

Research on the Effectiveness of Online Learning

A Compilation of Research on Online Learning

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The Future
of State Universities

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Learning Outcomes

Comparative research on learning outcomes in distance education versus face-to-face instructional settings has a long history, reaching back to the 1920s. The findings of hundreds, perhaps thousands of studies, over the decades and through the 1990s have been consistent - there are no significant differences in learning outcomes achieved by students engaged in face-to-face instruction compared to those participating in distance education. This holds true regardless of the technology medium used, the discipline, or the type of student. Beginning around 2000, several studies, including meta-studies (review and analysis of hundreds of studies selected for their rigor), began to find significant differences in favor of online learning. These studies culminated in 2010 with a report from the U.S. Department of Education “Meta-Analysis and Review of Online Learning Studies.”

U.S. Department of Education. (2010). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.

<http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>

“A systematic search of the research literature from 1996 through July 2008 identified more than a thousand empirical studies of online learning. Analysts screened these studies to find those that a) contrasted an online to a face-to-face condition, b) measured student learning outcomes, c) used a rigorous research design, and d) provided adequate information to calculate an effect size.”

“Earlier studies of distance learning concluded that these technologies were not significantly different from regular classroom learning in terms of effectiveness. Policymakers reasoned that if online instruction is no worse than traditional instruction in terms of student outcomes, then online education initiatives could be justified on the basis of cost efficiency or need to provide access to learners in settings where face-to-face instruction is not feasible.”

Moreover, with the advances in Web-based and collaborative technologies which are a “far cry” from earlier distance education applications, “Policy-makers and practitioners want to know about the effectiveness of Internet-based, interactive online learning approaches and need information about the conditions under which online learning is effective.”

Key findings:

- Students who took all or part of their course online performed better, on average, than those taking the same course through traditional face-to-face instruction.
- Effect sizes were larger for studies in which the online instruction was collaborative or instructor-directed than in those studies where online learners worked independently.

- Most of the variations in the way in which different studies implemented online learning did not affect student learning outcomes significantly.
- The effectiveness of online learning approaches appears quite broad across different content and learner types.

A further review of experimental and quasi-experimental studies that contrasted different types of online learning practices found the following:

- When a study contrasts blended and purely online conditions, student learning is usually comparable across the two.
- Elements such as video or online quizzes do not appear to influence the amount that students learn in online classes.
- Online learning can be enhanced by giving learners control of their interactions with media and prompting learner reflection.
- When groups of students are learning together online, support mechanisms such as guiding questions generally influence the way students interact, but not the amount they learn.

Shachar M., & Neumann, Y., (2010). Twenty Years of Research on the Academic Performance Differences Between Traditional and Distance Learning: Summative Meta-Analysis and Trend Examination, *MERLOT Journal of Online Learning and Teaching*, Vol. 6, No. 2. http://jolt.merlot.org/vol6no2/shachar_0610.pdf

“This meta-analysis research estimated and compared the differences between the academic performance of students enrolled in distance education courses, relative to those enrolled in traditional settings, as demonstrated by their final course grades/scores, within the last twenty year (1990-2009) period, further broken down to four distinct sub-periods.”

A large k-125 of experimental and quasi-experimental studies met the established inclusion criteria for the meta-analysis (including data from over 20,000 participating students), and provided effect sizes, clearly demonstrating that in 70 percent of the cases, students taking courses by distance education outperformed their student counterparts in the traditionally instructed courses. By dividing the two-decade time span into four sub-studies, it was determined that the probability of DE [Distance Education] outperforming F2F [Face-to-Face] increased from 1991–2009 and authors predict that it will continue to increase in strength.

Criteria for including studies in the review included the time period covered, the quality of the study, the inclusion of a control or comparison group, and sufficient quantitative data for the two groups to be analyzed. Studies in English, German, French, Spanish and Italian languages were included.

Schachar, M., & Neumann, Y., (2003). Differences Between Traditional and Distance Education Academic Performances: A meta-analytic approach, *The International Review of Research in Open and Distance Learning*, Vol. 4, No.2.

<http://www.irrodl.org/index.php/irrodl/article/viewArticle/153/234>

This meta-analysis research estimated and compared the differences between the academic performances of students in distance education courses relative to those enrolled in traditional settings, as demonstrated by their final course grades/scores within the 1990–2002 period.

“Eighty-six experimental and quasi-experimental studies met the established inclusion criteria for the meta-analysis (including data from over 15,000 participating students), and provided effect sizes, clearly demonstrating that: 1) in two thirds of the cases, students taking courses by distance education outperformed their student counterparts enrolled in traditionally instructed courses; 2) the overall effect size $d+$ was calculated as 0.37 standard deviation units; and 3) this effect size of 0.37 indicates the mean percentile standing of the DE groups is at the 65th percentile of the traditional group (mean defined as the 50th percentile).”

“Based on the 86 studies and using learning outcome data from over 15,000 participating students, the results of the meta-analysis show a strong positive trend indicating that DE is an effective form of instruction. This analysis demonstrates that students engaged in DE academically outperform their F2F counterparts. We have been focusing all along on the question: ‘Is DE suitable for all students?’ The results of this study may raise the inverse question: ‘Is F2F suitable for all students?’ and may begin a paradigm shift in the way postsecondary education is pedagogically conceptualized.”

Neuhauser, C. (2002). Learning Style and Effectiveness of Online and Face-to-Face Instruction, *The American Journal of Distance Education*, 16(2).

http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=EJ656148&ERICExtSearch_SearchType_0=no&accno=EJ656148

In this study the investigator compared two sections of the same course—one section was online and asynchronous; the other was face-to-face—by examining gender, age, learning preferences and styles, media familiarity, effectiveness of tasks, course effectiveness, tests grades, and final grades. The two sections were taught by the same instructor and used the same instructional materials.

“The results revealed no significant differences in test scores, assignments, participation grades, and final grades, although the online group’s averages were slightly higher. Ninety-six percent of the online students found the course to be either as effective or more effective to their learning than their typical face-to-face course. There were no significant differences between learning preferences and styles and grades in either group. The study showed that equivalent learning activities can be equally effective for online and face-to-face learners.

The results of the study must not be overgeneralized. The study demonstrated that equivalent learning activities can be equally effective for learning for online and FTF groups. However, it must be remembered that the FTF activities in this study had to be expanded to include e-mail activities to equal the richness of the online instruction. . . Finally, considering the statistically insignificant differences between the two groups of students in demographics, learning styles and preferences, perceptions of course and task effectiveness, description of the course, and technical competencies, this study provides one more addition to the growing body of literature that asserts the quality of online learning is as effective as FTF learning.”

Patrick, S., & Powell, A. (2009). A Summary of Research on the Effectiveness of K–12 Online Learning, “Effectiveness of Online Teaching and Learning,” iNACOL.

http://www.inacol.org/research/docs/NACOL_ResearchEffectiveness-Ir.pdf

From 1989–2004, there were 15 studies published that met strict criteria for internal experimental validity comparing online courses with conventional courses. Cavanaugh, Gillan, Hess and Blomeyer (2005) published the first meta-analysis of online education outcomes focused entirely on K–12 education, *The Effects of Distance Education on K–12 Student Outcomes: a Meta-Analysis*. The meta-analysis found that virtual instruction produced results measuring student achievement that were “as good or better than” traditional face-to-face instruction.

The Florida TaxWatch report in 2007, “A Comprehensive Assessment of Florida Virtual School,” examines the efficacy and efficiency of the Florida Virtual School, which offers online courses and Advanced Placement courses for middle and high school students statewide. Florida TaxWatch is a nonprofit, known as the “watch dog” of citizen’s tax dollars. A description of the study reads: “The study examined student demographics achievement and cost-effectiveness, finding that during the 2004-05 and 2005-06 school years FLVS students consistently outperformed their counterparts in Florida’s traditional middle and high schools on such measures as grades, Advanced Placement scores and FCAT [Florida Comprehensive Achievement Test] scores.”

