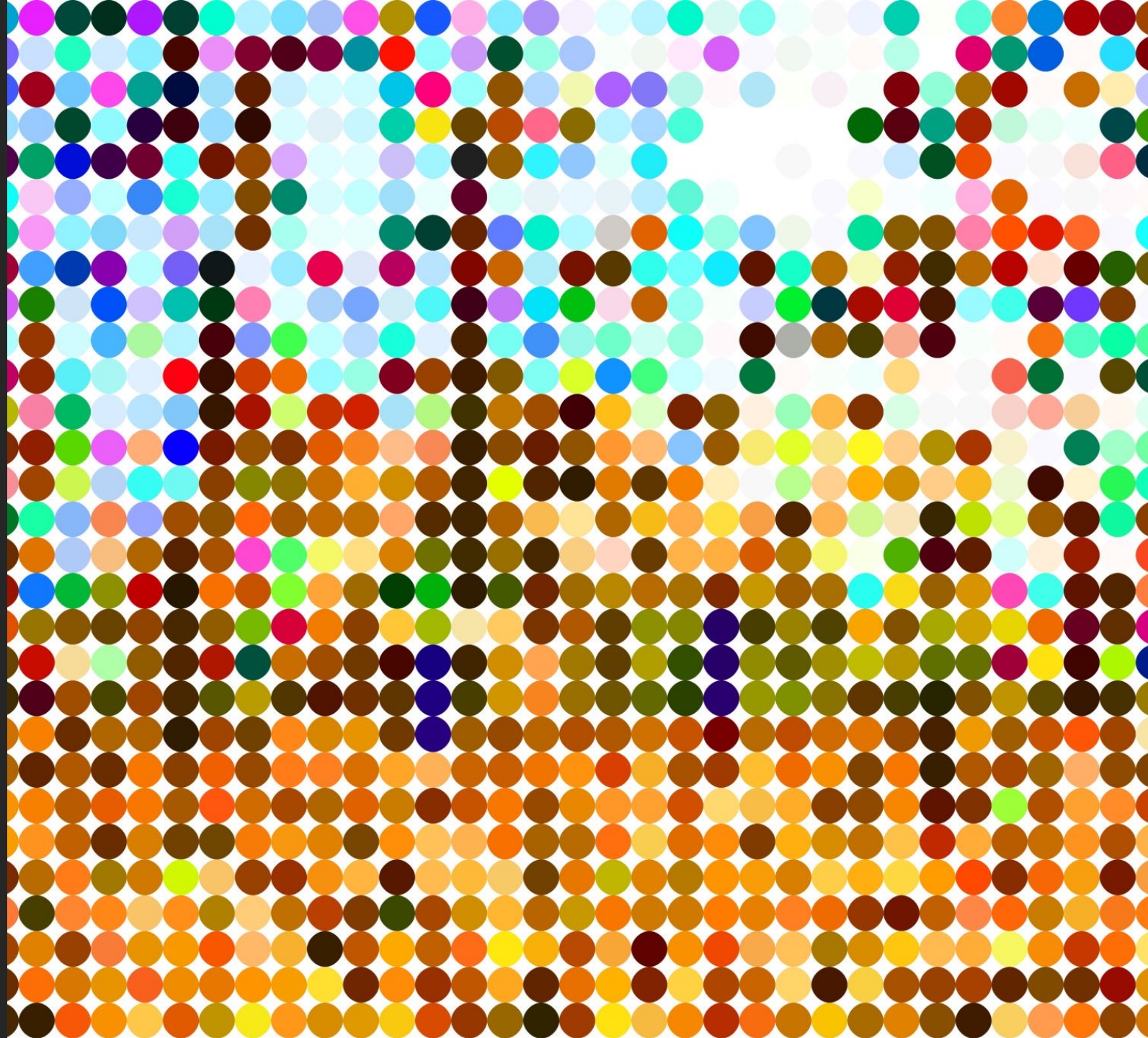

Using Distance Learning for Occupational Health and Safety Training: Examining Effectiveness and Impact on Worker Training in the Construction Industry

