
Thank you for your request to our REL Reference Desk regarding research on the effects of blended and online learning on student achievement. Ask A REL is a collaborative reference desk service provided by the ten regional educational laboratories (REL) that, by design, functions much in the same way as a technical reference library. It provides references, referrals, and brief responses in the form of citations on research based education questions.

The information below represents the most rigorous research available. Researchers consider the type of methodology and give priority to research reports that employ well described and thorough methods. The resources were also selected based on the date of the publication with a preference for research from the last ten years. Additional criteria for inclusion include the source and funder of the resource.

Question: *How does the Blended and Online Learning model have a direct effect on students' academic achievement within the district and/or state in comparison to instruction in a traditional learning environment?*

Key words and search strings used in the search: *blended online learning AND traditional AND academic achievement; blended AND traditional AND academic achievement; online learning AND traditional AND academic achievement*

Search databases and websites:

1. ERIC: <http://eric.ed.gov/>
2. JSTOR: <http://www.jstor.org/action/showAdvancedSearch>
3. Google Scholar: www.google.com/scholar
4. Institute of Education Sciences (IES) Resources: <http://ies.ed.gov/pubsearch/>
5. What Works Clearinghouse: <http://ies.ed.gov/ncee/wwc/>

Citations Retrieved: (NOTE: Abstracts and executive summaries are copied directly from the reports when possible to ensure accuracy):

Some related research citations are provided below:

Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2014). Interactive learning online at public universities: Evidence from a six-campus randomized trial. *Journal of Policy Analysis and Management*, 33(1), 94-111. <http://eric.ed.gov/?id=EJ1027704>

Online instruction is quickly gaining in importance in U.S. higher education, but little rigorous evidence exists as to its effect on student learning. We measure the effect on learning outcomes of a prototypical interactive learning online statistics course by randomly assigning students on six public university campuses to take the course in a hybrid format (with machine-guided instruction accompanied by one hour of face-to-face instruction each week) or a traditional format (as it is

usually offered by their campus, typically with about three hours of face-to-face instruction each week). We find that learning outcomes are essentially the same—that students in the hybrid format are not harmed by this mode of instruction in terms of pass rates, final exam scores, and performance on a standardized assessment of statistical literacy. We also conduct speculative cost simulations and find that adopting hybrid models of instruction in large introductory courses has the potential to significantly reduce instructor compensation costs in the long run.

Gibson, J. W. (2008). A comparison of student outcomes and student satisfaction in three MBA human resource management classes based on traditional vs. online learning. *Journal of College Teaching & Learning*, 5(8), 1-10. <http://eric.ed.gov/?id=EJ884562>

The author taught three MBA Human Resource Management classes in the spring term of 2007 at a large private university in Florida. Two of the classes were taught in a 100% online format while the third was taught off campus in a university-owned building in Orlando where students met in a face-to-face, weekend setting. This traditional class was augmented by a WebCT classroom where students posted assignments, did exams, and communicated via email and discussion boards in the interims between classes. Comparisons were made regarding student performance and student satisfaction. In both areas, students in the face-to-face class scored just slightly better than their online counterparts. (Contains 3 figures.)

Lewis, S. J., & Harrison, M. A. (2012). Online delivery as a course adjunct promotes active learning and student success. *Teaching of Psychology*, 39(1), 72-76. <http://eric.ed.gov/?id=EJ1004923>

Chickering and Gamson's notable summary of the best practices of undergraduate teaching include promoting active learning, cooperation, and student-faculty contact. The present study hypothesized that online delivery of lecture prior to course meetings allows more in-class time to achieve these goals. Students in a control group received a traditional, oral, lecture-style class with supplementing PowerPoint presentation, whereas students in a treatment group received online presentation of the same lecture script and PowerPoint presentation prior to coming to class; the treatment group's in-class time was devoted to group activities and discussion of material. Learning and retention were assessed by student performance on a series of multiple-choice tests and quizzes given throughout the semester. Results indicate that students in the treatment condition scored significantly higher on most measures than did students in the control condition. Through strong control of experimental conditions, this study departs from many previous investigations of the benefits of online delivery as an adjunct to seated class time in an introductory social science course, highlighting its advantages such as freeing class time for those activities and strategies deemed to be best practices. The implications of these results and limitations to the study are discussed. (Contains 1 table.)