The small body of research focused on the effectiveness of K–12 virtual schooling programs supports findings of similar studies on online courses offered in higher education. For example, the college-level studies find “no significant difference” in student performance in online courses versus traditional face-to-face courses, and in particular programs find that students learning online are performing “equally well or better.” Last year, the National Survey of Student Engagement (NSSE, 2008) study found that online learners reported deeper approaches to learning than classroom-based learners and experienced “better use of higher order thinking skills, integrative thinking, and reflective learning.” A list of effectiveness studies is included at the conclusion of the research paper.

Swan, K. (2003). Learning Effectiveness Online: What the Research Tells Us, In J. Bourne & J. C. Moore (Eds) Elements of Quality Online Education, *Practice and Direction*, Sloan Center for Online Education, 13-45.

“Introduction: The goal, the *raison d’etre*, the stuff of education is learning. Thus learning effectiveness must be the first measure by which online education is judged. If we can’t learn as well online as we can in traditional classrooms, then online education itself is suspect, and other clearly critical issues, such as access, student and faculty satisfaction, and (dare we say it) cost effectiveness are largely irrelevant. Indeed, when online learning was first conceived and implemented, a majority of educators believed that it could never be as good as face-to-face learning. Many still do. In fact, however, we now have good and ample evidence that students generally learn as much online as they do in traditional classroom environments.”

“No Significant Differences:” For example, Johnson, Aragon, Shaik and Plama-Rivas [2] compared the performance of students enrolled in an online graduate course with that of students taking the same course taught in a traditional classroom. Using a blind review process to judge the quality of major course projects, they found no significant differences between the two courses. The researchers further found that the distributions of course grades in the two courses were statistically equivalent.

Maki, Maki, Patterson and Whittaker [3], in a two-year quasi-experimental study of undergraduate students, found more learning as measured by content questions and better performance on examinations among students in the online sections of an introductory psychology course.

Fallah and Ubell [4] compared midterm exam scores between online and traditional students at Stevens Institute of Technology and found little or no difference in student outcomes.

Freeman and Capper [5] found no differences in learning outcomes between business students participating in role simulations either face-to-face or asynchronously over distance.

Similarly, Ben Arbaugh [6] compared the course grades of classroom-based and Internet-based MBA students and found no significant differences between them.

In a study of community health nursing students, Blackley and Curran-Smith [7] not only found that distant students were able to meet their course objectives as well as resident students, but that the distant students performed equivalently in the field.

Similarly, Nesler and Lettus [8] report higher ratings on clinical competence among nurses graduating from an online program than nurses who were traditionally prepared.

Likewise, in a review of distance education studies involving students in the military, Barry and Runyan [17] found no significant learning differences between resident and distant groups in any of the research they reviewed.

Most recently, Hiltz, Ahang and Turoff [18] reviewed nineteen empirical studies comparing the learning effectiveness of asynchronous online courses with that of equivalent face-to-face courses. Using objective measures of content learning as well as survey responses by faculty and students, the studies provide overwhelming evidence that ALN tends to be “as effective or more effective than traditional course delivery.”

2. Johnson S. D., Aragon, S.R. Shaik, N. & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environments. *Journal of Interactive Learning Research*, 11(1) 29-49.
3. Maki, R.H., Maki, W.S., Patterson, M., & Whittaker, P.D. (2000). Evaluation of a web-based introductory psychology course, *Behavior Research Methods, Instruments, & Computers*, 32, 230-239.
4. Fallah, M. H., & Ubell, R. (2000). Blind scores in a graduate test. Conventional compared with web-based outcomes. *ALN Magazine*, 4 (2).
5. Freeman, M.A. & Capper. J. M. (1999). Exploiting the web for education: An anonymous asynchronous role simulation. *Australian Journal of Educational Technology*, 15 (1), 95-116.
6. Arbaugh, J.B. (2000). Virtual Classroom Versus Physical Classroom: an exploratory study of class discussion patterns and student learning in an asynchronous Internet-based MBA course. *Journal of Management Education*, 24 (2), 213-233.
7. Blackley, J.A., & Curran-Smith, J. (1998). Teaching community health nursing by distance methods: development, process, and evaluation. *Journal of Continuing Education for Nurses*, 29 (4), 148-153.
8. Nesler, M.S., & Lettus, M. K. (1995). A follow-up study of external degree graduates from Florida. Paper presented at the 103rd Annual Convention of the American Psychological Association, New York, August.
17. Barry, M., & Runyan, G. (1995). A review of distance-learning studies in the U.S. military. *The American Journal of Distance Education*, 9 (3), 37-47.
18. Hiltz, R., Zhang, Y., Turoff, M. (2002). Studies of effectiveness of learning networks. *Elements of Quality Online Education: Volume 3 in the SloanC Series*. SCOLE.

Russell, T.L. (2001). *The No Significant Difference Phenomenon: A Comparative Research Annotated Bibliography on Technology for Distance Education (IDECC, fifth edition)*. <http://www.nosignificantdifference.org/search.asp>

Thomas L. Russell’s book is a fully-indexed, comprehensive research bibliography of research reports, summaries, and papers that document no significant difference (NSD) in student outcomes based on the mode of education delivery (face-to-face or at a distance). The book also

includes a foreword by Richard E. Clark, one of the world's most cited researchers in the area of media research design. Previous editions of the book were provided electronically, the fifth edition is the first to be made available in print from The International Distance Education Certification Center (IDECC). This book is considered one of the most important resources on distance education research. Students and educators who have ever wondered what research says about the effectiveness of distance learning as compared with the traditional classroom model of education should start here. This resource summarizes 355 different research studies that support the conclusion that "no significant difference" exists between the effectiveness of classroom education and distance learning. *The No Significant Difference Phenomenon* was the winner of the 1999 "Outstanding Publication in the Area of Distance Learning" from the Instructional Telecommunications Council.

In the foreword, Clark summarizes the research as follows: "The point is that no matter who or what is being taught, more than one medium will produce adequate learning results and we must choose the less expensive media or waste limited education resources." He maintains that "no significant difference (NSD)" in studies that are well designed is as important a finding as those with statistical differences because they "help us overcome our strong inclination only to accept evidence that confirms our beliefs about the world." Clark argues for new research avenues that can begin to explore the economic benefits of alternative technologies in online learning to assess their cost contributions.

The author, Thomas L. Russell, developed the first technology-based distance education system at North Carolina State University. He first published the Compendium of NSD Studies in 1992, stating in the introduction, "The fact is that the findings of comparative studies are absolutely conclusive; one can bank on them. No matter how it is produced, how it is delivered, whether or not it is interactive, low-tech, or high-tech, students learn equally well with each technology and learn as well as their on-campus face-to-face counterparts." Since that time, Russell has tripled the number of studies in the NSD listings, and studies continue to grow through the NSD website sponsored by WCET.

No Significant Difference (NSD) website, www.nosignificantdifference.org is provided as a service of WCET (WICHE Cooperative for Education Technologies), a division of the Western Interstate Commission for Higher Education.

The NSD website is designed to serve as a companion piece to Dr. Russell's book, *The No Significant Difference Phenomenon*. The website is intended to function as an ever-growing repository of comparative media studies in education research. The website provides a form to nominate new entries both to non-significant difference and significant difference categories, as well as a search engine to locate up to date studies.

Growth of Online Learning

Research on the growth of online learning, as tracked by the annual Sloan Surveys and others, indicate that it is fast-paced and substantial. The explanations for the growth, based on survey research, are traced to the economic downturn, the increasing adult student population, and the growing belief among academic leaders that it is as good, or better, than face-to-face learning. The College of 2020 study, Chronicle Research Services, suggests that the growth of online learning is also in response to the new college student who is older, more technologically savvy, and in need of an accessible, low cost educational option. Research now includes more and more studies of the continuing growth of online learning within and across countries, making it a global phenomenon.