Sue Ann Sarpy, M.S., Ph.D.
July 27, 2022



PREVIOUS RESEARCH

CPWR: The Center for Construction Research and Training

Evaluation of the Use of Distance Learning for Courses (ICRA and ICRA/COVID-19)

Compared Distance Learning vs Face-to-Face on Training Outcomes (short- and long-term)

Highly Interactive, Synchronous Distance Learning was Effective

Trainees' Competence with Technology Influenced the Training Outcomes

Created Resources for Distance Learning

<https://www.cpwr.com/wp-content/uploads/RR2021-OHST-distance-learning-COVID.pdf>



CPWR



THE CENTER FOR
CONSTRUCTION
RESEARCH
AND TRAINING

IS DISTANCE
LEARNING
EFFECTIVE
FOR OTHER
WORKER
SAFETY
TRAININGS

Effectiveness and Impact:

Trainings of Longer Duration

Designed and Delivered by Various
Training Providers

Subjective and Objective Measures
of Training Outcomes

Courses Selected For Comparisons

OSHA 510 and OSHA 500 Trainings



Provided Face-to-Face Pre-Pandemic



Modified to Distance during Pandemic



Delivered by Various Training Providers



Dates: November 2018 to June 2021

OSHA 510 and OSHA 500 Courses

OSHA 510: Occupational Safety And Health For The Construction Industry

Covers OSHA standards, policies, and procedures in the construction industry.

Topics include scope and application of the OSHA construction standards, construction safety and health principles, and special emphasis on those areas in construction which are most hazardous.

Minimum Student Contact Hours: 26

No Prerequisites

OSHA 500: Trainer Course In Occupational Safety And Health Standards For The Construction Industry

Course designed for individuals interested in teaching the 10- and 30-hour construction safety and health outreach training program

Students must prepare a presentation on an assigned OSHA construction outreach training program topic and pass a written exam at the end of the course.

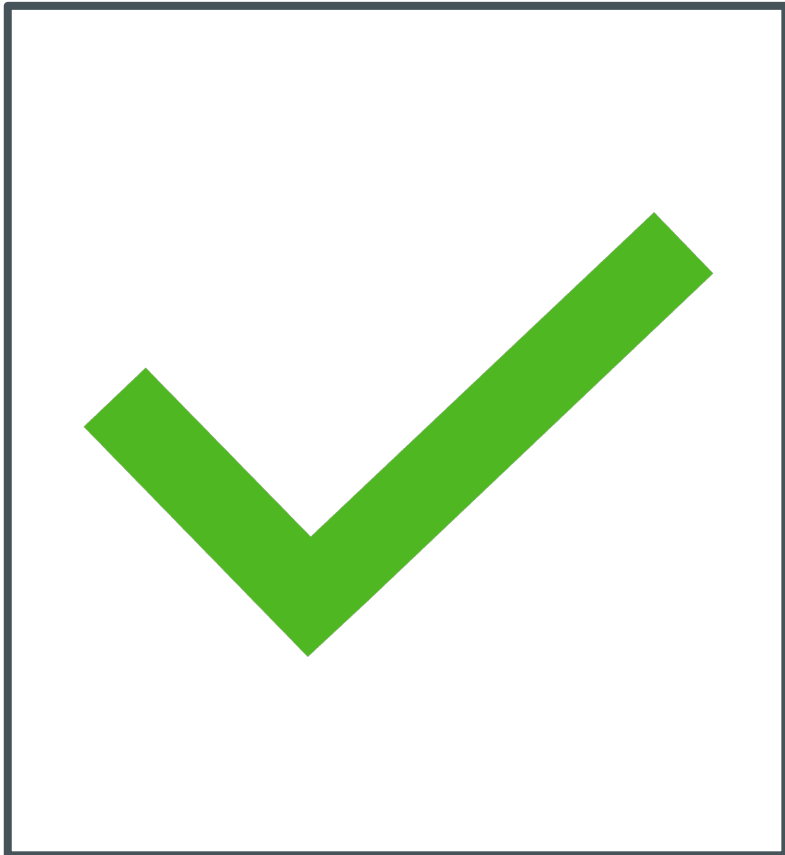
Minimum Student Contact Hours: 26

Prerequisites: OSHA 510 Course Completion and 5 years safety and health work experience in the construction industry