Safar, A. H., & AlKhezzi, F. A. (2013). Beyond computer literacy: Technology integration and curriculum transformation. *College Student Journal*, 47(4), 614-626.
<http://eric.ed.gov/?id=EJ1029288>

Personal computers, the Internet, smartphones, and other forms of information and communication technology (ICT) have changed our world, our job, our personal lives, as well as how we manage our knowledge and time effectively and efficiently. Research findings in the past decades have acknowledged and affirmed that the content the ICT medium carries is as important as the ICT medium itself. These studies also added a third constituent to the structure of ICT usage and integration; that is the pedagogical approach of teaching and learning. One of the modern ICT trends of organizations involves the incorporation and integration of a blended approach of teaching and learning; which combines the traditional face-to-face instructor-led method with ICT-based online teaching and learning environment. This quasi-experimental research study was deployed to evaluate and identify the effect and usefulness of a blended pedagogical approach of teaching and learning on students' academic achievement, motivation, and attitudes. A total of 128 (i.e., 64 experimental group and 64 control group) undergraduate students in the College of Education (COE) at Kuwait University (KU) participated in this study. The results revealed that the students enrolled in the experimental group were significantly outscoring their counterparts in the control group. They submitted projects with better quality; earned higher final grades; attended more online training courses; took more ICDL tests; and the majority attended all classes. These findings imply that the potential of a blended approach of teaching and learning is endless. It can produce robust teaching and learning environments and experiences. It can also reveal that teaching and learning with such method or strategy, while integrating and incorporating ICT tools, can be fun.

What Works Clearinghouse (2014). *WWC review of the report "interactive learning online at public universities: Evidence from a six-campus randomized trial." what works clearinghouse single study review*. Washington, DC: U.S. Department of Education.
<http://eric.ed.gov/?id=ED545123>

The 2013 study, "Interactive Learning Online at Public Universities: Evidence From a Six-Campus Randomized Trial," examined the impact of interactive learning online (ILO) on the pass rates of 605 students enrolled in introductory statistics courses at six public universities. ILO is a form of online course instruction in which computer-guided instruction substitutes for some, though not all, traditional face-to-face instruction. Students learn course material independently and individual student data are used to provide customized instruction. Pass rates in both the intervention and comparison course sections were similar (80% vs. 76%, respectively). The researchers found no statistically significant difference between these rates. This study was well executed and meets What Works Clearinghouse (WWC) group design standards without reservations. Four appendices are included: (1) Study details; (2) Outcome measure for the academic achievement domain; (3) Study findings for the academic

achievement domain; and (4) Supplemental findings for the academic achievement domain. A glossary of terms is also included. [The following study is the focus of this review: Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2013). Interactive learning online at public universities: Evidence from a six-campus randomized trial. "Journal of Policy Analysis and Management," 33(1), 94-111.]

Xu, Y. J., Meyer, K. A., & Morgan, D. (2008). Piloting a blended approach to teaching statistics in a college of education: Lessons learned. *Journal of Educators Online*, 5(2), 20.
<http://eric.ed.gov/?id=EJ904046>

This study investigated the performance of graduate students enrolled in introductory statistics courses. The course in fall 2005 was delivered in a traditional face-to-face manner and the same course in fall 2006 was blended by using an online commercial tutoring system (ALEKS) and making attendance of several face-to-face classes optional. There was no significant difference in the t-test comparing performance in the courses, which used the students' combined score on two mid-terms and the final exam to indicate performance. The ANCOVA analyzing influences on performance in the blended class yielded no significant influence for gender, ethnicity, age, or class type (traditional vs. blended), but a significant influence from students' incoming GRE-Quantitative score. Seven Likert questions on students' perception of blended learning were not correlated with student performance. Three focus groups--comprised of low-, medium-, and high-performing students--revealed three themes and several subthemes and differences based on students' performance level. (Contains 4 tables.)

Referrals

Federally Funded Resources:

- Institute of Education Sciences (IES), public search engine available at: <http://ies.ed.gov/pubsearch/>
- What Works Clearinghouse: <http://ies.ed.gov/ncee/wwc/>

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