Allen, E., & Seaman, J. (2010). *Class Difference\$: Online Education in the United States.* Retrieved from http://sloanconsortium.org/publications/survey/class_differences.

The 2010 Sloan Survey of Online Learning represents the eighth annual report on the state of online learning in U.S. higher education. The survey is designed, administered, and analyzed by the Babson Survey Research Group with support from Alfred. P. Sloan Foundation and data collection conducted in partnership with the College Board. The report is based on responses from more than 2,500 colleges and universities nationwide.

Online enrollments continue to grow at rates faster than overall higher education. Enrollments in online courses increased by 21 percent between 2009 and 2010, compared with an increase of two percent for campus enrollments. More than 5.6 million students were enrolled in at least one online course in fall 2009, an increase of nearly one million students over the previous year.

“This represents the largest ever year-to-year increase in the number of students studying online,” said study co-author Elaine Allen, co-director of the Babson Survey Research Group and Professor of Statistics & Entrepreneurship at Babson College.

Report highlights include:

- 63 percent of institutions surveyed said that online learning was an essential part of their future strategy;
- Almost 30 percent of all enrollments now are in online courses;
- Nearly three-quarters of institutions report that the economic downturn has increased demand for online courses and programs;

- More than three-quarters of academic leaders at public institutions report that online is as good as or better than face-to-face instruction; and
- Reported year-to-year enrollment changes for fully online programs by discipline show most growing, but with a sizable portion seeing steady enrollments.

Bates, T. (2011). 2@11 Outlook for Online Learning and Distance Education. *Contact North*. Retrieved from <http://search.contactnorth.ca/en/data/files/download/Jan2011/2011%20Outlook.pdf>.

Internationally acclaimed author, educator, and research expert Dr. Tony Bates highlights major developments in the ongoing rapid growth of online and distance education during 2010, identifies a number of systemic barriers limiting the progress of distance learners, and describes key opportunities for 2011.

Major developments in 2010 included the expansion of enrollments in online courses by 21 percent compared with a 2 percent expansion of campus-based enrollments. Additionally, it is noted that while much of the expansion is occurring in the aggressive, for-profit sector of education, enrollment for online courses continues to exceed that of campus-based courses in state universities as well. Many online students come from segments of the population such as lifelong learners, new immigrants, and marginalized communities which are currently underserved by the state system.

Systemic barriers to online and distance education include faculty resistance and lack of sufficient training, limited institutional and instructional goals in this area, failure to adequately project and fund the cost of online learning, and lack of a comprehensive approach to accommodate student mobility and non-traditional learners.

Dr. Bates concludes his report by describing a number of timely opportunities for growth and development in online/distance learning. These include course redesign, applications to accommodate greater student mobility, expansion of open educational offerings, greater inclusion of multimedia materials in online courses, implementation of learning analytics to improve instruction, and growth in shared services as a means of cost-saving.

Bates, T. (2010). The Online Higher Education Market in the USA. Retrieved from www.tonybates.ca/2010/02/08/the-online-higher-education-market-in-the-usa.

This post is Dr. Bates' summary and analysis of Eduventures' 2009 report entitled "The Online Higher Education Market Update," by R. Garrett. (Although the actual report is not available on the Internet, the link to a short video on the report by the author is available at www.eduventures.com/resources/video?vid=ohe1.fly.)

"The focus of this report is on the impact of the recession on the online market, but the report also provides some interesting data about competition between for-profit and public institutions for the higher education online market." According to the report the for-profit sector has about 32 percent of the online market compared to only seven percent of the total market, citing this sector's marketing and quick response as explanations for why they claim a disproportionate share. The report goes on to provide "pointers" for how public institutions might increase their share of the market.

"Enrollments in fully online courses currently account for approximately 11% of all enrollments with an expected increase to 20% by 2014. Despite this sizeable market, at present still more than half (55%) of all U.S. degree-granting institutions offer no fully online courses. However, Eduventures estimates that of the adult market (25+), 24% are currently in online programs and this is expected to increase to 35-40% by 2014."

Eduventures notes that the largest growth area in online teaching is in programing at the Master's level, and that the two most popular programs are business and education, although there are many subjects being added.

A clear message is that for-profit institutions offering 100 percent online programs are better positioned to expand than public universities who, "partly because of faculty resistance and partly because of a wish to exploit the benefits of a physical campus, have neither the desire nor the capacity to expand rapidly into fully online learning...[however] online enrollments have benefited from the recession in the USA and therefore could act as a stabilizing factor for student enrollment in both for-profit and public universities."

Green, K.C., & Wagner, E. (2011). Online Education: Where Is It Going? What Should Boards Know? *Trusteeship Magazine*, Association of Governing Boards of Universities and Colleges. Retrieved from <http://agb.org/trusteeship/2011/1/online-education-where-it-going-what-should-boards-know>.

New data from the fall 2010 Managing Online Education Survey, sponsored by two organizations, The Campus Computing Project and the WICHE Consortium for Educational Technology (WCET), point to robust growth in online programs at many institutions across the country. Fully half of the survey participants report that online enrollments at their institutions grew by more than 15 percent over the past three years, and two-fifths expect online enrollments to jump by more than another 15 percent over the next three years.

Trustees and campus officials who remember earlier excitement about the hopes for e-learning and the internet may well be skeptical, however “higher education has learned from the mistakes it made in the past,” and “today’s campus conversations seem to reflect a new sense of purpose and pragmatism about the challenges as well as the opportunities of online education.” Several factors appear to be driving the increase in online enrollments according to the survey research.

- The advancement in learner-enabling technologies,
- Economic issues, specifically the need for new skills in a changing economy,
- Greater experience with online learning, and
- The opportunity to attract new students from underserved markets thereby providing new sources of revenue.

Drawing from data compiled from the recent two surveys, the authors identify ten key trends in the ongoing development of online education at the college and university level, including: rising online enrollments, experience in making online profitable, changing organizational structures to accommodate online learning, and focus on improved quality metrics to evaluate online learning. They follow with a list of issues for trustees to consider as they evaluate online learning, including: What will it cost? How will we assess quality? How do we support faculty and students? They conclude, “The continuing conversation about quality involves more than simply comparing the performance of students in online and on-campus courses. Ultimately, it must focus on what students learn, not where they learn, and what types of learning environments, technologies, and resources foster student learning.”

Ambient Insight Research. (2009). “The U.S. Market for Self-paced eLearning Products and Services: 2010-2015 Forecast and Analysis” in 2011 Outlook for Online Learning and Distance Education, www.contactnorth.ca.

In this report, growth of online enrollment for 2009 is compared to predictions for 2014. In 2009, there were a total of 27.04 million students in higher education programs:

- 1.25 million students took all of their classes online (4.6 percent)
- 10.65 million students took some of their classes online (39 percent)
- 15.14 million students took all of their courses in traditional classrooms (54 percent)

In 2014, there will be 27.34 million students in higher education programs in total (an increase of 2 percent over the five years):

- 3.55 million students will take all of their classes online (12.8 percent)
- 18.65 million students will take some of their classes online (68.2 percent)
- 5.14 million students will take all of their courses in a physical classroom (19 percent)

The Ambient report is predicting more than 80 percent of all higher education students will be taking at least some of their courses online by 2014 compared with 44 percent in 2009.

Nagel, D. (2010). The Future of E-Learning is More Growth. *Campus Technology*. Retrieved from http://campustechnology.com/articles/2010/03/03/the-future-of-e-learning-is-more-growth.aspx?sc_lang=en.