Which Is More Effective? Distance Learning vs Face-to-face

**OSHA 510 AND
OSHA 500**

EVALUATIONS

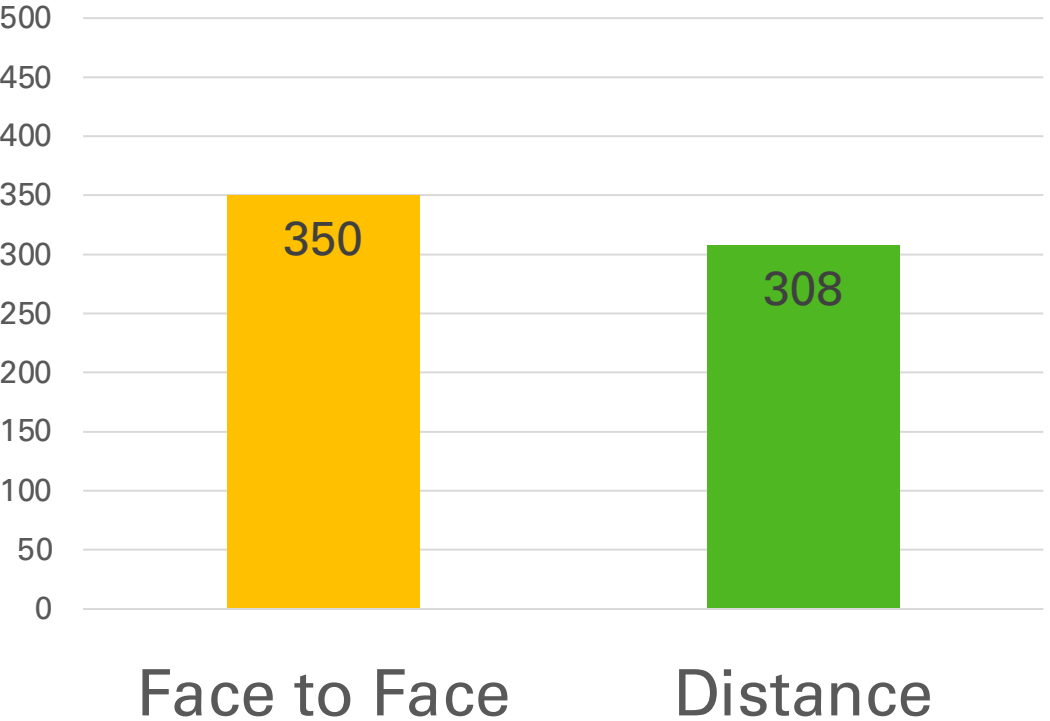


- CPWR Training Evaluation
- 26 items completed immediately following training
- Effectiveness
 - Instructors
 - Training methods/materials
- Learning (safety knowledge and skill)

