Beyond “No Significant Difference”: A Reckoning with Race, Affluence, and Online Learning

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THE NO SIGNIFICANT DIFFERENCE PHENOMENON

This website has been designed to serve as a companion piece to Thomas L. Russell's book, "The No Significant Difference Phenomenon" (2001, IDECC, fifth edition). Mr. Russell's book is a fully indexed, comprehensive research bibliography of 355 research reports, summaries and papers that document no significant differences (NSD) in student outcomes between alternate modes of education delivery, with a foreword by Dr. Richard E. Clark. Previous editions of the book were provided electronically; the fifth edition is the first hardcopy edition. The website will include the full text of the book's bibliography.

This site is intended to function as an ever-growing repository of comparative media studies in education research. Both no significant difference researchers and non-experts are invited to contribute articles, summaries, and other resources.

About the Author

Thomas L. Russell
Emeritus, North Carolina State University

The NSD research was originated and is still edited by Thomas R. Russell.

Read Full Bio
Student Enrollment Patterns and Achievement in Ohio’s Online Charter Schools

June Ahn¹,* and Andrew McEachin²,*

We utilize state data of nearly 1.7 million students in Ohio to study a specific sector of online education: K–12 schools that deliver most, if not all, education online, lack a brick-and-mortar presence, and enroll students full-time. First, we explore e-school enrollment patterns and how these patterns vary by student subgroups and geography. Second, we evaluate the impact of e-schools on students’ learning, comparing student outcomes in e-schools to outcomes in two other schooling types, traditional charter schools and traditional public schools. Our results show that students and families appear to self-segregate in stark ways where low-income, lower achieving White students are more likely to choose e-schools while low-income, lower achieving minority students are more likely to opt into the traditional charter school sector. Our results also show that students in e-schools are performing worse on standardized assessments than their peers in traditional charter and traditional public schools. We close with policy recommendations and areas for future research.

Keywords: achievement; computers and learning; econometric analysis; educational policy; regression analyses; technology

In the history of educational technology research, it is well established that technology as a delivery mechanism (e.g., whether something is online or face-to-face) has no direct impact on student learning outcomes (Bernard et al., 2004; Clark,
Stylized Fact; Heuristic

“No Significant Difference Between F2F and Online Learning”

In the history of educational technology research, it is well established that technology as a delivery mechanism (e.g., whether something is online or face-to-face) has no direct impact on student learning outcomes (Bernard et al., 2004; Clark,

• A starting point for policymakers, researchers, and administrators
• A guide to the boundaries of acceptable discourse, researcher, etc.
• A first-pass, short-hand understanding for non-specialists
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This site is intended to function as an ever-growing repository of comparative media studies in education research. Both no significant difference phenomena and factors contributing to its occurrence are covered.
Reconsidering Research on Learning from Media

Richard E. Clark
University of Southern California

Abstract. Recent meta-analyses and other studies of media's influence on learning are reviewed. Consistent evidence is found for the generalization that there are no learning benefits to be gained from employing any specific medium to deliver instruction. Research showing performance or time-saving gains from one or another medium are shown to be vulnerable to compelling rival hypotheses concerning the uncontrolled effects of instructional method and novelty. Problems with current media attribute and symbol system theories are described and suggestions made for more promising research directions.

However, this article will argue that most current summaries and meta-analyses of media comparison studies clearly suggest that media do not influence learning under any conditions. Even in the few cases where dramatic changes in achievement or ability have followed the introduction of a medium, as was the case with television in El Salvador (Schramm, 1977), it was not the medium that caused the change but rather a curricular reform that accompanied the change. The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition. Basically, the choice of vehicle might influence the cost or extent of distributing instruction, but only the content of the vehicle can influence achievement. While research often shows a slight learning advantage for newer media over more conventional instructional vehicles, this advantage will be

• All media are the same; so just study instructional practices within media

A Research Caution

Based on this consistent evidence, it seems reasonable to advise strongly against future media comparison research. Five decades of research suggest that there are no learning benefits to be gained from employing different media in instruction, regardless of their obviously attractive features or advertised superiority. All existing surveys of this research indicate that confounding has contributed to the studies attributing learning benefits to one medium over another and that the great majority of these comparison studies clearly indicate no significant differences.