In this article Nagel asserts that, by virtually every measure, electronic learning is experiencing unprecedented growth and will continue to do so for the foreseeable future. “The Worldwide Market for Self-paced eLearning Products and Services: 2009-2014 Forecast and Analysis” released by research firm Ambient Insight in March, 2010 bolstered previous research in this area, showing that electronic learning, by dollar volume, reached \$27.1 billion in 2009 and predicted this figure will nearly double that by 2014, with academic institutions leading the way. Sam Adkins, chief research officer at Ambient Insight, explained that in North America—the largest region for electronic learning—the growth is being driven by academic institutions, both preK–12 and higher education (43 percent of all North American purchases). The dollar figures in the research included expenditures for packaged content, custom content development

services, learning platform and tool hosting services, authoring software and tools, and installed learning platforms.

Van Der Werf, M., & Sabatier, G., (2009). The College of 2020: Students. *Chronicle Research Services*. Available for purchase online at www.chronicle-store.com. (Review based on the Executive Summary accessed online at www.deanstalk.net/files/thecollegeof2020executivesummary-1.pdf.)

“This is the first Chronicle Research Services report in a three-part series on what higher education will look like in the year 2020. It is based on reviews of research and data on trends in higher education, interviews with experts who are shaping the future of colleges, and the results of a poll of members of a Chronicle Research Services panel of admissions officials.” (From the Chronicle Store’s description of the report)

“Is your college ready for the new student? The college student of the future will be older, more technologically savvy, and more likely to see going to college as a retail transaction.” In fact, according to this research, more and more students will not be able to afford to be full-time, residential students and will be looking for low-cost, online options. “Colleges that have resisted putting some of their courses online will almost certainly have to expand their online programs quickly.” In addition they will need to have multiple starts throughout the year, provide access from mobile devices, and be able to provide online access to professors, classroom discussions, and study groups.

“A fundamental transformation in the way students view higher education is well underway. While some public colleges and universities still cling to the traditional model of education, those who want to keep pace with the rapidly expanding group of for-profit educational institutions must adapt quickly, valuing student convenience as they increase hybrid class schedules including strong offerings of online learning.”

The class of 2020 will be more diverse than ever.

- If current trends continue, minority students will outnumber white students on college campuses shortly after 2020.
- The average age of students will trend higher with more people becoming lifetime learners as they seek to advance or change careers.
- The number of high-school graduates will be unchanged from 2010–2020.

- The adult market will be the fastest-growing one in higher education for the foreseeable future.
- The location of a college [and its recruiting area] will be the most significant factor in determining its flow of enrollees in the next decade.
- To continue to grow, public institutions will need to enroll and be able to serve less-wealthy and less-prepared students.

Over a hundred admissions officers responded to the survey and two-thirds indicated that, while 80 percent of their current students were full-time, less than half thought that would be true by 2020. Likewise, while two-thirds said 80 percent of their current students were 18–25, only half believed that would be true in 2020.

In response to these changing demographics, the authors maintain “nothing is as likely to change the face of higher education over the next decade as the switch to more online learning.” It is clear that students increasingly want and need this option.

Responding to this need, the authors report, there is growth in online enrollment across almost all disciplines. There is a strong correlation between the size of a higher education institution and the average number of its online students, and the number of colleges offering online courses continues to grow.

Community colleges and for-profit institutions will likely continue to be the avenue of educational choice for reasons of cost and convenience unless traditional colleges and universities adjust their paradigms to maintain their position in an increasingly competitive market. “Good teaching will always be at the core of a good university, but for most colleges, higher education will become a more retail-based industry than it ever has been. The students of the future will demand it. Many colleges have a long way to go before they can fulfill that demand.”

Christensen C., Horn M., & Caldera, L., (2011). *Disrupting College: How Disruptive Innovation Can Deliver Quality and Affordability to Postsecondary Education*. Retrieved from www.innosightinstitute.org.

Christensen and colleagues provide an analysis of what the speed of transition to online learning will be in higher education. They maintain that the widespread adoption of online learning will follow an S-curve, a predictable pattern of how a new disruptive innovation begins substituting for the old or existing model. They provide a chart that predicts the pace of substitution of fully online-delivered learning versus traditional instruction in American colleges and universities. “It

shows that about 10 percent of students took at least one online course in 2002. That fraction grew to 25 percent in 2008; was 29 percent in 2009; and will be 50 percent in 2014... In other words, the online learning in college train has left the station.”

In an additional case study of the North Carolina Community College System, the growth of online learning “has been so rapid that online courses accounted for 37 percent of all courses taken in 2009, up from 2.4 percent 10 years earlier.” Using the pace of substitution rate associated with the S-curve, it “indicates that 50 percent of all courses will be delivered online in the second semester of the 2010 school year, and 90 percent of all courses will be delivered online by 2010.”

Bold, M., Chenoweth, L., Garimella, N. (2010). “Bricks and Clicks,” *Journal of Asynchronous Learning Networks*, Vol 12 (1). <http://www.thefreelibrary.com/Click+and+bricks--transforming+education.-a0121714095>

This paper describes the current role of distance learning in countries described as growing economies, and focuses on global developments in distance education using the BRIC nations (Brazil, Russia, India, and China) as examples. According to the authors, “Distance learning is the new player in a global concern: the right to education.” Distance learning is the route to increasing access to education and has resulted in mega universities, open universities, branch campuses by foreign institutions operating in a host country or in partnership with a local university and cross-border education.

Two billion people worldwide can be identified as the potential market for distance learning for higher education globally; “Online delivery may exceed US \$69 billion by the year 2015.” Investment in infrastructure is key to providing access to distance learning and is greatly impacted by regulations and government within a country and across countries. Can nations with robust online networks serve others in online education delivery? They can, and the number of exporters of higher education is growing though the U.S. is still the leading exporter of education. Australian universities and the U.K. Open University are also major providers, and Chinese and Indian open universities are increasing in size.

The World Trade Organization has been in negotiations to name education as a marketable service, subject to import and export regulations, and proposals for higher education, including distance learning, are working through General Agreement on Trade and Services (GATS) proceedings. Online learning within the agreement is referred to as cross-border and includes all distance education and virtual universities - this is a growing market with great potential.

The authors summarize the size and growth of distance learning in BRIC countries. In Brazil, for example, distance education has been in use since the early 1900s. Through a program known as Fundescola, distance learning has been crucial to the training of teachers in diverse regions of the country. In India, there are over 11 million students enrolled in Indian universities and colleges. In 2004, India's National Institutes of Open Schooling (NIOS) ranked as the world's largest school system, with 1.4 million learners (children and adults). In China, more than a quarter of China's 2800 colleges and universities use distance learning as the primary delivery method for education. In Russia, in contrast to Brazil's highly centralized approach, technology initiatives are intensive but disparate, with limited connectivity in rural areas. The study concludes with a proposed typology that rates cross-border growth of distance learning in each BRIC country on seven criteria.

Cost of Online Learning

Research studies on the cost of online learning approach the subject in two ways: 1) comparisons to the cost of traditional classroom learning, and 2) projections of potential cost benefits if it is conducted in an optimum way. There is a growing body of research indicating that online learning can be delivered simultaneously to large numbers of students without increasing personnel costs while still achieving desired learning outcomes. Christensen and others argue, however, that a new business model for delivering instruction will be required if online learning is to become a sustainable source of new revenue. As online learning grows and becomes more systemic, studies aimed at determining its economic benefits are perhaps the most promising new area of research.

Meyer, K. PhD. (2008). If Higher Education is a Right, and Distance Education is the Answer, then Who Will Pay? Sloan Consortium, *Journal of Asynchronous Learning Networks*, Vol. 12 (1), February.

http://www.distanceandaccesstoeducation.org/contents/JALN_v12n1_Meyer.pdf

This policy research addresses two questions: “(1) can state governments in the United States afford to fund this [distance education] initiative, and (2) can public higher education institutions in the U.S. fund this effort through capitalizing on cost-efficiencies of online learning.”

