



Evidence-Based Practices in Online and Distance Learning: A Research Review for Educators during the COVID-19 Pandemic

As of March 17, 37 states across the nation closed the doors of their schools. In many locations, the announced shutdown is for a few weeks, but many experts are suggesting that closures could last longer as America and the world wrestle with COVID-19. This new reality has set districts scrambling, trying to find alternative mechanisms for providing continuous learning and reducing the potentially devastating impact of learning loss.¹

Many districts are moving to online learning. Some schools have adopted online curricula, providing various degrees of coherence. Others are scrambling to assemble collections of aligned activities and learning experiences.

What we know is that many of us in traditional public education have little experience with purely online learning. Face-to-face, classroom-embedded learning has served as our fundamental food group for years. Even our most technologically-savvy teachers, the ones who have used online resources to extend and deepen learning, have been doing so in the context of face-to-face instruction.

There are places where online learning is more developed, and where we might be able to glean lessons that might help educators facing these new realities. Alternative, online high schools have existed in many states for years. Some school districts have offered online courses as supplements to their core curricula. Numerous universities have deep experiences offering courses or entire programs virtually. Online learning opportunities have become more common, with 20% of students grades 5-12 self-reporting that they have taken an online or distance learning course on their own or at school.²

Online education represents a “fundamental change [in] the relationship that students, teachers, parents, and the community have with their educational institutions and with one another” and optimally involves a deep investment of professional learning to develop excellent online instructors.³ There is no doubt we are asking our individual educators and the systems within which they work for rather seismic shifts.

Scholars have also begun to develop a research base that can inform our work in this area. First of all, it is important to note that the research is incomplete. For example, until now there have been few purely virtual learning experiments for early elementary school. Also, in many ways the research provides general guidance, but it won't tell us exactly what to do tomorrow.

Below are key themes in the literature that can inform your transitions to online learning.

Effectiveness of Online Learning

- There is evidence that students in certain online conditions can perform as well or slightly better than those students learning the same materials through traditional face-to-face instruction.⁴
- There are multiple modes of online learning, and research suggests that those forms that are designed to be collaborative or instructor-directed are more effective than those where students are expected to learn independently.⁵
- Online learning seems to have consistent effects across a wide range of content and learner types.⁶
- Blended instruction that combines online and face-to-face elements had a larger advantage than purely online instruction.⁷

Research on Effective Practices in Online Learning

- **What is the endgame?** Instructional clarity and intentionality are critical. As is the case in traditional classroom instruction, it is essential for educators to design lessons and use online resources with defined learner outcomes.⁸



- **Self-regulation and Metacognition.** Online learning seems to be optimized when self-regulation is central to the learning experience. More specifically, one meta-analysis suggests that online learning can be enhanced by “giving learners control of their interactions with media and prompting learning reflection.” Research studies seem to suggest that online learning experiences that trigger learner activity, self-monitoring, and increased understanding are effective.⁹
- **Clarify the Rules of Engagement.** Each fall teachers spend time defining the expectations and the routines in the classroom. This is no less important online. Research suggests that online learning is more effective when students understand the specific behaviors and expectations that will assist the learning process.¹⁰
- **Collaboration and Interaction over Isolation.** Research suggests that online learning is more effective when students collaborate than when working in isolation.¹¹ Optimally, students are still engaged in a directed, social learning experience, as opposed to toiling extensively in seclusion.
- **Alignment.** As counter-intuitive as it sounds, there is little evidence that inclusion of more media, on average, enhances online learning.¹² This is not to suggest that media cannot be effective, in fact it can animate ideas, provide different modalities, and spark student interest. However, it is important to select aligned resources and not overwhelm students with too much media content.
- **Instructional Tasks Matter.** Evidence suggests that the use of online quizzes does seem more effective than other online learning experiences, such as assigning homework.¹³ Care should be taken to design instructional tasks that stimulate active learning and deep student thinking.
- **Feedback, Feedback, Feedback.** Feedback consistently shows up as one of the most effective instructional strategies available to educators, and this is no less true in online learning. Online learning should be designed to allow teachers and peers to provide students feedback that can enhance the learning process, correcting misunderstandings, clarifying expectations, and directing additional learner strategies.¹⁴
- **Show Up and Be Accounted For.** Though educators may be remote, it is important they maintain social presence in the learning process.¹⁵ Instructors should provide feedback, communicate regularly, model participation, and create an inviting tone.¹⁶

The learning curve over the coming weeks and months will be steep, and students and educators deserve evidence-based guidance for how we can provide alternative (and even optimal) modes of learning and teaching.

¹Cooper, H., Nye, B, Charlton, K., et al. (1996). The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review. *Review of Educational Research*. AREA

²*Learning in the 22st Century: A National Report of Online Learning (2019)*. Project Tomorrow & Blackboard. <https://tomorrow.org/speakup/learning21Report.html>

³National Education Association Guide to Teaching Online Courses. National Educational Association: Washington, D.C. <http://www.nea.org/assets/docs/onlineteachguide.pdf>

⁴Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2010). [Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies](#). US Department of Education. Office of Planning, Evaluation, and Policy Development. Policy and Program Studies Service. ED-04-CO-0040.

⁵Ibid.

⁶Ibid.



⁷Ibid.

⁸Froyd, J. (2008, June). [White paper on promising practices in undergraduate STEM education.](#); Caulfield, J. (2011). How to Design and Teach a Hybrid Course. Sterling, VA: Stylus Publishing.

⁹Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2010). [Evaluation of Evidence- Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.](#) US Department of Education. Office of Planning, Evaluation, and Policy Development. Policy and Program Studies Service. ED-04-CO-0040.

¹⁰Bransford, J. D., Brown, A., & Cocking, R. (Eds.). (1999). How people learn: Mind brain, experience and school. Washington, DC: National Academy Press.

¹¹Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2010). [Evaluation of Evidence- Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.](#) US Department of Education. Office of Planning, Evaluation, and Policy Development. Policy and Program Studies Service. ED-04-CO-0040.; Schutte, J. (1996). Virtual teaching in higher education. Retrieved from <http://media.sabda.org/alkitab-1/Pdfs/Schutte-VirtualTeachinginHigherEd.pdf>.

¹²Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2010). [Evaluation of Evidence- Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.](#) US Department of Education. Office of Planning, Evaluation, and Policy Development. Policy and Program Studies Service. ED-04-CO-0040.

¹³Ibid.

¹⁴Hattie, John (2008). Visible learning. Abingdon, Oxon: Routledge.; *Thalheimer, W. (2008, May). Providing Learners with Feedback—Part 1: Research-based recommendations for training, education, and e-learning.* Retrieved from: https://www.worklearning.com/wp-content/uploads/2017/10/Providing_Learners_with_Feedback_Part2_May2008.pdf; Kassop, M. (2003). [Ten ways online education matches, or surpasses, face-to-face Learning.](#)

¹⁵Savery, J. R. (2005). [BE VOCAL: Characteristics of Successful Online Instructors.](#) Journal of Interactive Online Learning, 4(2).

¹⁶Garrison, D. R., & Vaughan, N. D. (2008) Blended learning in higher education: Framework, principles, and guidelines. San Francisco, CA: Jossey-Bass.