Summary

It seems reasonable to assume, therefore, that media are delivery vehicles for instruction and do not directly influence learning. However, certain elements of different media, such as animated motion or zooming, might serve as sufficient conditions to facilitate the learning of students who lack the skill being modeled. Symbolic elements such as zooming are not media (we can have a film or television program which does not contain zooming) but allow us to create sufficient conditions to teach required cognitive skills. The determination of necessary conditions is a fruitful approach when analyzing all instructional problems, and it is the foundation of all instructional theories. Once described, the necessary cognitive operation is a specification or recipe for an instructional method.
How Does Distance Education Compare to Classroom Instruction?
A Meta-Analysis of the Empirical Literature

Abstract
A meta-analysis of the distance education (DE) literature between 1985 and 2002 was conducted that addressed the following questions: a) Overall, is interactive DE as effective, in terms of student achievement, student attitudes and retention as its classroom-based counterparts? b) What is the nature and extent of the variability of the findings? c) What conditions contribute to more effective DE as compared to classroom instruction? d) How do conditions of synchronous and asynchronous DE moderate the overall results? e) To what extent do media features and pedagogical features moderate the influences of DE on student learning? f) What is the methodological state of the literature? and g) what are important implications for practice and future directions for research? In total, 232 studies containing 599 independent achievement, attitude and retention outcomes were analyzed.

Robert M. Bernard, Philip C.Abrami, Yiping Lou¹, Evgueni Borokhovski, Anne Wade, Lori Wozney, Peter Andrew Wallet, Manon Fiset and Binru Huang¹

• Quality of studies?
• Do they evaluate variation by student characteristics—race, prior achievement, affluence, etc.?
Means et al (2010)

The narrative review of experimental and quasi-experimental studies contrasting different online learning practices found that the majority of available studies suggest the following:

- *Blended and purely online learning conditions implemented within a single study generally result in similar student learning outcomes.* When a study contrasts blended and purely online conditions, student learning is usually comparable across the two conditions.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Effect Size</th>
<th>95 Percent Confidence Interval</th>
<th>Test of Null Hypothesis (2-tail)</th>
<th>Retention Rate (percentage)</th>
<th>Number of Units Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beeckman et al. (2008)</td>
<td>Pressure ulcers: E-learning to improve classification by nurses and nursing students</td>
<td>+0.294</td>
<td>0.097</td>
<td>0.104 to 0.484</td>
<td>3.03**</td>
<td>Unknown 100, 100</td>
</tr>
<tr>
<td>Bello et al. (2005)</td>
<td>Online vs. live methods for teaching difficult airway management to anesthesia residents</td>
<td>+0.278</td>
<td>0.265</td>
<td>-0.241 to 0.797</td>
<td>1.05</td>
<td>100, 100</td>
</tr>
<tr>
<td>Benjamin et al. (2007)</td>
<td>A randomized controlled trial comparing Web to in-person training for child care health consultants</td>
<td>+0.046</td>
<td>0.340</td>
<td>-0.620 to 0.713</td>
<td>0.14</td>
<td>Unknown 100, 100</td>
</tr>
<tr>
<td>Beyea et al. (2008)</td>
<td>Evaluation of a particle repositioning maneuver Web-based teaching module</td>
<td>+0.790</td>
<td>0.493</td>
<td>-0.176 to 1.756</td>
<td>1.60</td>
<td>Unknown, 20</td>
</tr>
<tr>
<td>Caldwell (2006)</td>
<td>A comparative study of traditional, Web-based and online instructional modalities in a computer programming course</td>
<td>+0.132</td>
<td>0.310</td>
<td>-0.476 to 0.740</td>
<td>0.43</td>
<td>100, 100</td>
</tr>
<tr>
<td>Cavus, Uzonboylu and Ibrahim (2007)</td>
<td>Assessing the success rate of students using a learning management system together with a collaborative tool in Web-based teaching of programming languages</td>
<td>+0.466</td>
<td>0.335</td>
<td>-0.190 to 1.122</td>
<td>1.39</td>
<td>Unknown 100, 100</td>
</tr>
<tr>
<td>Davis et al. (1999)</td>
<td>Developing online courses: A comparison of Web-based instruction with traditional instruction</td>
<td>-0.379</td>
<td>0.339</td>
<td>-1.042 to 0.285</td>
<td>-1.12</td>
<td>Unknown, 20</td>
</tr>
<tr>
<td>Hairston (2007)</td>
<td>Employees’ attitudes toward e-learning: Implications for policy in industry environments</td>
<td>+0.028</td>
<td>0.155</td>
<td>-0.275 to 0.331</td>
<td>0.18</td>
<td>70, 58.33</td>
</tr>
<tr>
<td>Harris et al. (2008)</td>
<td>Educating generalist physicians about chronic pain with live experts and online education</td>
<td>-0.285</td>
<td>0.252</td>
<td>-0.779 to 0.209</td>
<td>-1.13</td>
<td>84.21, 94.44</td>
</tr>
<tr>
<td>Hugenholtz et al. (2008)</td>
<td>Effectiveness of e-learning in continuing medical education for occupational physicians</td>
<td>+0.106</td>
<td>0.233</td>
<td>-0.351 to 0.564</td>
<td>0.46</td>
<td>Unknown, 72</td>
</tr>
<tr>
<td>Jang et al. (2005)</td>
<td>Effects of a Web-based teaching method on undergraduate nursing students’ learning of electrocardiography</td>
<td>-0.530</td>
<td>0.197</td>
<td>-0.917 to -0.143</td>
<td>-2.69**</td>
<td>85.71, 87.93</td>
</tr>
</tbody>
</table>
No Significant Difference