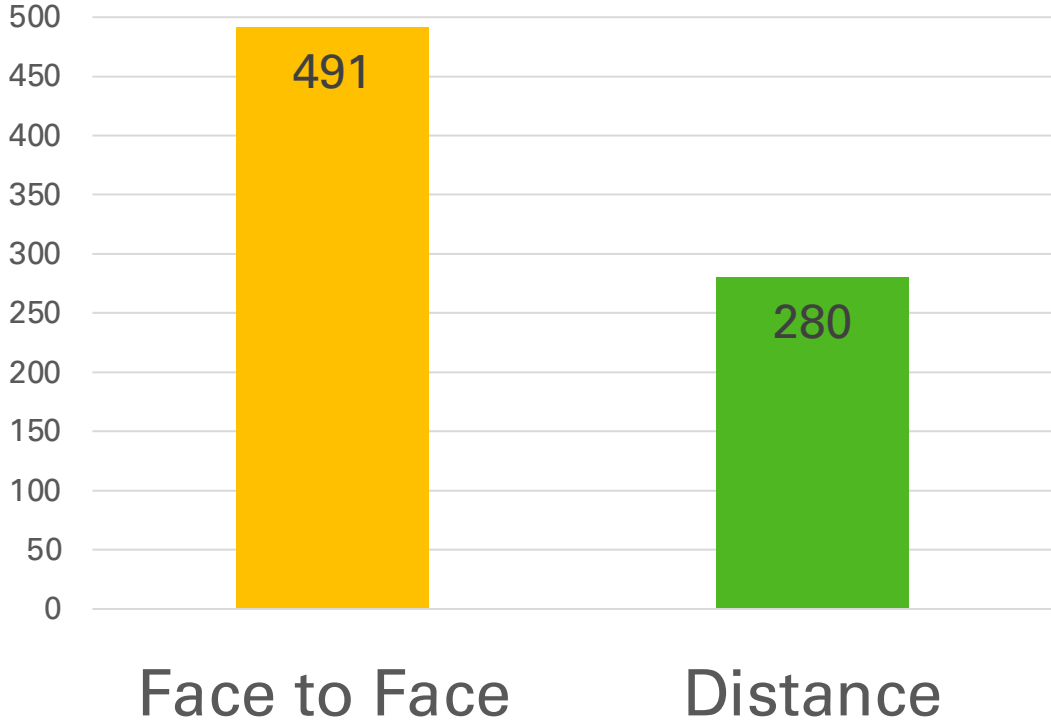
- OSHA 510 test
- OSHA 500 test

How Many Workers Evaluated Trainings?

