

Continuous Improvement for Student Success

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Digital Promise Global

everylearner
←→
everywhere

Our Research

How might we increase **research use** in the design, development, and improvement of education programs, products, and practices?



Teaching
Science

Teacher

Attention
& Memory

Student
Motivation

Cognitive
& Learning

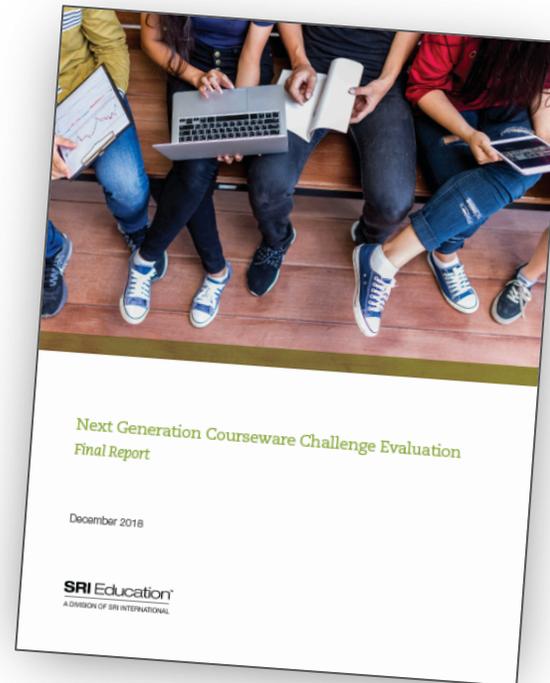
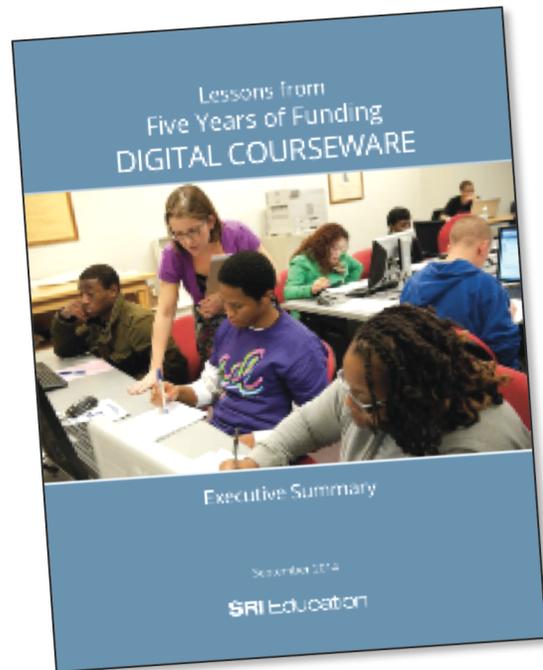
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Digital Promise[®]

Accelerating Innovation in Education

Our Prior Studies Of Postsecondary Digital Learning *

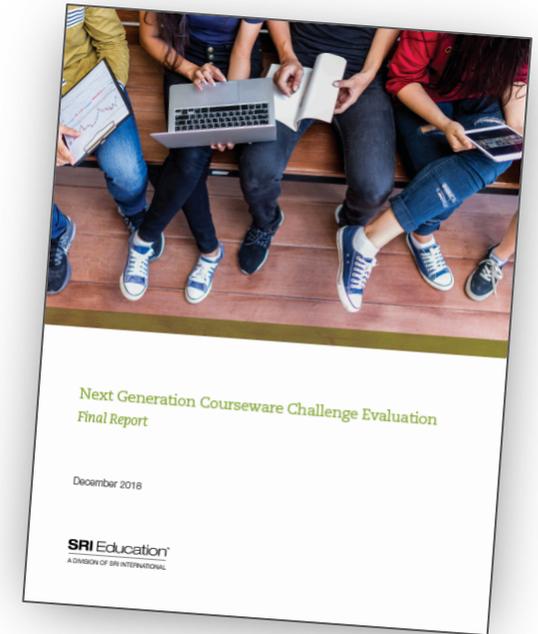


- Next Generation Learning Challenges Wave 1
- Review and Synthesis of Five Years of Funding Digital Courseware
- Evaluation of Next Generation Courseware Challenge

* Performed while at SRI International

Next Generation Courseware Evaluation

- Over 138,000 students in 449 higher education institutions experienced one of 7 adaptive courseware products:
 - Acrobatiq
 - Cerego
 - Cogbooks
 - Lumen Learning
 - Open Stax
 - Smart Sparrow
 - Stanford Open Learning Initiative (OLI)
- The project resulted in over 200 implementations in public 2-year colleges and over 130 in public 4-year institutions.
- Students experiencing the courseware were an estimated 30% Pell eligible and 35% under-represented minorities.