OR

Blended Is a Bit Better
The First and Second Digital Divides

Paul Attewell
Graduate Center, City University of New York

Access: majority race and affluent learners are more likely to have opportunities to use digital tools.

Usage: Majority race and affluent learners are more likely to use technology for creative purposes (versus drill and practice), and with more adult mentorship and support.
Fig. 1. National course completion rate in 55 MOOCs as a function of the Human Development Index. Each point represents a country with size proportionate to the number of learners (points with $n<100$ excluded). A weighted best-fit line is shown.

**POLICY FORUM**

**EDUCATION**

**Closing global achievement gaps in MOOCs**

Brief interventions address social identity threat at scale

*By Ronald F. Kister, Andrew J. Saltarelili, Justin Reilk, Geoffrey L. Cohen*  
*Science* 20 Jan 2017
<table>
<thead>
<tr>
<th>Reference</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard Powell, Christopher Conway, Lynda Ross (1990). <em>Effects of Student Predisposing Characteristics on Student Success</em>. <em>International Journal of E-Learning and Distance Education</em>. 5(1), 5-19</td>
<td>For 243 students at Athabasca University in Canada, the researchers measured persistence (self-reported Likert scale &amp; fail/withdrawal/pass status), marital status, need for success, need for support, test, literacy, financial stability, study habits, gender, education level, and subjective ratings of their education. They performed a Discriminant Analysis to predict whether students would fail/withdraw or pass. They found educational level did not help to discriminate between the pass and fail/withdraw group.</td>
</tr>
<tr>
<td></td>
<td>“Interestingly, the level of previous educational experience, although measured in the study, did not enter the model as a significant predictive factor, while students' subjective ratings of their educational experience did. This suggests that formal educational qualifications may not be as accurate a measure of preparedness for distance education study as many would argue. (This is not to suggest that no correlation existed between previous educational background and success - it did - but that other measures, associated with previous educational background, were better predictors.)”</td>
</tr>
<tr>
<td></td>
<td>“However, most of the findings of this study were similar to previous research which was done in other countries. For example, the academic outcome of nontraditional students was neither related to secondary school achievement scores nor to previous participation in a higher education program. Similar results were found by McLaughlin (1973) and Kennedy and Powell (1976).” (p. 7)</td>
</tr>
<tr>
<td></td>
<td>“The relationship between formal educational background and tertiary performance of mature distance education students is therefore more tenuous even than for direct entrants from school. Educational background is however included in the characteristics component of the model. It is present because educational background can influence other components of the linear model, rather than for any direct relationship with drop-out. For this reason, cases related to educational background are not cited in this section of the paper. Rather they are presented in the section on academic integration, and show how academic background influences the integration process.” p 201</td>
</tr>
</tbody>
</table>
Experimental Evidence
This article presents the first experimental evidence on the effects of live versus Internet media of instruction. Students in a large introductory microeconomics course at a major research university were randomly assigned to live lectures versus watching these same lectures in an Internet setting where all other factors (e.g., instruction, supplemental materials) were the same. We find modest evidence that live-only instruction dominates Internet instruction. These results are particularly strong for Hispanic students, male students, and lower-achieving students. We also provide suggestions for future experimentation in other settings.
Table 4: Heterogeneous Effects of Live Instruction Versus Online Instruction

