REL Appalachia Ask A REL Response

College and Career Readiness, Online Courses, Postsecondary
February 2019

Question:

What does research show about online career and technical education (CTE) programs and their outcomes, including those offered by K–12 systems and those offered by community colleges?

Response:

Thank you for your request to our REL Reference Desk regarding evidence-based information about online CTE programs. Ask A REL is a collaborative reference desk service provided by the 10 Regional Educational Laboratories (RELs) that, by design, functions much in the same way as a technical reference library. Ask A REL provides references, referrals, and brief responses in the form of citations in response to questions about available education research.

Following an established REL Appalachia research protocol, we searched for peer-reviewed articles and other research reports on online CTE programs. We focused on identifying resources that specifically addressed the implementation and impact of online CTE programs. Our search yielded very few references about online CTE programs in high schools, so the references below include research on online or blended CTE programs at both the high school and community college levels. The sources included ERIC and other federally funded databases and organizations, research institutions, academic research databases, and general Internet search engines. For more details, please see the methods section at the end of this document.

The research team did not evaluate the quality of the resources provided in this response; we offer them only for your reference. Also, the search included the most commonly used research databases and search engines to produce the references presented here, but the references are not necessarily comprehensive, and other relevant references and resources may exist. References are listed in alphabetical order, not necessarily in order of relevance.

References

Benson, A. D., Johnson, S. D., Taylor, G. D., Treat, T., Shinkareva, O. N., & Duncan, J. (2005). Achievement in online and campus-based career and technical education (CTE) courses. *Community College Journal of Research and Practice, 29*(5), 369–394. Abstract retrieved from https://eric.ed.gov/?id=EJ692014; full text available at

https://www.researchgate.net/publication/233311954_Achievement_In_Online_And_Campus-Based_Career_And_Technical_Education_CTE_Courses

From the abstract: "Community colleges are actively involved in distance-learning programs in Career and Technical Education (CTE). Over 76% of community colleges offer some form of distance learning in CTE. Over the years, only a few isolated studies have compared the effectiveness of distance CTE courses to traditional face-to-face courses. Typically, the findings of previous studies indicate no significant differences between the two methods. This study was designed to address the lack of systematic studies of this question. It also examines how student motivation and learning strategies differ for campus-based and online students. Finally, it investigates how online and campus-based courses differ in terms of course interaction, content organization, student support, and transactional distance (i.e., feelings of closeness to the instructor and the program)."

Carver, D. L., & Kosloski, M. F. (2015). Analysis of student perceptions of the psychosocial learning environment in online and face-to-face career and technical education courses. *Quarterly Review of Distance Education, 16*(4), 7–21. Abstract retrieved from https://eric.ed.gov/?id=EJ1143795; full text available at https://go.galegroup.com/ps/i.do?p=AONE&sw=w&u=googlescholar&v=2.1&it=r&id=GALE%7CA458641692&sid=googleScholar&asid=ad399c0a44d07a4d3b5982146d664cff

From the abstract: "This study analyzed student perceptions of the psychosocial learning environment in online and face-to-face career and technical education courses, and used survey data from a school district in Washington state. A Mann-Whitney 'U' test was used to measure variability and compare the mean scores for a series of psychosocial learning environment scales between online and face-to-face environments to determine if differences exist. Analysis of the data indicates that in the areas of active learning and autonomy, students perceive online education as offering more benefit than face-to-face education. In the areas of student interaction, collaboration, and enjoyment, student perceptions favor the face-to-face environment."

Chang, C., Shu, K., Liang, C., Tseng, J., & Hsu, Y. (2014). Is blended e-learning as measured by an achievement test and self-assessment better than traditional classroom learning for vocational high school students? *International Review of Research in Open and Distance Learning, 15*(2), 213–231. Retrieved from https://eric.ed.gov/?id=EJ1030111

From the abstract: "The purpose of this study is to examine the effects of blended e-learning on electrical machinery performance (achievement test and self-assessment). Participants were two classes of 11th graders majoring in electrical engineering and taking the electrical machinery class at a vocational high school in Taiwan. The participants were randomly selected and assigned to either the experimental group (n = 33) which studied through blended e-learning or the control group (n = 32) which studied through traditional classroom learning. The experiment lasted for five weeks. The results showed that (a) there were no significant differences in achievement test scores between blended e-learning and traditional learning; (b) students in the experimental group obtained significantly higher scores on self-assessment than students in the control group; (c) students' scores on self-

assessment were significantly higher after studying through blended e-learning than before. Overall, blended e-learning did not significantly affect students' achievement test scores, but significantly affected their self-assessment scores."

Githens, R. P., Sauer, T. M., Crawford, F. L., & Wilson, K. B. (2012). Online occupational education in community colleges: Prevalence, programming, and connection with workforce development needs. *Career and Technical Education Research, 37*(1), 35–56. Abstract retrieved from https://eric.ed.gov/?id=EJ979569; full text available at https://rodgithens.files.wordpress.com/2012/12/online-occ-educ.pdf

From the abstract: "This study examined the current state of online occupational programs in community colleges and explored issues related to institutional, economic, and social indicators that influence (a) the offering of online programs and (b) the programmatic connection to workforce development needs. The study is based on a random sample of 321 institutions in the United States. This project is the first national study categorizing online occupational programs according to the Career Clusters and Career Pathways classification scheme. Although research has shown that most institutions offer online occupational courses, only 47.5% of colleges in the sample offered credit-granting online occupational programs. Additionally, despite research finding that skill-based programs requiring manipulative skill development can be successfully taught online, this study found that few such programs exist. Finally, our research indicated that occupational program development is not driven by statewide economic indicators, such as the state's fastest growing occupations, suggesting a moderate responsiveness to states' workforce development needs."