Some Next Generation Courseware Evaluation Findings

- Marketing courseware to individual faculty members led to higher user numbers initially, but the difference from institutional scaling strategies disappeared within 3 years.
- Instructors and students like courseware's interactive elements and embedded formative assessments.
- Instructors using NGCC courseware had positive experiences
 - 88% described themselves as Moderately or Highly Satisfied with it.
 - 80% said they would use the product again.
- The average courseware impact on course grade was positive but small.

How do we measure impact?



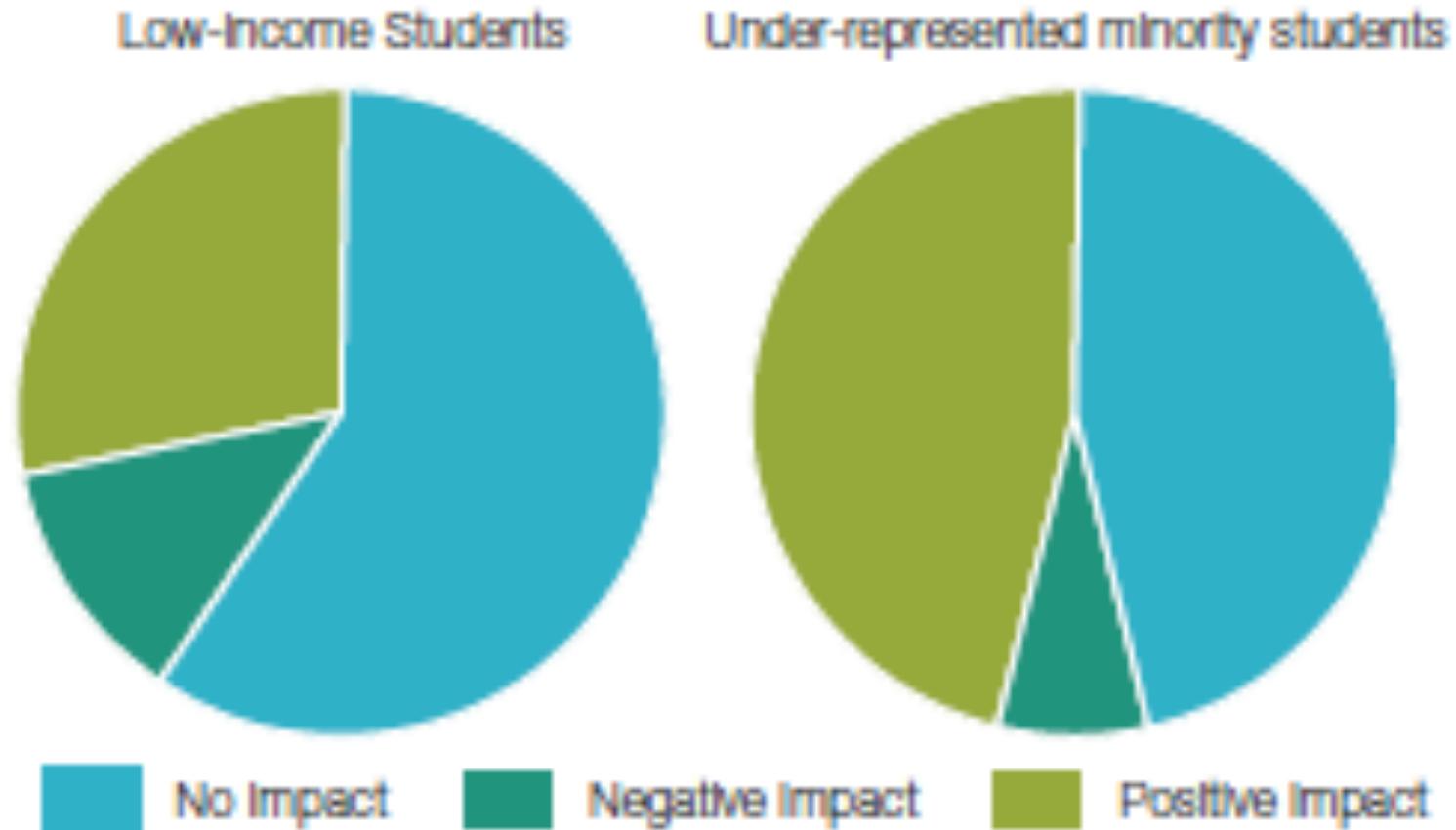
Measuring impact requires . . .

