?

• Research – Case studies and evaluations.
The 2nd Wave – Early 2000s to 2008

• Model – Pedagogical - Blended Learning /Social and Multi-Media/Open Resources Evolve

• Key Question: How do we blend online learning techniques into mainstream classrooms?

• Research – Plethora of studies using different methodologies culminating in the USDOE meta-analysis (2010)
The 3rd Wave – 2008 to 2013/14

• Model – MOOC – Access/Cost Benefit Model/Social and Multi-Media Infused/Open Source Expands

• Key Question: Are MOOCs viable for teaching large numbers of students?

• Research – San Jose State University Study
The 4th Wave – 2014

• Model – Reconciliation of the 2nd Wave Pedagogical/Blended Learning & 3rd Wave Access/MOOC Models
• Key Question: How do we integrate the best of the blended and MOOC models?
• Research: This is evolving and is focusing on a variety of student, pedagogical, faculty, and access issues PLUS:
  1. learning analytics
  2. adaptive or differentiated learning
  3. expansion of competency-based instruction
  4. interactive media (games, simulations, multiuser virtual environments)
  5. mobile technology
Challenge to Faculty during the 4th Wave

*The Chronicle of Higher Education* in a survey of college presidents (N=349) focused on the future of innovation in higher education. (2014)

- **Direction:** Two-thirds of presidents of public institutions think that higher education is headed in the right direction, as do well over half of their private campus peers.
- **Modality:** An overwhelming majority of presidents—three quarters at private institutions and even more at public campuses—think that blended courses that contain both face-to-face and online components will have a positive impact on higher education
- **Focus:** Presidents say that when it comes to innovation in higher education, reformers pay too much attention to cutting costs and not enough to changing the model of teaching and learning
- **Change drivers:** Two-thirds of public-institution presidents think that politicians are the most influential drivers of change in higher education and half of private-campus presidents agree with that assessment. The presidents on both types of campuses believe strongly *that faculty should be the number one drivers of change.*
Recommendation

• Study / Test / Experiment with the technology.

• Use / Improve that which works.

• Discard that which does not work.

• Whatever we do, *we cannot ignore it*. 
Frameworks for Blended and Online Learning Research

Charles R. Graham
Instructional Psychology & Technology
Brigham Young University
### Three Types of Research

**Table 2.1.**

*Descriptions of Three Types of Theory Used in Research.*

<table>
<thead>
<tr>
<th>Research-Enterprise</th>
<th>Model/Theory Description</th>
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</table>
| *Explore* (scientific and technological) | · Answers “What exists?”  
· Defines  
· Categorizes |
| *Explain* (scientific)    | · Answers “Why does this happen?”  
· Looks for causality and correlation  
· Works with variables and relationships between them |
| *Design* (technological)  | · Answers “How do I achieve this outcome?”  
· Describes interventions for reaching targeted outcomes  
· Describes “operational principles” that make an intervention or design work |
Three Types of Research

Table 2.1. Descriptions of Three Types of Research

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“in [science] they are trying to understand how and why things happen, and in [technology, design] they are trying to discover how to influence things to happen”

(Gibbons, 2013, Ch 6)

- Describes “operational principles” that make an intervention or design work
Scientists made careful observations of bird flight and documented their findings.

Wright brothers wing warping based on this observation.
BL Example – Explore Research

Figure 1. Blended-learning taxonomy

Flight Example – Design Research

iterations – from glider to plane

Created their own propellers (based on ship propeller design)

Wind tunnel for testing wing shape designs

Built a light aluminum engine
Figure 2.5 Simplified visual illustration of an instructional design model using the “practical inquiry model” (Garrison & Vaughan, 2008).
Figure 2.5 Simplified visual illustration illustrating the "practical inquiry model" (Garrison & Vaughan, 2008).
Bernoulli’s Principle – used to describe why/how wings create lift

Establishes the relationship between pressure and velocity of a fluid
Figure 2.3 Simplified visual illustration of *explain* theory using the Community of Inquiry framework (Garrison & Vaughan, 2008)
Design-based Research - Iterations

Figure 2.7 Visual representation of design research that compares two different designs.
**Figure 2.8** Visual representation of design research that compares iterations of a design over time.

• Challenges
  – Too many comparison studies testing effectiveness of BL with traditional counterpart
  – Core attributes of the designs not clearly identified
  – Core attributes of the design focused on surface/physical attributes rather than pedagogical attributes
  – Need for more iterative designs over time
Questions?

Charles R. Graham
charles.graham@byu.edu

Resources on Blended Learning Research and Practice

Prepublication versions of BL research
For more information contact:

Charles Graham
Brigham Young University
charles.r.graham@gmail.com

Anthony Picciano
CUNY Graduate Center and Hunter College
apicciano@gc.cuny.edu
• Figures 2.1-2.9

• Explore Images

• Design Images

• Explain Images