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Results by racial/ethnic group</th>
<th>Results by student sex</th>
<th>Results by achievement level</th>
</tr>
</thead>
<tbody>
<tr>
<td>White students</td>
<td>1.117</td>
<td>(1.436)</td>
<td></td>
</tr>
<tr>
<td>Black students</td>
<td>2.828</td>
<td>(3.239)</td>
<td></td>
</tr>
<tr>
<td>Hispanic students</td>
<td>11.276**</td>
<td>(3.587)</td>
<td></td>
</tr>
<tr>
<td>Asian students</td>
<td>4.319</td>
<td>(3.590)</td>
<td></td>
</tr>
<tr>
<td>Male students</td>
<td></td>
<td>3.480**</td>
<td>(1.680)</td>
</tr>
<tr>
<td>Female students</td>
<td></td>
<td>1.780</td>
<td>(1.576)</td>
</tr>
<tr>
<td>Low-achievers</td>
<td></td>
<td></td>
<td>4.054***</td>
</tr>
<tr>
<td>High-achievers</td>
<td></td>
<td></td>
<td>(1.536)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.386</td>
<td>0.370</td>
<td>0.402</td>
</tr>
</tbody>
</table>

Notes: Dependent variable is the average test score measured on a 0-to-100 point scale. Number of observations: 296. Standard errors are in parentheses beneath coefficient estimates. Differences marked ***, ** and * are statistically significant at the 1, 5 and 10 percent levels, respectively.
The Struggle to Pass Algebra: Online vs. Face-to-Face Credit Recovery for At-Risk Urban Students

Jessica B. Heppen\textsuperscript{a}, Nicholas Sorensen\textsuperscript{a}, Elaine Allensworth\textsuperscript{b}, Kirk Wa
Jordan Rickles\textsuperscript{a}, Suzanne Stachel Taylor\textsuperscript{a}, and Valerie Michelman\textsuperscript{b}

**ABSTRACT**

Students who fail algebra are significantly less likely to graduate on time, and algebra failure rates are consistently high in urban districts. Identifying effective credit recovery strategies is critical for getting students back on track. Online courses are now widely used for credit recovery, yet there is no rigorous evidence about the relative efficacy of online versus face-to-face credit recovery courses. To address this gap, this study randomly assigned 1,224 ninth graders who failed algebra in 17 Chicago public high schools to take an online or face-to-face algebra credit recovery course. Compared to students in face-to-face credit recovery, students in online credit recovery reported that the course was more difficult, were less likely to recover credit, and scored lower on an algebra posttest. There were no statistically significant differences by condition on any outcomes measured during the second year of high school (standardized mathematics test and algebra subtest scores, likelihood of passing subsequent math classes, cumulative math credits, or on-track rates). The benefits and challenges of online learning for credit recovery are discussed in light of the findings to date.

**Figure 2.** Summer session course grades and credit recovery rates by condition. Figure shows the percent of students in each condition who earned grades of A, B, C, D, F, or no grade in the credit recovery course to which they were randomly assigned as part of the study. Students who received no grade had dropped the course before completion. Group percentages are observed, not model-adjusted. Sample sizes are $n = 611$ for face-to-face (F2F) students; $n = 613$ online students.
Large Field Evaluations
Promises and pitfalls of online education

Eric Bettinger and Susanna Loeb

Executive Summary

Online courses have expanded rapidly and have the potential to extend further the educational opportunities of many students, particularly those least well-served by traditional educational institutions. However, in their current design, online courses are difficult, especially for the students who are least prepared. These students’ learning and persistence outcomes are worse when they take online courses than they would have been had these same students taken in-person courses. Continued improvement of online curricula and instruction can strengthen the quality of these courses and hence the educational opportunities for the most in-need populations.
We also find that taking a course online, instead of in person, increases the probability that a student will drop out of school. In the semester after taking an online course, students are about 9 percentage points less likely to remain enrolled. This reduction is relative to an average of 88 percent of students remaining enrolled in the following term. Moreover, taking a course online reduces the number of credits that students who do reenroll take in future semesters. While this setting is quite different, we can compare the effects on online course taking to other estimates of effects of on college persistence. For example, the literature on financial aid often finds that $1000 in financial aid increases persistence rates by about three percentage points and college mentorship increases persistence rates by five percentage points.
Performance Gaps Between Online and Face-to-Face Courses: Differences Across Types of Students and Academic Subject Areas