- Objective and consistent measure of the outcome you're trying to impact
- Comparison group to represent what would have happened without the intervention
- Evidence your treatment and comparison groups are comparable
- Adequate numbers in both treatment and comparison groups
- Holding other potential influences on the outcome constant

Some Takeaways from NGCC Impact Analyses

- Impacts varied widely, even for the same courseware product.
- On average, NGCC courseware had a small positive (but statistically significant) impact on course grades.
- The top 25% of implementations had estimated impacts equivalent to 12 percentile points.
- Courseware use did not disadvantage any student group and appeared especially promising for under-represented minority students.
- The best predictor of students' course grade, whether using courseware or not, was prior GPA.
- In the majority of impact analyses (75% or more), grades for students using the courseware were independent of their Pell status, full- or part-time status, age, gender, and first-gen status.

Findings for traditionally vulnerable students



What might contribute to variations in impact?

- Differences among products
- Differences in what's being learned (subject area)
- What the courseware treatment group was compared to
- Instructor differences
- Differences in student characteristics
- Differences in grading practices
- Context (e.g., type of IHE, course subject, modality of instruction)

What might contribute to variations in impact?

- Differences among products **X**
- Differences in what's being learned (subject area) **X**
- What the courseware treatment group was compared to **X**
- Instructor differences
- Differences in student characteristics **X**
- Differences in grading practices
- Context (e.g., type of IHE, course subject, modality of instruction) **X**

Some of these we could control statistically. Some we could document and test as moderators.

What factors were linked to variations in impact?

- On average, the courseware impact estimate was positive for implementations in 4-year institutions and insignificant in 2-year colleges.
- Courseware implementations in biology, psychology, and math/statistics had more positive impacts.
- Positive impacts were found on average when the comparison version of the course was taught face-to-face but not when it was the same modality as the treatment (courseware) condition.
- Impact studies in which courseware-using sections were taught by full-time teachers had positive impacts while those with part-time teachers did not.
- Impacts were more positive when the comparison version of the course had instructors teaching more than 50 teachers.

Data sets submitted by NGCC projects

- **77** impact data sets (a courseware implementation at a particular IHE in a particular term) were submitted to SRI.
- Of these, **32** had to be eliminated because of inadequate sample size (< 30 students per condition).
- **8** data sets were eliminated because of a serious confound in the study design.
- **9** data sets had to be eliminated because of lack of baseline equivalence of students in the two conditions.
- **28** data sets had adequate numbers of students who were reasonably comparable in the two conditions.

Things we learned about doing this kind of work

- You can't expect busy technology developers, marketers, or faculty to design and execute rigorous impact studies without considerable help.
- The more links in the communication chain, the more likely misunderstandings about study design and data requirements will result.
- Comparison groups and data sources need to be planned in advance if you want to get an apples-to-apples comparison of different versions of a course.
- Strong traditions of faculty independence around learning goals, instructional approach, assessment and grading practices impede efforts to learn what works best for student learning.
- Anticipated large data sets often become small if you're interested in impacts for specific subgroups and want to control student background variables.

