



The Use of Distance Learning in Occupational Health and Safety Training: Assessing Effectiveness and Sustainability in the Context of the COVID-19 Pandemic

Executive Summary

Sue Ann Corell Sarpy, Ph.D
Alicia Stachowski, Ph.D.
Gary Gustafson
Steve Surtees

January 2021

8484 Georgia Avenue
Suite 1000
Silver Spring, MD 20910

PHONE: 301.578.8500

FAX: 301.578.8572

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Introduction

The COVID-19 pandemic has caused great disruptions and uncertainty to organizations worldwide. The rapidly instituted changes to workplaces—for example, the immediate transition from in-person interaction to virtual and online communication—are now an everyday part of the workplace for many of us. Trainers, including those in the construction industry, were required to rapidly adapt health and safety and skill-based training which relies on in-person interaction and hands-on learning, to virtual format. The urgency and abruptness of the transition to distance learning formats and subsequent reliance on advanced technology has left users grappling with a series of issues: unfamiliar platforms and complicated training guides; lack of access to online resources; a lack of consistency of platforms used across organizations; need for clarity for compliance and ethical considerations; and a scarcity of readily available evaluation resources to assess the effectiveness of transitioning to the distance learning formats. These concerns highlight the need for systematic evaluations to monitor the effectiveness of distance learning training methods and assess the on-going quality improvements made when gaps are identified and addressed. Further, the dynamic nature of the pandemic highlights the need to share lessons learned and best practices as the training systems evolve. This is of particular importance in the occupational health and safety domain, in which training is being designed and delivered to meet emerging worker safety needs during the pandemic.

Purpose

The current evaluation project involves **a comprehensive system designed to assess effectiveness of the rapid transition to synchronous online training in the occupational health and safety domain**. It addresses not only the effectiveness of the safety training content and distance learning format, but also the feasibility of integrating the distance learning format into future training efforts. The evaluation system was designed to investigate: (1) comparisons of safety training delivered in a face-to-face versus synchronous online format; (2) effectiveness of newly developed online COVID-19 trainings in addressing emerging worker safety needs; and (3) best practices and lessons learned for occupational health and safety training delivered in distance learning format.

Methods

The methodology employed is based on an established evaluation system designed by Sarpy and Associates. This evaluation process is strategically designed to include: (1) use of a **mixed-method approach** that incorporates **qualitative and quantitative data**; (2) a **multiple stakeholder system** that will provide 360 degree feedback of effectiveness from major stakeholders; (3) **identification of best practices/lessons learned** from project findings; and (4) **general recommendations to enhance programmatic success and sustainability**. It should be noted that this evaluation process has previously been used to evaluate the effectiveness and impact of online and face-to-face occupational health and safety training programs, emergency management and disaster response, and resiliency training programs nationwide. Sarpy and Associates worked closely with CPWR – The Center for Construction Research and Training (CPWR) to apply this methodology to the following studies.

Study 1: Comparative Study of Face-to-face versus Distance Learning Format on Training Outcomes.

Using the process described above, an evaluation was developed to provide direct comparisons of the effectiveness of a worker health and safety training course delivered in a traditional face-to-face format with the same course delivered in a synchronous online format. CPWR's Infection Control Risk Assessment (ICRA) Awareness training program was selected for evaluation because it has been presented in face-to-face format for a number of years and was modified by CPWR to a distance learning

format for presentation during the COVID-19 pandemic. CPWR course evaluations, administered to all course participants directly following training, were analyzed to compare the effectiveness of instructor and teaching/learning methods, safety-related knowledge and skill gains, and the course's overall effectiveness in improving the knowledge, skills, and confidence to work safely.

Results of analyses revealed that participants in the face-to-face courses reported, on average, statistically significantly higher ratings of: (1) Instructor Effectiveness; (2) Teaching/Learning Methods; and (3) Overall Effectiveness in developing the knowledge, skills, and confidence to work safely. However, it should be noted that while face-to-face delivery was rated more highly, respondents indicated that, on average, both delivery formats were highly effective. Importantly, no significant differences in specific safety-related knowledge and skills were reported by participants in the face-to-face versus distance learning formats, suggesting that high levels of learning occurred regardless of format.

Study 2: Online Training Developed During Pandemic. A complementary study was conducted to assess the effectiveness of two newly developed CPWR COVID-19 courses (COVID-19 and the Construction Industry Awareness; ICRA/COVID-19 Awareness) delivered in a synchronous online format to address emerging safety needs. The evaluation was conducted three to six months after the initial training session and provides additional information to determine whether the online training effectively transferred to improved job site safety during the COVID-19 pandemic. Study 2 examined the effectiveness of the synchronous online format in addressing worker health and safety training needs in real-time during the pandemic.