To address the question of whether states can pay to build online networks, Meyer reviews state appropriations to public higher education, projected state revenue, projected high school and young adult growth, and growing percentage of family income needed to pay tuition. The conclusion: “Absent a major change in the economy, state tax structures and willingness to fund higher education, and the public’s willingness to tax itself, the answer may be ‘no.’”

To address the second question, whether public institution can pay through efficiencies resulting from online learning, Meyer focuses on cost savings in online learning. Research on studies conducted through the National Center for Academic Transformation (NCAT), led by Carol Twigg provide evidence that courses can be redesigned to increase enrollment, lower cost, and improve learning. In her landmark study on course redesign, “with funding from Pew Charitable Trusts, 30 institutions received grants to redesign courses accompanied by a solid plan to lower costs and document improved student learning. Those 30 institutions reduced costs an average of 37%, with some projects reducing costs by 15% and others by 77%, and generated a savings of \$3.1 million *per year* in operating costs.”

“If higher education institutions decide to grasp the potential of online learning and put the work into making it cost-efficient for themselves and beneficial for students, the promise of a steady revenue stream may help motivate and fuel the process.”

Twigg, C. A. (2001). *Innovations in Online Learning: Moving Beyond No Significant Difference*. Retrieved from The Pew Learning and Technology Program.
<http://www.educause.edu/Resources/InnovationsinOnlineLearningMov/155350>

Higher education is already making use of online learning, but, according to Twigg, the current paradigm of how to use technology in course design and delivery is limiting and prevents them “from realizing the potential in a new application of technology.” Specifically, the author attempts to settle the question of whether design and delivery of online learning costs more or less than traditional classroom learning.

“Cost is directly related to that of access...it is very difficult for most existing institutions to expand access, whether on campus or online, without facing significant budget increases.” Higher education institutions need to concentrate on “creating an efficient course development process and supporting that process with tools that increase efficiency. The [online] model is one in which large, up-front investments are made in single courses, using the best expertise possible in the development team, with the expectation that very large numbers of students will ultimately enroll.”

The well-designed online model allows a “small core of full-time faculty to set academic standards, oversee curriculum, establish academic policies including degree requirements, and so on. Part-time, adjunct faculty carry out the bulk of instruction.” These new courses can substantially “reduce course-delivery costs by using technology to serve large numbers of students.”

In Twigg’s (2003) “Improving Learning and Reducing Costs: New Models for Online Learning, *Educause Review*, 38(5), 28-38,” the new course designs developed during the eight million dollar study by faculty in 30 universities are described. The new designs served more students and resulted in a range of 37-75 percent savings. Ninety percent of the designs also reported improved learner outcomes. www.educause.edu/ir/library/pdf/erm0352.pdf

The National Center for Academic Transformation (NCAT), directed by Twigg, is a rich source of articles and monographs on redesigning courses to lower cost, improve learning and achieve scale. www.thencat.org

Learner-Centered Model is Cost-Effective, Effective Practice Summary, Sloan C, retrieved from http://sloanconsortium.org/effective_practices/learner-centered-model-cost-effective

This study demonstrated that an introductory psychology course redesigned for online delivery increased access, improved learning effectiveness and student satisfaction, lowered costs and maximized faculty time and resources. The features of the course redesign included:

- A reduction in lecture time by 50 percent (replaced with a variety of interactive computer activities in which students receive timely feedback).
- More interaction between students and between students and faculty/faculty assistants as well as more personalized attention (through online resources).
- The development of standard curricula with common material that are shared across the multiple course sections.
- An increase in course section size from 75 to 125.
- Introduction of asynchronous learning materials.

Savings accrue from the increase in section size and the reduction of a traditional professor lecture format. The previous traditional courses model cost approximately \$113 per student; the course structure revision is anticipated to cost \$58.

Meyer, K. PhD. (2006). “The Road Map to Cost Efficiencies in Online Learning” in *Cost-Efficiencies in Online Learning*, ASHE Higher Education Report, 32; 1-123. Retrieved from Wiley InterScience. <http://www.josseybass.com/WileyCDA/WileyTitle/productCd-0787988553.html>

Discovering cost efficiencies through online learning is becoming particularly important to higher education as numbers of students increase, state support decreases, and tuition continues to rise. All these pressures, according to the author, accentuate the productivity problems of higher education.

Referring to the “IT productivity paradox,” the article reviews literature on why investments in technology have not led to productivity, and, in some cases, worsened it. As has been documented by Twigg and others, “bolting” technology on to conventional courseware, maintaining standard classroom sizes, and adding on-campus fees does not improve cost efficiencies. “The big spurts in productivity come when a new technology is combined with new ways of doing business.”

In contrast to the productivity trends in U.S. online higher education, are those of the mega-universities. The average cost per student in the U.S. was \$12,500 and in the UK \$10,000, at the same time mega-universities enrolled 2.8 million students at around \$350 per student. (Mega-universities include Payame Noor University in Iran, 117,000 students, and Anadolu University in Turkey, 578,000 students.) According to the author, the Open University, which enrolled 157,000 students in 1995, is also known for its high-quality materials and lower-cost tutors.

Pressure is building to make use of online learning to improve productivity, and to break the assumption “that cost and quality are intricately and tightly tied together.” There is plenty of evidence that “online learning can perform as well as traditional classroom teaching and can increase student learning for many students.” If a higher education institution wants to improve cost efficiencies using online learning, there is a great deal of evidence that they can improve student learning as well. The article provides a road map for what it will take in terms of funding, time, and effort to achieve cost-efficiencies in online learning.

Rickard, W. *The Efficacy (and Inevitability) of Online Learning in Higher Education.*
Retrieved by Pearson Learning Solutions www.pearsonlearningsolutions.com

Dr. John G. Flores, CEO, United States Distance Learning Association (USDLA), says in the foreword, “No longer viewed solely as an alternative to traditional programs, online learning has become an integral aspect of all types of mainstream education and training environments.” This white paper defines the efficacies of online learning as: 1) increasing access; 2) improving educational quality; and 3) containing and reducing cost. Flores maintains that accessing high-quality programs anywhere, anytime “is today’s new academic gold standard.” Efficacies brought to higher education through online learning in these three critical areas are as follows:

Increased access. “With demand for higher education growing at unprecedented rates, many institutions struggle to accommodate demand in spite of limited physical space. Online learning makes it possible to serve more students without necessarily having to invest in more classroom space. Similarly, budget pressures impact a wide range of resources, including human resources, classroom space, materials, and labs. During financially challenging times, institutions find that intelligent applications of online learning make it possible to serve more students with fewer resources.”

Improved quality. As documented by the U.S. Department of Education’s Staying the Course report, online courses and educational programs produce, on average, stronger student-learning outcomes than do those conducted solely in traditional classroom environments.

Cost containment. As with access and quality, the efficacy of online learning depends on higher education's ability to contain cost while delivering accessible, high-quality education. While technology will be expensive to purchase and implement, many schools are finding the return on investment can be significant. "According to a report issued by the American Association of State Colleges and Universities, more than one-half of the institutions surveyed say they rely on contingent faculty and online learning strategies - such as those developed through the National Center for Academic Transformation's (www.thencat.org) technology-enabled course redesign - in order to reduce operating costs."

Bates, T. (2011, March 22). "The Cost of Online Learning: \$12.50 an hour?" Retrieved from www.tonybates.ca/2011/03/22/the-cost-of-online-learning-12-50-an-hour.

In this blog post, educational authority Tony Bates describes how a university can analyze the cost of online course offerings. He concludes that online education is more cost effective over the long run than traditional education.

Introduction: "I'm frequently asked about the costs of online learning, and in the past I have always groaned and said, 'It all depends...' While this is true, it is possible to give at least some ball-park figures, so here are some questions and answers."