Digital Promise Is Working as an Improvement Partner for Every Learner



Barbara Means



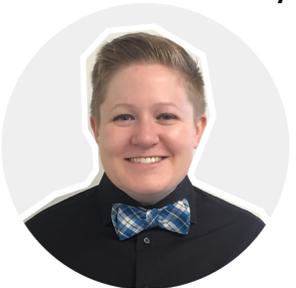
Vanessa Peters



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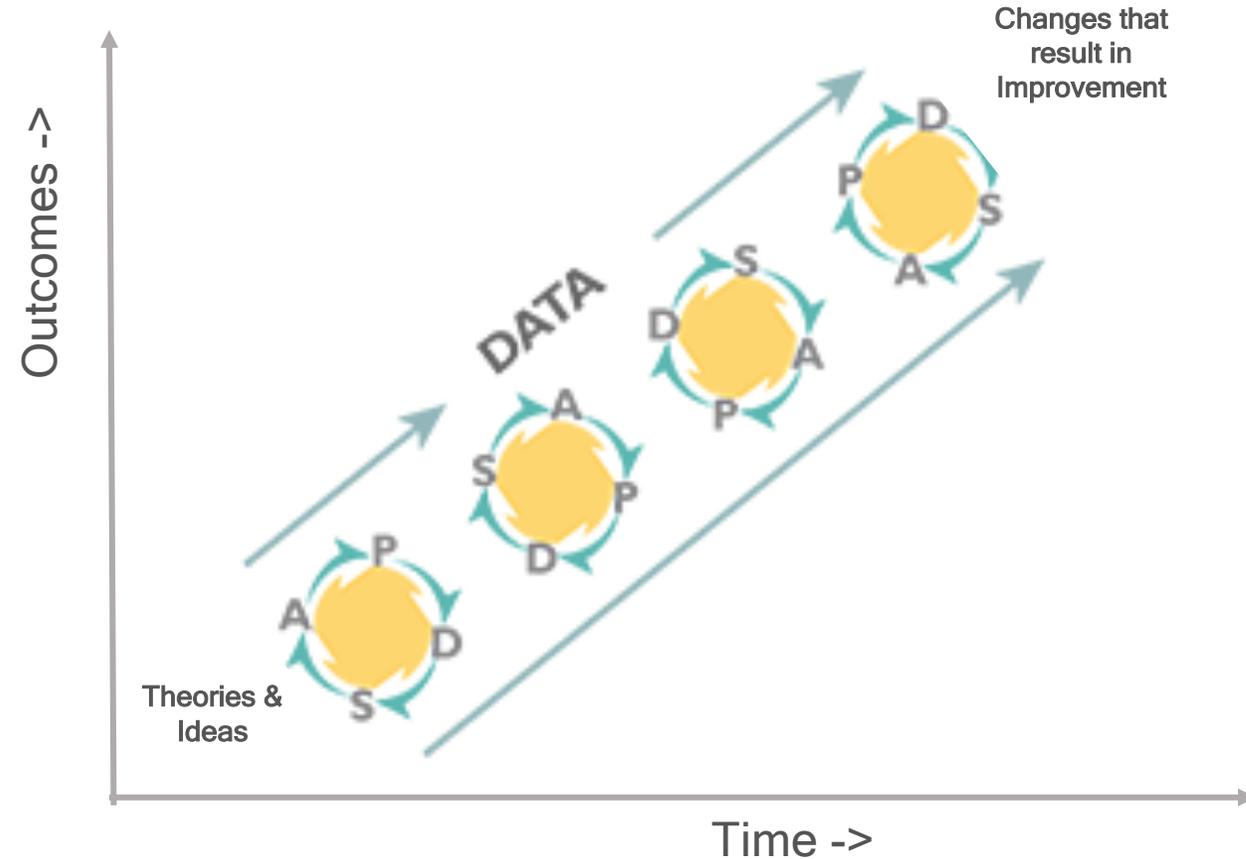
Julie Neisler



Rebecca Griffiths

- Our goal is to help you be successful in improving course outcomes for your students.
- Our researchers can help you:
 - Use data to determine what courses are the best prospects for redesign/ improvement
 - Incorporate learning sciences research into the course redesign process
 - Set up embedded data collections to help you see whether your modifications are having positive effects
 - Collaborate to conduct publishable research documenting the efficacy of your redesigned courses involving digital learning
 - Work with you to measure the cost effectiveness of your course redesign efforts