OSHA 510

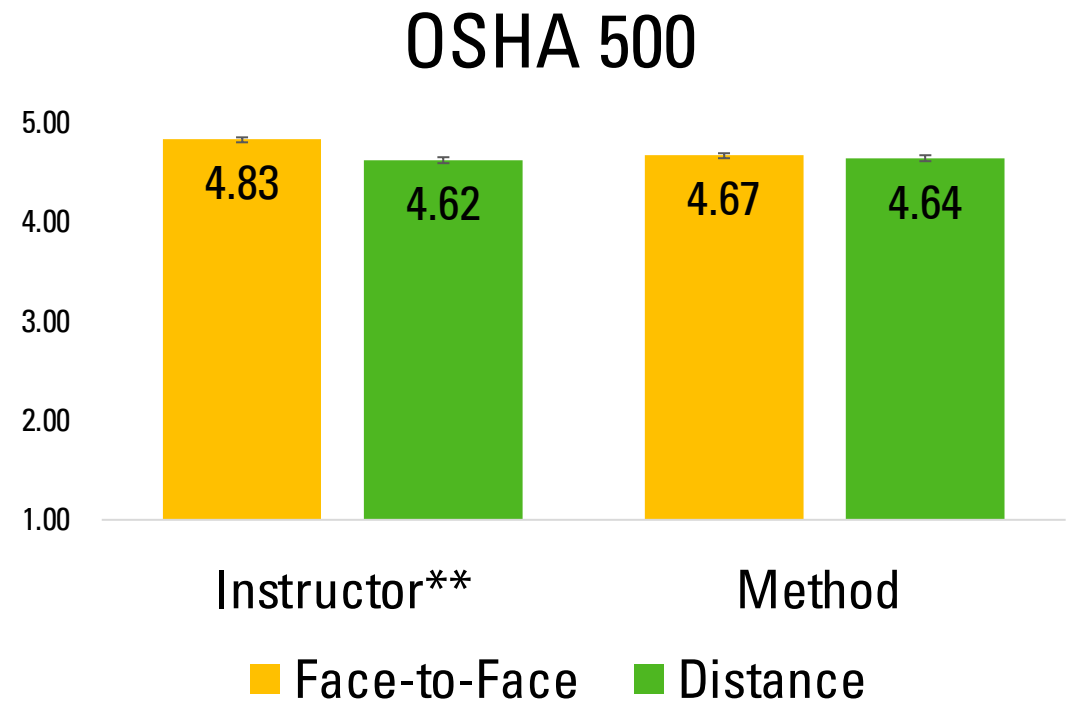
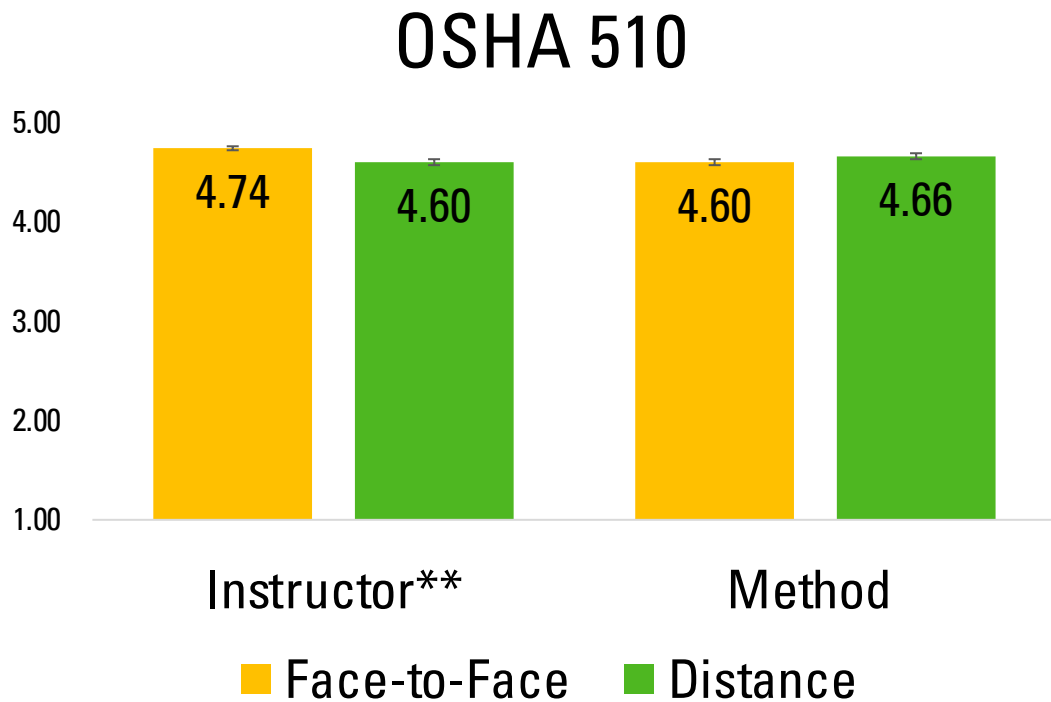