Conclusion: "You may well challenge the cost methodology and the assumptions that drive the costs in this example. You may also challenge the teaching model for online learning. Good: then come up with a better way of looking at the cost issue. We do need more open discussion about the costs of not just online learning, but all teaching in universities and colleges. It is lazy and unjust to merely keep increasing tuition fees rather than looking at new ways of developing and delivering programs that can reduce costs without jeopardizing the quality of teaching. This is particularly incumbent on those of us who believe in online learning."

Belawati, T. (2006, September). "Financial Management System in Open and Distance Learning: An Example at Universitas Terbuka." Commonwealth Education Media Centre for Asia. Vol. 12, No. 1. Retrieved from www.cemca.org/newsletter/sept2006/sept2006.pdf.

Financial management in open and distance learning (ODL) institutions plays a central role not only because it helps decision makers to choose alternative methods and media for ODL, but also because it provides accountability of political decisions. In countries such as Indonesia, the choice of ODL method is as much political as educational. ODL is expected to solve social problems of access and equality to high-quality education.

The ODL system, acknowledged as an alternative and cost-effective method for education, has been widely used by different countries. Studies have shown that the ODL system can indeed be

as effective as conventional face-to-face learning system for instructional delivery (Beare, 1989) and that ODL can be cheaper when the economies of scale are met (Laidlaw & Layard, 1974).

This paper describes a financial management system within ODL. More specifically, it discusses the nature of funding and cost classification, strategies to generate financial resources and budgeting procedures, the measures of outcome/effectiveness, and the cost-effectiveness analysis using Universitas Terbuka as a case study.

Caswell, T., Henson, S., Jensen, M., & Wiley, D. (2008). "Open Educational Resources: Enabling Universal Education," *International Review of Research in Open & Distance Learning*, Vol. 9 (1).

"The role of distance education is shifting. Traditionally distance education was limited in the number of people served because of production, reproduction, and distribution costs. Today, while it still costs the university time and money to produce a course, technology has made it such that reproduction costs are almost non-existent. This shift has significant implications, and allows distance educators to play an important role in the fulfillment of the promise of the right to universal education. At little or no cost, universities can make their content available to millions. This content has the potential to substantially improve the quality of life of learners around the world. New distance education technologies, such as OpenCourseWares, act as enablers to achieving the universal right to education. These technologies, and the associated changes in the cost of providing access to education, change distance education's role from one of classroom alternative to one of social transformer."

This article provides a history of the Open Course Ware (OCW) movement, beginning with MIT's decision in April, 2001, to place all their courses online and provide free and unlimited access. As of November, 2007, more than 160 higher education institutions and other organizations had committed to OCW websites to share courses. At that time, MIT had completed moving virtually all its courses, 1800, online with syllabi, assignments, lecture notes, and exams. In addition to access of free content, Creative Commons, or "open" license, provides for all materials to be accessed and remixed. The Open University of the UK encourages users to remix content available on their site.

The article provides guidance to higher education institutions on how to build and use OCW, describes benefits and challenges in its use, and guidance on how to sustain OCW projects. The authors conclude that OCW provides a way to make Article 26 of the Universal Declaration of Human Rights a reality. "Everyone has the right to education," (United Nations, 1948).

Snow, B. (2011). "Internet to Bring Down the Sky-High Cost of Higher Ed, Experts Say." Retrieved from www.foxnews.com/scitech/2011/09/03/stanford-yale-and-oxford-educations-are-free-online.

As college and university classrooms around the country fill with students facing mind-numbing tuition, free online classes are filling up too—and their rising number threatens to destroy the current model that has student loans soaring and parents feeling the bite, experts told FoxNews.com.

"The current system makes little sense," argues Henry Eyring, co-author with Clayton Christensen of *The Innovative University*. "A student pays one amount regardless of credit load or type of course being taken, and the university has no financial incentive to help the student get a good grade," he told FoxNews.com.

Online learning changes that though, driving down the cost of a traditional education, Eyring said. For example, per-course pricing instead of semester-based is making waves, not to mention a new option of taking an online course for free, then paying a fee for [credit](#) upon completion.

Consequently, universities that fail to embrace the change could face irrelevancy, or worse, extinction.

"Online learning will disrupt only those traditional universities and colleges that don't adopt it," Eyring concluded. "The much greater risk will be to institutions that are imitating the elite schools' emphasis on scholarship and [graduate programs](#) but aren't investing in online learning innovations for their undergraduate students."

Read more: www.foxnews.com/scitech/2011/09/03/stanford-yale-and-oxford-educations-are-free-online/#ixzz1XDB49A00

Impact on Instructional Design and Delivery

As online learning continues its rapid growth in colleges and universities, there has been an increased study of strategies for its successful implementation. These include case studies describing effective practices for building, funding, and sustaining online programs within the university. And there is also a growing research base on the delivery of effective online models that are scalable, improve learning, and lower cost. Throughout the research, there is an emphasis on the need for administrators to be strategic in their use of online learning, and to ensure faculty are trained in its effective design and delivery.

Abel, R. (2005). *Achieving Success in Internet-Supported Learning in Higher Education: Case Studies Illuminate Success Factors, Challenges, and Future Directions*. Alliance for Higher Education Competitiveness. Retrieved from www.ahec.org/research/study_reports/IsL0205/TOC.html.

This study, sponsored by the Alliance for Higher Education Competitiveness, pulled from the experiences of 21 institutions to synthesize best practices for achieving success in online learning. In the process, the study identified a number of findings closely correlated to an institution's success. These include:

- Consistency of Internet-supported learning with institutional mission (64 percent)
- Competitive pressure to provide Internet-supported learning (64 percent)
- Intention to grow enrollments through Internet-supported learning (59 percent)
- Administrators and faculty are clear that internet-supported learning is a long-term commitment (91 percent)
- Administrators are actively involved in leading the efforts and administrative support for success is perceived as adequate for success (82 percent)

Additional findings note that successful institutions measure their success in multiple ways and that quality is at least or more important than growth. Students and faculty are well-supported and there are established capabilities including course development help (86 percent), technical support for faculty (86 percent), student phone helpdesk (86 percent), and one-on-one instructional design consultation for faculty (82 percent).

According to the study, the “secret sauce” that appears to be most critical for an institution in achieving success is taking a “programmatic approach.” Focus on getting full programs online, rather than single courses, greatly increases the chance of achieving “overwhelming success” by a four to one margin. The last summary finding: “To successful institutions Internet-supported learning is an opportunity to reconsider the intersection of mission and student service and to create an improved educational product.”

Abel, R. (2005). Implementing Best Practices in Online Learning. *Educause Quarterly*. Retrieved from <http://net.educause.edu/ir/library/pdf/eqm05312.pdf>.

This article by the author of the study, “Achieving Success in Internet-Supported Learning in Higher Education” (cited above), provides a summary of the report, describing the 21 institutions involved in the study, and concludes with specific questions that may be used to evaluate an institution’s online learning initiatives. The article outlines the common denominators for success in Internet-supported learning across the 21 case studies. The resulting framework provides direction for success in four critical areas: Motives and Leadership; Focus on Programs; Faculty Support and Student Services; and Goals and Measurement. Concluding with key lessons for universities, it provides a checklist of important considerations with metrics on their ranked importance.

diFilipo, S. (2011). Connecting the Dots to the Future of Technology in Higher Education. EDUCAUSE review. Retrieved from <http://net.educause.edu/ir/library/pdf/ERM1147.pdf>.