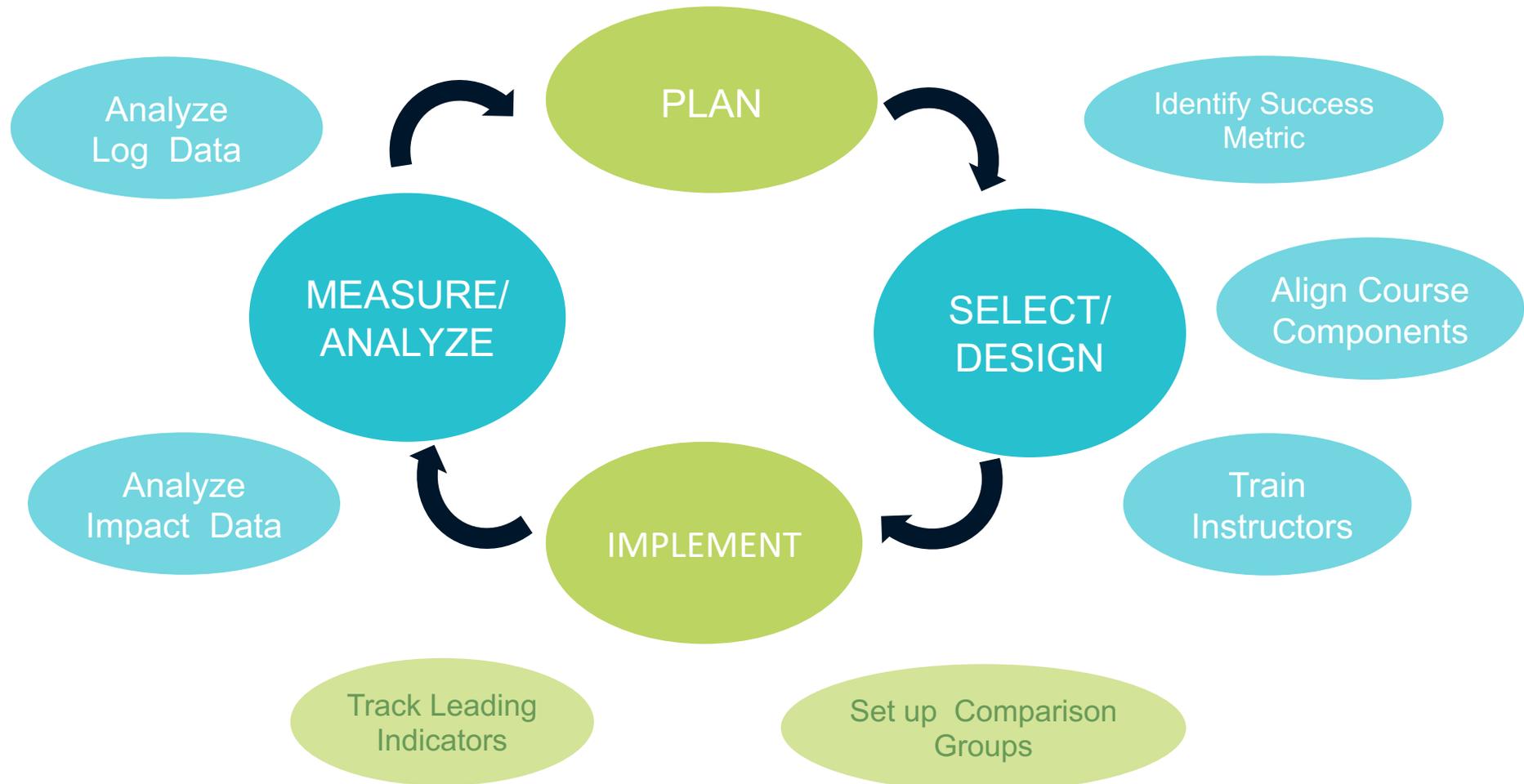
Iterating for Improvement



See also Atul Gawande's New Yorker article

<https://www.newyorker.com/magazine/2004/12/06/the-bell-curve>

Improvement science tells us implementation & evidence collection need to go hand in hand



COURSEWARE IMPLEMENTATION GUIDE + EVIDENCE

APLU Guide Phases



Evidence Use & Generation



Associated Tools/Forms