Using a dataset containing nearly 500,000 courses taken by over 40,000 community and technical college students in Washington State, this study examines the performance gap between online and face-to-face courses and how the size of that gap differs across student subgroups and academic subject areas. While all types of students in the study suffered decrements in performance in online courses, those with the strongest declines were males, younger students, Black students, and students with lower grade point averages. Online performance gaps were also wider in some academic subject areas than others. After controlling for individual and peer effects, the social sciences and the applied professions (e.g., business, law, and nursing) showed the strongest online performance gaps.
Moving the classroom to the computer lab: Can online learning with in-person support improve outcomes in community colleges?

Colleges are experimenting with integrating technology into the classroom to improve student learning and reduce costs. While fully online models appear to have negative effects on student learning compared to in-person instruction, there is less evidence about models that blend elements of online and in-person instruction. In this study, I estimate the effect of adopting a blended approach to teaching called the emporium model in which students complete online work in an on-campus lab with instructors onsite to assist. Using a triple difference identification strategy, I find that using the emporium model compared to traditional instruction in remedial math courses in a state community college system reduces course pass rates, retention, and degree attainment. Effects were generally consistent across all three levels of remediation, suggesting there was little variation by students’ incoming placement test score.

Whitney Kozakowski @WhitneyKoz · May 14
Compared to traditional instruction, students taught using the emporium model are 10 pp less likely to pass their courses and 6 pp less likely to be enrolled by the following year. Within 3 years, there’s a 4 pp reduction in associate degree attainment.
Student Enrollment Patterns and Achievement in Ohio’s Online Charter Schools

June Ahn¹,* and Andrew McEachin²,*

We utilize state data of nearly 1.7 million students in Ohio to study a specific sector of online education: K–12 schools that deliver most, if not all, education online, lack a brick-and-mortar presence, and enroll students full-time. First, we explore e-school enrollment patterns and how these patterns vary by student subgroups and geography. Second, we evaluate the impact of e-schools on students’ learning, comparing student outcomes in e-schools to outcomes in two other schooling types, traditional charter schools and traditional public schools. Our results show that students and families appear to self-segregate in stark ways where low-income, lower achieving White students are more likely to choose e-schools while low-income, lower achieving minority students are more likely to opt into the traditional charter school sector. Our results also show that students in e-schools are performing worse on standardized assessments than their peers in traditional charter and traditional public schools. We close with policy recommendations and areas for future research.

Keywords: achievement; computers and learning; econometric analysis; educational policy; regression analyses; technology

¹*Corresponding author. E-mail address: jahn@osu.edu (June Ahn).
²*Corresponding author. E-mail address: mceachin@ohio.edu (Andrew McEachin).
### Table 8
Marginal Effects of E-Schools and Charter Schools on Ohio Students Achievement by Students’ Prior Achievement Tertiles

<table>
<thead>
<tr>
<th>E-school</th>
<th>Elementary and Middle School</th>
<th></th>
<th>High School</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math</td>
<td>Reading</td>
<td>Math</td>
<td>Reading</td>
<td>Science</td>
</tr>
<tr>
<td>First tertile (low achievers)</td>
<td>-0.405***</td>
<td>-0.255***</td>
<td>-0.142***</td>
<td>-0.057***</td>
<td>-0.130***</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.014)</td>
<td>(0.019)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Second tertile</td>
<td>-0.360***</td>
<td>-0.144***</td>
<td>-0.233***</td>
<td>-0.099***</td>
<td>-0.188***</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.008)</td>
<td>(0.029)</td>
<td>(0.020)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Third tertile (high achievers)</td>
<td>-0.302***</td>
<td>-0.103***</td>
<td>-0.105*</td>
<td>-0.092***</td>
<td>-0.081*</td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
<td>(0.013)</td>
<td>(0.049)</td>
<td>(0.023)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>Charter school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First tertile (low achievers)</td>
<td>0.048***</td>
<td>0.030***</td>
<td>0.003</td>
<td>-0.063*</td>
<td>0.048*</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.010)</td>
<td>(0.026)</td>
<td>(0.028)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>Second tertile</td>
<td>0.033**</td>
<td>0.04***</td>
<td>-0.004</td>
<td>-0.019</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.008)</td>
<td>(0.032)</td>
<td>(0.034)</td>
<td>(0.036)</td>
</tr>
<tr>
<td>Third tertile (high achievers)</td>
<td>0.038*</td>
<td>0.059***</td>
<td>0.018</td>
<td>0.002</td>
<td>0.100*</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.012)</td>
<td>(0.039)</td>
<td>(0.050)</td>
<td>(0.042)</td>
</tr>
</tbody>
</table>