In this article, diFilipo, vice president and CIO at Cecil College, seeks to connect the pockets of innovation and emerging technologies within colleges and universities in order to reveal a picture of the future of technology in higher education. To that end, he identifies the following key “dots” for consideration by institutional administrators:

- Ensuring a vision whereby the academy maintains its business, academic, and social currency;
- Devising a plan to guide speedy decision-making and agile action in order to effectively leverage new technologies as they emerge;
- Planning for unknown innovation proactively rather than reacting to emerging technologies;
- Learning to manage access to information rather than informational assets;

- Assigning high priority to technologies that support teaching and learning in ways most relevant to today's students; and
- Establishing hiring practices that focus on strong leadership and attitude rather than traditional qualifications that do not account for a person's ability to respond proactively and positively to the fast-moving pace of technological development and implementation.

diFilipo also notes that, while the “technologies that will require the greatest agility and speed of adoption are yet to be developed,” at least six with great potential for supporting teaching and learning both online and in blended or hybrid teaching environments bear mention now. These are curation, second screen learning, near field communication (NFC), spatial operating environments, learner developed apps, and augmented reality. By giving focused efforts to understanding and incorporating these innovations and emerging technologies, the leaders of traditional colleges and universities are helping to ensure that they remain relevant in a higher education realm increasingly dominated by technology.

Hutchins, H.M. (2003). Instructional Immediacy and the Seven Principles: Strategies for Facilitating Online Courses. Retrieved from www.westga.edu/~distance/ojdl/fall63/hutchins63.html.

What does the research in instructional immediacy and the practical suggestions innate to Chickering and Gamson's (1987) Seven Principles tell us about effectiveness in web-based instruction? Just the things that most (good) instructors already know: encourage students to think and learn, give prompt feedback, provide guidance and support, and consider what new and different ways technology may add support to current strategies and help to induct new ones. Worley (2000) stated it best that what faces an instructor teaching a web-based class is really “age-old questions that have always plagued the classroom, technically enhanced or otherwise” (p. 101). Rather than focus on how useful or comparative the specific technology is in web-based instruction, research should focus more on how such technology can support and enhance specific teaching and learning goals in web-based classes.

This paper reviews compelling research in the areas of instructional immediacy and Chickering and Gamson's (1987) Seven Principles that can aid instructors in creating an interactive, learning community taught via the web. Perhaps distance education administrators can expand their offering of facilitation skills to faculty and staff members interested in teaching online courses. Further, researchers can embark on rich paths of discovery into new instructional models that are learner-centered and amenable to various forms of technological mediums. Future research geared toward how specific learner and instructor attributes and instructional design issues impact the learning situation in web-based classes will provide a wealth of practical strategies tied to proven results.

Instructional Strategies for Online Courses. (2011). Retrieved from www.ion.illinois.edu/resources/tutorials/pedagogy/instructionalstrategies.asp.

The online learning environment allows educators and students to exchange ideas and information, work together on projects, around the clock, from anywhere in the world, using multiple communication modes. Given the advantages and resources of this rich learning environment, how can multiple instructional strategies best be utilized for online learning? Just as in the traditional classroom, instructional strategies are most effective when employed specifically to meet particular learning goals and objectives. Effective course design begins with asking: what are the major learning goals and objectives for this course? Once these goals and objectives have been identified and clearly articulated, the question of which learning strategies, activities, and experiences to employ can be addressed.

Much of the power of learning via the Internet lies in its capacity to support multiple modes of communication including any combination of student-student, student-faculty, faculty-student, faculty-faculty, student-others, others-students, etc. Taking into account the varied learning styles of learners and providing opportunities for self-directed and collaborative learning, educators can facilitate powerful, effective courses geared to achieve specific learning goals and outcomes using the vast resources and capacities of online learning.

This educational resource provides a description of the multiple instructional strategies that are available for traditional classrooms, and how those strategies are also available, and often enhanced, in an online course. Instructional strategies described include: learning contracts; lecture; discussion; self-directed learning; mentorship; small group work; projects; collaborative learning; case study; and forum. Some of these instructional strategies described for use in online courses include an online tutorial.

Kim, K.J., & Bonk C.J., (2006). The Future of Online Teaching and Learning. EDUCAUSE Quarterly. Retrieved from www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/TheFutureofOnlineTeachingandLe/157426.

As institutions of higher education increasingly embrace online education, and the number of students enrolled in distance programs continues its fast-paced rise in colleges and universities throughout the United States, many states, institutions, and organizations have been working on strategic plans to implement online education. This study surveyed instructors and administrators in postsecondary institutions (members either of MERLOT or WCET) to explore future trends of online education. In particular, the study makes predictions regarding the changing roles of online instructors, student expectations and needs related to online learning, pedagogical innovation, and projected technology use in online teaching and learning.

Results suggest that, if the quality of online education is to improve as currently projected by this study's respondents, campuses must make looking at the pedagogical issues in online learning a high priority. Collaboration, case learning, and PBL are likely to be the preferred methods of online instructors, with few relying solely on traditional methods.

The continued explosion in online learning will bring increased attention to workshops, courses, and degree programs in how to moderate or mentor with online learning. Given that many respondents expect to receive some sort of training and support from their institutions to be ready for online teaching, colleges and universities need to plan their responses strategically. A lack of training and support for faculty tasked with online teaching could significantly hinder an institution's positioning in the current educational marketplace, not to mention discourage students with increasingly high expectations for their online learning experiences.

In addition, the study indicates that most postsecondary institutions now recognize the potential of the web as a tool for virtual teaming or collaboration, critical thinking, and enhanced student engagement. This raises the question, "Do current CMSs provide tools to realize the potentials of the Web for innovative teaching and learning?" If not, perhaps recent developments in open source courseware will force CMS vendors to develop and market more pedagogically engaging tools and resources. Finally, in keeping with other current research, this survey forecasts enormous growth in online certification and recertification programs, as well as some growth in associate's and master's degree programs during the coming decade.

Managing Change on Campus: Academic Program Development and Assessment. (2009). Eduventures, Inc. White Paper. Retrieved from <http://learn.eduventures.com/rs/eduventures/images/Eduventures%20White%20Paper%20-%20Program%20Development%20and%20Assessment.pdf>.

Between now and 2016, adult learners will be the fastest growing student segment in higher education. To be successful in serving this population, however, schools will need to provide online and part-time enrollment options that are increasingly in demand for traditional and adult students alike. Eduventures' market projections show that the online student market continues to grow steadily. Online enrollments represent approximately 10.6 percent of all students today and a projected 18 percent in 2013.

Through this paper, Eduventures provides insight into effective strategies for researching new academic programs and for assessing existing ones. This includes:

- Today's major national trends, such as
 - rapid growth in the number of adult learners and online enrollments; "Some of the fastest growing and economically successful divisions of colleges and universities across the country are those focused on high-quality adult education," and

- how to address an anticipated educational workforce shortage.
- Case studies that exemplify how strong new program development can help colleges and universities save money and increase likelihood of a program's success. For example, a dean who needed to demonstrate the feasibility of an online program to secure funding conducted with Eduventures an online survey of more than 500 regional teachers. Of those surveyed, 81 percent indicated an interest in online programming and the program was subsequently funded.
- A basic assessment model for objectively evaluating programs at a given institution.

Thorough program development and assessment processes will be crucial to colleges and universities in the coming years. Under pressure to operate efficiently, respond to student and employer demands, and keep the university moving forward, university leaders need objective and systematic processes to inform decisions about the program portfolio.

Power, M. (2008) The Emergence of a Blended Online Learning Environment. Retrieved from http://jolt.merlot.org/vol4no4/power_1208.htm.

Based directly on field observations and documented case studies, this study introduces the *blending online learning environment* concept and identifies its import to higher education, alluding also to possible positive effects on the field of instructional design and technology. It is felt that this study contributes to sparse yet necessary research for sustainable and cost-effective university outreach as well as to effective human and material resources deployment.

More specifically, this study addresses a need for a teaching and learning environment that accurately reflects faculty realities, providing both a resource-rich structure and multiple opportunities for both real-time and differed dialog between learners as well as between learners and faculty. It suggests that there is a need for balance between the aims of administration, faculty limits and learner needs and it establishes bottom-line requirements for structure and dialogue in a workable teaching-learning environment. It is posited that this can be achieved by blending available information and communication technologies (ICT) to provide online learners with a complete OL environment, faculty with a feasible alternative to restrictive on-campus teaching and administration with the means to manage responsible outreach.