OSHA 500



Ratings Of Effectiveness

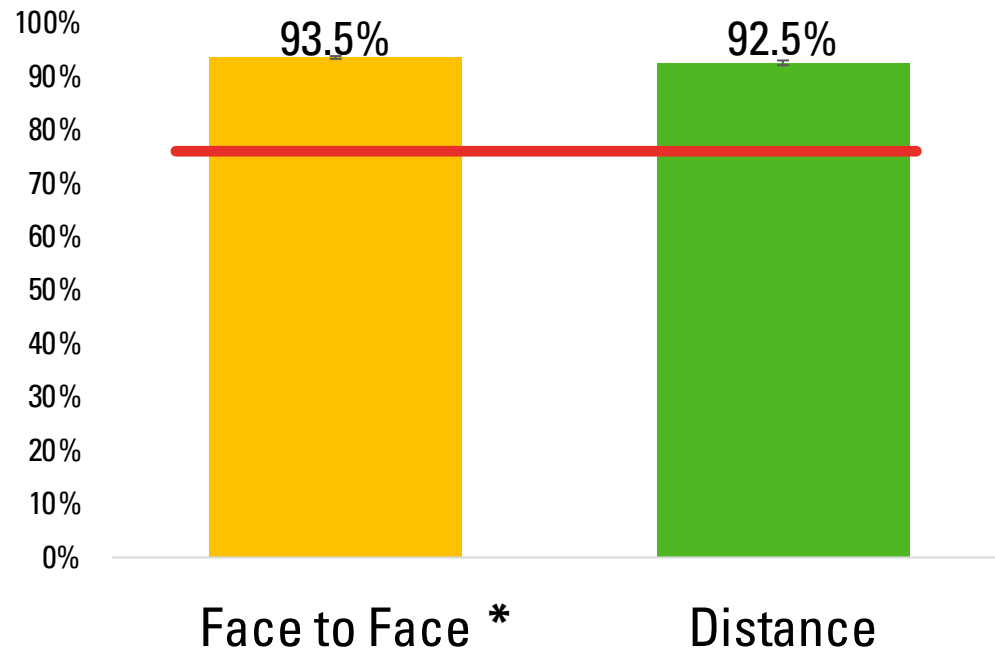
Face-to-face Significantly Higher for
Instructor Effectiveness OSHA 510 and OSHA 500



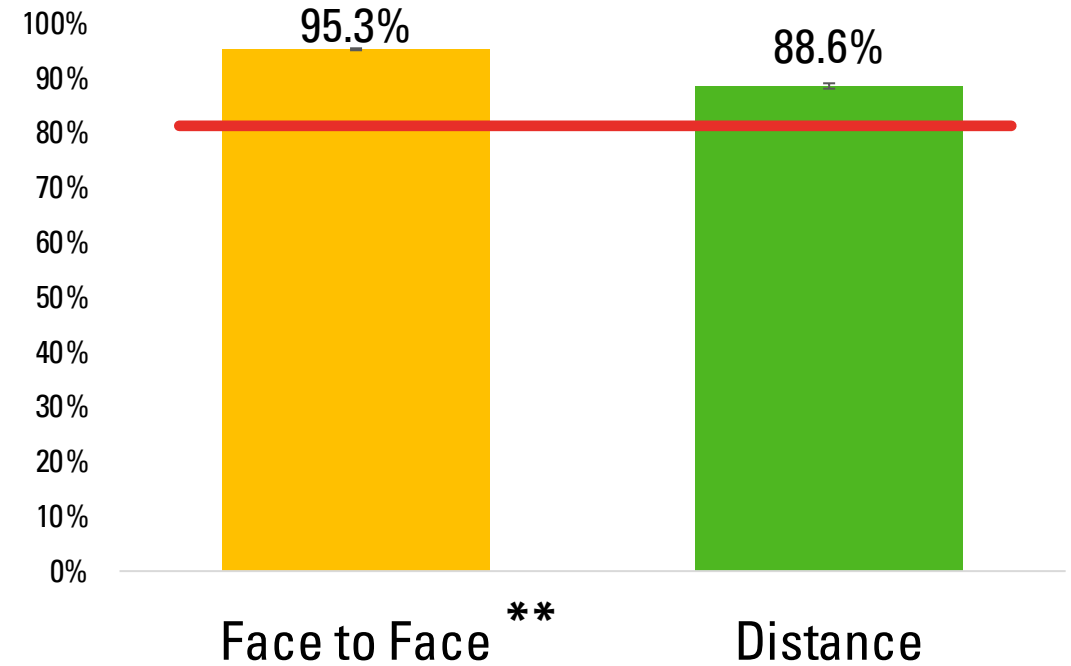
Test Scores

Face-to-Face Significantly Higher:
OSHA 510 and OSHA 500

OSHA 510



OSHA 500



Face-to-Face vs Distance

BOTH demonstrated high ratings of Effectiveness and Learning Gains

Face-to-Face received significantly higher ratings of Instructors' Effectiveness

Face-to-Face produced significantly greater **LEARNING**

ANALYSIS OF
DISTANCE
LEARNING

What are the differences in the design/delivery of the various providers?