*Note.* Coefficients represent the marginal effect of a given tertile of prior achievement and school type on students’ achievement. For example, each cell represents the achievement differences between an e-school or charter student in a given tertile of the prior achievement distribution and a student in the same tertile in a traditional public school. Models includes students’ prior school fixed effects and the same controls as Table 6. Standard errors are in parentheses and clustered at the school level. *p < .10. *p < .05. **p < .01. ***p < .001.
Understanding these details of context and pedagogy have substantial implications for how one interprets the outcomes of K–12 online schooling and the policy implications we derive. One potential but simplistic interpretation is that online schools are unequivocally negative for K–12 learners and policy should deter these school forms. A more nuanced understanding is that online schools—in its current form as a largely independent learning experience—are not effective for K–12 learners. Instead, learners still need the presence of teachers, mentors, or peers to help them through the learning process. This interpretation instead suggests different policy implications. States will need to pay more attention to how school choice policies influence the supply and provision of online schools to encourage certain student populations to enroll. In addition, online curriculum might be designed and employed to efficiently deliver content but combined with new ways of distributing human support (e.g.,

In the history of educational technology research, it is well established that technology as a delivery mechanism (e.g., whether something is online or face-to-face) has no direct impact on student learning outcomes (Bernard et al., 2004; Clark, 1983; Fishman et al., 2013). What really matters is understanding how the introduction of technology impacts who chooses to participate in particular learning environments and what they experience that result in learning outcomes. As researchers strive to understand how online learning could be employed to improve student outcomes, there is a great need for research to contextualize findings and better articulate how online education is implemented in various ways, how policies shape what types of learners experience online learning, and importantly how online learning may likely have differential effects for students who have diverse academic needs and histories.
Differences in Online Comparison Studies, from the “No Significant Difference” era to now

• Stronger emphasis on rigorous causal methods, sufficient power, etc.
• Older studies were “hothouses”; newer studies more likely to be in more authentic settings
• Older studies were too small to allow examination of sub-populations; new studies examine a variety of vulnerable groups
• Older studies are short term with bespoke measures; newer studies examine long term outcomes like subsequent course grades and graduation

“No Significant Differences” as a canonical position or stylized fact emerged from a research base that did not attend to race, socio-economic status or prior achievement.
Online Courses Are Harming the Students Who Need the Most Help

But in high schools and colleges, there is mounting evidence that the growth of online education is hurting a critical group: the less proficient students who are precisely those most in need of skilled classroom teachers.
Possible Causes

• Selection effects--Learners who select in or are placed in online learning are often vulnerable to begin with
• Learners who select in or are placed in online learning lack the self-regulated learning skills to engage in self-paced, low-contact learning environments
• Services provisioned to vulnerable learners are worse than “comparable” services provisioned to affluent learners
Old Stylized Fact- NSD or Blended is a Bit Better

In the history of educational technology research, it is well established that technology as a delivery mechanism (e.g., whether something is online or face-to-face) has no direct impact on student learning outcomes (Bernard et al., 2004; Clark, ...

New Stylized Fact- Online Learning is a “Risk Factor” for Vulnerable Students

Serious caution should be exercised when offering online learning to vulnerable learners because outcomes are usually worse than in face to face settings.

In real-world settings where students from vulnerable groups—racially minorities, students from poverty-impacted neighborhoods, or students with low scores on achievement measures—select into or are assigned to online learning environments with similar content to face-to-face courses but reduced human contact, those vulnerable students are at serious risk of having a worse learning experience and worse performance.
FROM GOOD INTENTIONS TO REAL OUTCOMES
EQUITY BY DESIGN IN LEARNING TECHNOLOGIES

The Digital Media + Learning Research Hub
Report Series on Connected Learning

Written by:
Justin Reich
Mizuko Ito
Design Principles for Digital Equity

Use evidence to subvert people’s intuition about the EdTech Matthew Effect

Address psychological barriers affecting vulnerable learners

Leverage student interest as entry points into learning

Provide human supports to targeted students, their families, and communities

Serve those who serve others

Address cost barriers that most afflict low-income families