Despite some research design-related limits (limited sample, on-going studies), the findings and related theorizations in this article may enable designers, faculty members as well as administrators to better understand and act upon some of the basic issues surrounding the design, redesign and delivery of blended online learning.

Rickard, W. (2010) The Efficacy (and Inevitability) of Online Learning in Higher Education. Pearson. Retrieved from www.pearsonlearningsolutions.com/online-learning/downloads/Online%20Learning%20Whitepaper.pdf.

No longer viewed solely as an alternative to traditional programs, online learning has become an integral aspect of all types of mainstream education and training environments, including K12, higher education, corporate, government, military, and home schooling. The ability to access high-quality, academically rigorous anywhere/anytime programs, is today's new academic gold standard. At present, the globalization of learning is an inescapable trend that underscores the need for standards of quality to ensure the ongoing development of programs of excellence grounded in reliable research and pedagogy.

In this report, Rickard examines the efficacies (access/quality/cost framework), pedagogical impact, and challenges of online education. Of particular note is her focus on how online learning addresses a multitude of needs, issues, and obstacles that challenge learning organizations and students alike. These include:

- providing simple and efficient ways for teachers to respond to student needs,
- accommodating diverse learning styles,
- increasing ease of content and course management,
- putting students at the center of the learning process,
- meeting the needs of underserved students – those of color, those with low incomes, those needing skills remediation, and adult learners returning to school, and
- addressing the reality of limited classroom space.

Smith, S.H., Samors, R., Mayadas, A.F., & (2008). Positioning Online Learning as a Strategic Asset in the Thinking of University Presidents and Chancellors. *Journal of Asynchronous Learning Networks*. Retrieved from <http://sloanconsortium.org/jaln/v12n2/positioning-online-learning-strategic-asset-thinking-university-presidents-and-chancellor>.

At the heart of this study was a series of interviews with university leaders on the topics of online learning and their strategic thinking relative to this learning format. Upon review of their research conversations, the authors found that the broadest impact that online learning might

bring to an institution has not crystallized conceptually for strategy leaders in college and university settings. In many institutions, the move toward online learning is led by a middle to upper-middle level central administrator or faculty visionary intent on educating their university's leadership on the potential of embracing new and emerging technologies.

Although the presidents interviewed were often familiar with or had been briefed on developing online learning trends and their operational importance, the authors perceived a clear need for the positioning of online education as a strategic asset, rather than simply “another way of doing business” in the 21st Century, an asset that brings positive influence in a *systemic* way to multiple facets of the modern-day university. One discovery that surprised the interviewers was the consistent lack of significant interest in expanding online learning into the international market. Even when it was reiterated that anyone, anywhere can take the online learning courses or degree programs, the discussants' focus remained on specific state, regional or national markets or needs.

The presidents and chancellors strongly affirmed the importance of online education as a means for “increasing student access,” along with a significant desire to “attract students from outside the traditional service area.” Although the term “access” was not defined in detail for the respondents, commentary provided in both the qualitative and quantitative studies show that university leaders are clearly moving beyond a mindset which links distributed education primarily to recruitment and financial gain, and more commonly viewing access in broader ways. This view of the present and future of online education clearly impacts discussions across the college or university on topics of financial aid, transfer credit acceptance, minorities, academic continuity, student services, and transnational education—and will engender policy development and debate for years to come.

Swan, K. (2003). Learning effectiveness: what the research tells us. In J. Bourne & J. C. Moore (Eds) *Elements of Quality Online Education, Practice and Direction*. Needham, MA: Sloan Center for Online Education, 13-45.

This paper reviews the literature on the learning effectiveness of asynchronous online environments. It looks beyond the commonly accepted findings of no significant differences in learning outcomes between online and traditional courses to examine that literature in terms of forms of interactivity, a feature of online environments that might matter or be made to matter in learning. It thus explores and is organized according to learner interactions with course content, student interactions with instructors, and interactions among classmates in online course environments. More recent notions of interactions with computer and course interfaces and virtual interaction are also briefly examined. The chapter concludes with a summary of what the

research tells us and its implications for online learning. [See also Swan summary in Learning Outcomes section.]

US Department of Education. (2010). National Education Technology Plan (NEPT). Retrieved from www.ed.gov/technology/netp-2010.

The National Education Technology Plan, *Transforming American Education: Learning Powered by Technology*, calls for applying the advanced technologies used in our daily personal and professional lives to our entire education system to improve student learning, accelerate and scale up the adoption of effective practices, and use data and information for continuous improvement. Focused on the goal of raising the proportion of college graduates from 39 percent to 60 percent, the plan calls for:

- Cost-effective and cost-saving strategies that improve learning outcomes and graduation rates,
- Embracing innovation, prompt implementation, regular evaluation, and continuous improvement, and
- Leveraging technology to provide engaging and powerful learning experiences, content and resources.

The plan lays out an increased role for online learning in K–12, and calls for colleges of education to include online learning in their programs in order to help teachers use technology to teach today’s students. Their students are digital natives who have a global Internet identity. It presents five goals with recommendations for states, districts, the federal government, and other stakeholders. Each goal addresses one of the five essential components of learning powered by technology: learning, assessment, teaching, infrastructure, and productivity.

Laws, R. D., Howell, S. L., & Lindsay, N. K. (2003). Scalability in Distance Education: “Can We Have Our Cake and Eat It Too?” *Online Journal of Distance Learning Administration*, Vol. VI, No. IV.

This study describes the substantial investment BYU has in online learning, its growth and cost effectiveness, then turns to the question of how to continue to scale courses for students without sacrificing quality of instruction, student/faculty interaction, retention or profitability. Scalability is defined as increasing enrollments while still being profitable or financially self-sustaining. BYU’s Independent Study program has experienced strong growth in university enrollments (12,995 in 1996, and 24,380 in 2002) and unprecedented growth in its high school enrollments (24,696 in 1996, and 52,001 by end of 2002).

At BYU, administrators have evaluated the effectiveness of their highly automated distance education classes, determining that more interactivity requires a trade-off with the accompanying demands. This article provides perspectives on these issues and then proposes four models that increase interactivity while allowing for scalability. The four models include: Direct Student-Faculty Interaction Model, On-demand Support, TA Course Development/Quasi Mentor Afterward, and Student-to-Student Mentoring Requirement (Service Learning). The article includes helpful detail about the issues and strategies surrounding quality online instruction, as well as cost and logistical information about each proposed model.

“The Future of Higher Education: How Technology Will Shape Learning.” (2008). A Report from the Economist Intelligence Unit, Sponsored by the New Media Consortium.

Research based on a global online executive survey and in-depth interviews of 289 executives, 189 from higher education and 100 from corporate settings. The U.S. accounted for about one-half of respondents, 69 from Europe and the rest Asia-Pacific and the rest of the world. Deans and other faculty member accounted for 86 percent of those surveyed from academic institutions. This research examines the role of technology in shaping the future of higher education. The major findings are as follows:

- Technology has had—and will continue to have—a significant impact on higher education. In fact, technology will become a core differentiator in attracting students and corporate partners.
- Online learning is gaining a firm foothold in universities around the world. Two-thirds of academics responding say their institutions offer online courses. Many consider online learning key to advancing their mission—reaching people who might otherwise not be able to access it.
- Corporate-academic partnerships will form an increasing part of the university experience.
- University respondents view technology as having a largely positive impact on their campuses, but acknowledge operational challenges that hinder realizing full benefits.
- Higher education is responding to Globalization. Respondents say that having an overseas presence will be the norm for the majority of universities over the coming year.

The survey research and interviews provide additional detail and case studies on how technology is changing the classroom, the expanding role of online learning, global competition and the workforce, collaboration to extend corporate-university partnerships, and understanding challenges in rewiring education.