Online evaluation questionnaires were designed and administered to all participants who received the training (workers, trainers, union representatives) as well as the CPWR instructors who delivered the training. Results of the evaluation demonstrated high levels of effectiveness for the synchronous online training, both for those receiving the training as well as those CPWR trainers who provided the training. The respondents reported, on average, that the training had resulted in not only high levels of safety-related knowledge and skill, but also improved their preparedness to work safely and many had used the training on the job. Similarly, they cited that their training-related knowledge and skills were supported on the job, both by their supervisors and the organizations in which they worked. The vast majority of trainers receiving the training reported that they felt prepared to train others using the distance learning format.

While work-related characteristics of the trainees (occupation, trade association membership) and training (type/length of training, month training presented) did not affect outcomes, technology-related characteristics of the trainee did have an impact. Those reporting higher levels of "Comfort in Taking the Training via Distance Learning" gave higher ratings of Instructor, Content, and Format effectiveness as well as higher ratings of Learning, On-the-job Performance, and Support of the training at the worksite than those reporting less Comfort. Similarly, those reporting greater "Skill in Using Distance Learning" gave higher ratings of Instructor and Overall Effectiveness as well as greater Learning than those reporting less Skill. These results suggest that, to engender optimal training outcomes, the technological comfort and skill of the learner should be taken into consideration when designing and delivering training using distance learning.

Best Practices/Lessons Learned and General Recommendations

To gain a greater understanding of the quantitative results, qualitative information was gathered to determine best practices and lessons learned for use of distance learning in occupational health and safety. In addition, meetings with project stakeholders and occupational health and safety training representatives were conducted to gather additional feedback and information. In general, across stakeholders, several

aspects of the distance learning format were cited as most important for success: (1) instructor expertise; (2) use of synchronous online platform (Zoom); (3) up-to-date and relevant content, including its application to the workplace; (4) interaction and discussions of content with participants (breakout groups, polls); and (5) shift to distance learning methods to ensure safety of worker as well as flexibility during the pandemic.

On the other hand, respondents indicated that with remote learning: (1) face-to-face is the gold standard and is recognized as more effective; (2) has limitations regarding the extent to which interactions can be fostered; (3) presents challenges in using hands-on exercises and demonstrations; (4) creates technical issues including accessibility of computer equipment and Internet; and (5) limits the instructor's ability to see non-verbal cues and "read the room" to assess learner understanding.

The qualitative comments and suggestions were synthesized to create general recommendations for enhancing effectiveness of synchronous online training courses, including Tools and Tips for trainers and trainees. The recommendations focus on designing and delivering training sessions in ways that address learner needs and emulate the general principles of adult learning and excellence in instructional design for traditional face-to-face training.

The Trainer Tools and Tips encourage advance planning and organization of training, interactive delivery methods that foster active participation of trainees, and practices for information sharing following the training. These strategies include: (1) gaining information about learner (technological proficiency; accessibility) and workplace needs (occupational; trade) in advance of the session; (2) providing orientation training for participants and trainers that clarifies technology, course expectations, and resources; (3) providing participants access to all course-related information in advance of the training session; (4) convening instructor planning and coordinating meetings to review roles and responsibilities; (5) rehearsing presentations using the technology (including camera), preferably with performance feedback; (6) encouraging trainee engagement and interactions using specific regular interaction/discussions and diverse methods; (7) using co-instructor(s) to assist with technology; (8) creating an open and flexible learning environment; (9) evaluating training to ensure continuous quality improvement; and (10) providing up-to-date, relevant, online resources for participants and trainers. In addition, specific best practices for recommended distance learning methods (e.g., virtual breakout rooms) and Etiquette for Online Success are also provided.

Future Research

The present study provides evidence of the viability of using the distance learning format to successfully deliver occupational health and safety training. It also demonstrates the use of a real-time, comprehensive evaluation process to identify best practices, lessons learned, and general recommendations that can be adopted for continued use of the new technology. Further research is needed to advance our understanding of the trainee characteristics most critical to success in using technology-based training for workers' health and safety. Likewise, additional evaluations of the pedagogical features influencing effectiveness of distance learning formats are needed including the conditions under which it is most effective for occupational health and safety. This information can facilitate strategic decision-making regarding use of distance technology to improve occupational health and safety training systems.

Conclusion

The present evaluation provides preliminary evidence supporting the effectiveness of the distance learning format in delivering occupational health and safety training. Trainee characteristics and training factors affecting effectiveness and impact are identified, as well as recommendations for continuous quality improvement. Finally, suggestions for future research on use of the distance learning technology in occupational health and safety training systems are provided. Taken together, these findings and general recommendations can be used to ensure successful and sustained integration of synchronous online occupational health and safety trainings.

“I feel ICRA related training will become a norm as training in the way we looked at it is changing. I believe 100% in face-to-face training but if we cannot it is a responsibility for us to train them on how to be safe. We sometimes forget about the art of safety. We are forced in this time not to do face to face training, but we have members working today. We had to look at the art side and find the next best avenue. Safety can never stop - no matter what obstacles are put in front of us. Great job for CPWR staff and instructors to adapt and overcome to reach the members.”

Quote from Participant in the ICRA/COVID-19 Awareness Training (April 13, 2020)