Similarities among the design and delivery of training: multiple instructors, orientation training, Zoom, levels of interaction (breakout rooms), and testing



Differences among scheduling of training

Lunch/No lunch

Training length
before breaks

Length of
breaks

Consecutive
days versus
weekend break

Differences
in Design
and Delivery

Four Major Schedules Used



Consecutive Days

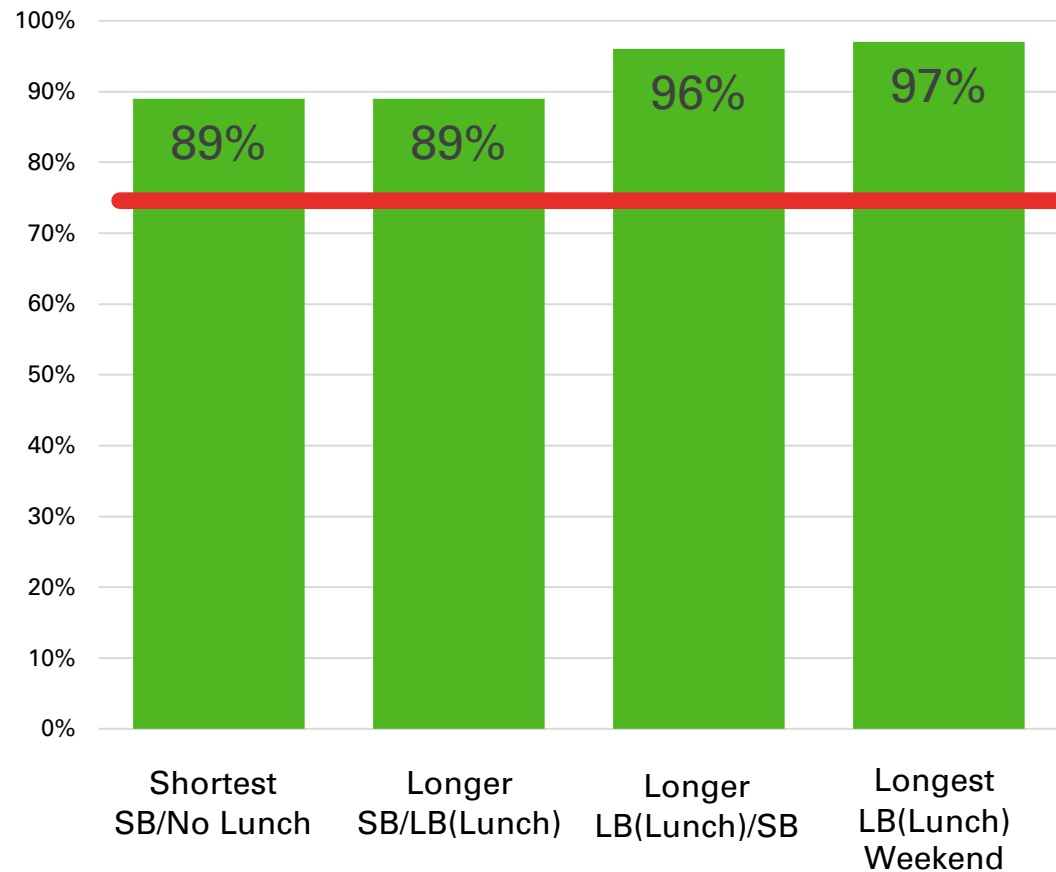
- Shorter training sessions (1 to 1.5 hours) with shorter breaks (10 to 15 minutes) distributed throughout the day
- Longer training sessions (2 hours) with short break (10 to 15 minutes) followed by longer break (30 to 45 minutes lunch)
- Longer training sessions (2 hours) with longer break (30 to 45 minutes lunch) followed by shorter breaks (10 to 15 minutes)