Means, B., Toyama, Y., Murphy, R. F., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record, 115*(3), 1–47. Abstract retrieved from https://eric.ed.gov/?id=EJ1018090; full text available at https://www.sri.com/sites/default/files/publications/effectiveness_of_online_and_blended_learning.pdf

*From the abstract: "*Earlier research on various forms of distance learning concluded that these technologies do not differ significantly from regular classroom instruction in terms of learning outcomes. Now that web-based learning has emerged as a major trend in both K–12 and higher education, the relative efficacy of online and face-to-face instruction needs to be revisited. The increased capabilities of web-based applications and collaboration technologies and the rise of blended learning models combining web-based and face-to-face classroom instruction have raised expectations for the effectiveness of online learning. This meta-analysis was designed to produce a statistical synthesis of studies contrasting learning outcomes for either fully online or blended learning conditions with those of face-to-face classroom instruction."

Metz, K. (2010). Benefits of online courses in career and technical education. *Techniques: Connecting Education and Careers, 85*(6), 20–23. Retrieved from https://eric.ed.gov/?id=EJ909583

From the introduction: "Although only a very small portion of the U.S. K–12 students are taking online courses, interest in and attention to online learning is growing fast and furious. Visionaries believe this online learning movement is just the beginning of a transformation of the school system for the first time in more than 50 years, when the current traditional industrial aged one-size-fits-all system was implemented. The interest in the online learning movement is seen by the rapid increase in enrollment in online courses, especially in academics. Online learning is moving at a slower pace in career and technical education (CTE) than in general education; but it is sure to catch up as learners demand alternatives to the traditional classroom, access to classes not available locally, education on demand, and learning that appeases the digital age student. This article discusses the benefits of online courses in CTE."

Additional Ask A REL Responses to Consult

Ask A REL Mid-Atlantic at Mathematica Policy Research. (2017). *What other vocational high schools use blended learning in career and technical education (CTE) areas and how successful have they been with raising achievement?* Retrieved from https://ies.ed.gov/ncee/edlabs/regions/midatlantic/askarel_23.asp

Additional Organizations to Consult

Advance CTE: State Leaders Connecting Learning to Work: https://careertech.org/

From the website: "*Advance CTE: State Leaders Connecting Learning to Work* is the longest-standing national non-profit that represents State Directors and state leaders responsible for secondary, postsecondary and adult Career Technical Education (CTE) across all 50 states and U.S. territories. Advance CTE was formerly known as the National Association of State Directors of Career Technical Education Consortium (NASDCTEc).

Our Mission is to support visionary state leadership, cultivate best practices and speak with a collective voice to advance high-quality CTE policies, programs and pathways that ensure career success for each learner.

Our Vision is to transform and expand CTE so that each learner – of any background, age and ZIP code – is prepared for career and college success through state leadership, advocacy and partnerships."

National Research Center for Career and Technical Education (NRCCTE) at the Southern Regional Education Board (SREB): http://www.nrccte.org/

From the website: "The NRCCTE at SREB is committed to providing evidence-based solutions to the most vexing problems confronting CTE today, including how to better engage students in the school experience; how to improve academic as well as technical

achievement; and how to improve the transition of college and career ready young people from high school to continuing education beyond high school."

Methods

Keywords and Search Strings

The following keywords and search strings were used to search the reference databases and other sources:

- ("career technical education" OR "career and technical education" OR vocation*) AND (online OR virtual OR blended OR e-learning)

Databases and Resources

We searched ERIC, a free online library of more than 1.6 million citations of education research sponsored by the Institute of Education Sciences (IES), for relevant resources. Additionally, we searched the academic database ProQuest, Google Scholar, and the commercial search engine Google.

Reference Search and Selection Criteria

In reviewing resources, Reference Desk researchers consider—among other things—these four factors:

- Date of the publication: Searches cover information available within the last ten years, except in the case of nationally known seminal resources.
- Reference sources: IES, nationally funded, and certain other vetted sources known for strict attention to research protocols receive highest priority. Applicable resources must be publicly available online and in English.
- Methodology: The following methodological priorities/considerations guide the review and selection of the references: (a) study types—randomized controlled trials, quasi experiments, surveys, descriptive data analyses, literature reviews, policy briefs, etc., generally in this order; (b) target population, samples (representativeness of the target population, sample size, volunteered or randomly selected), study duration, etc.; (c) limitations, generalizability of the findings and conclusions, etc.
- Existing knowledge base: Vetted resources (e.g., peer-reviewed research journals) are the primary focus, but the research base is occasionally slim or nonexistent. In those cases, the best resources available may include, for example, reports, white papers, guides, reviews in non-peer-reviewed journals, newspaper articles, interviews with content specialists, and organization websites.

Resources included in this document were last accessed on February 4, 2019. URLs, descriptions, and content included here were current at that time.