Weekend Break

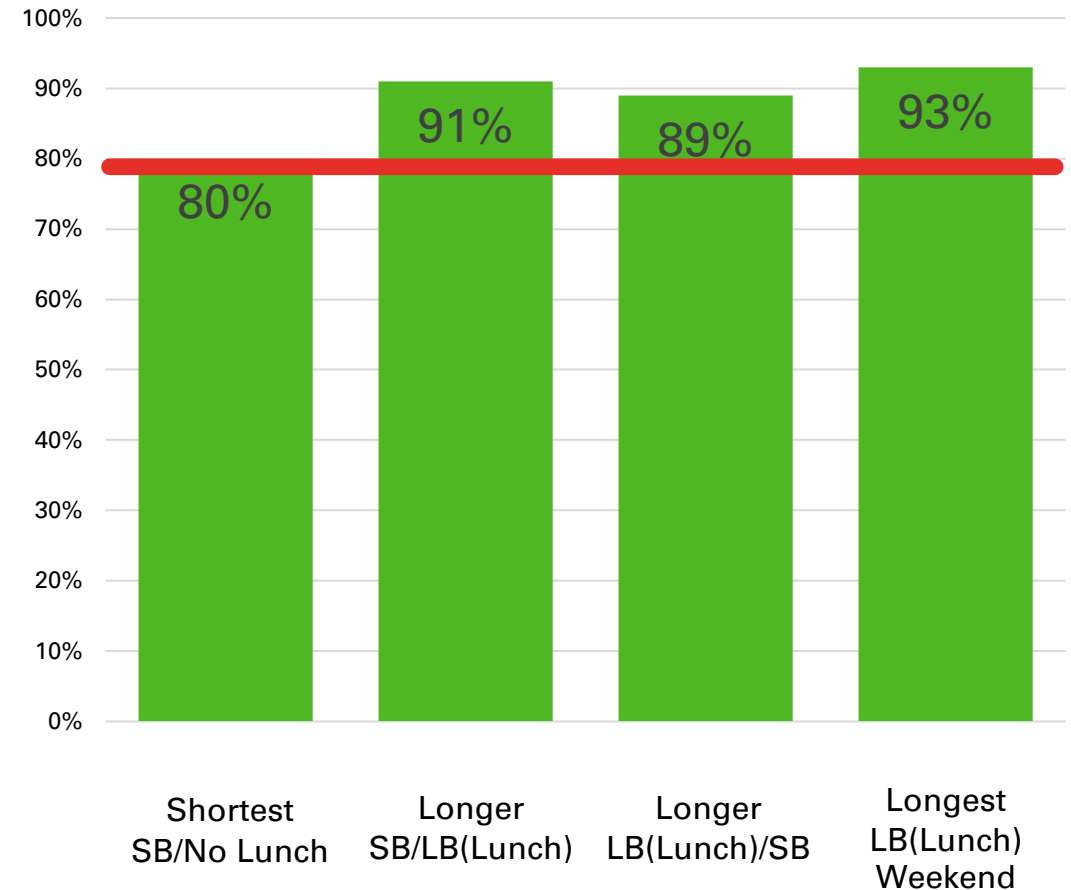
- Longest training sessions (2 to 2.5 hours) with one long break (45 minutes lunch) spread out over several days (weekend break)

Scheduling: Significant Effect On OSHA 510 And OSHA 500 Test Scores

OSHA 510**



OSHA 500**



IMPLICATIONS FOR SCHEDULING TRAINING

Scheduling did not generally impact ratings of effectiveness

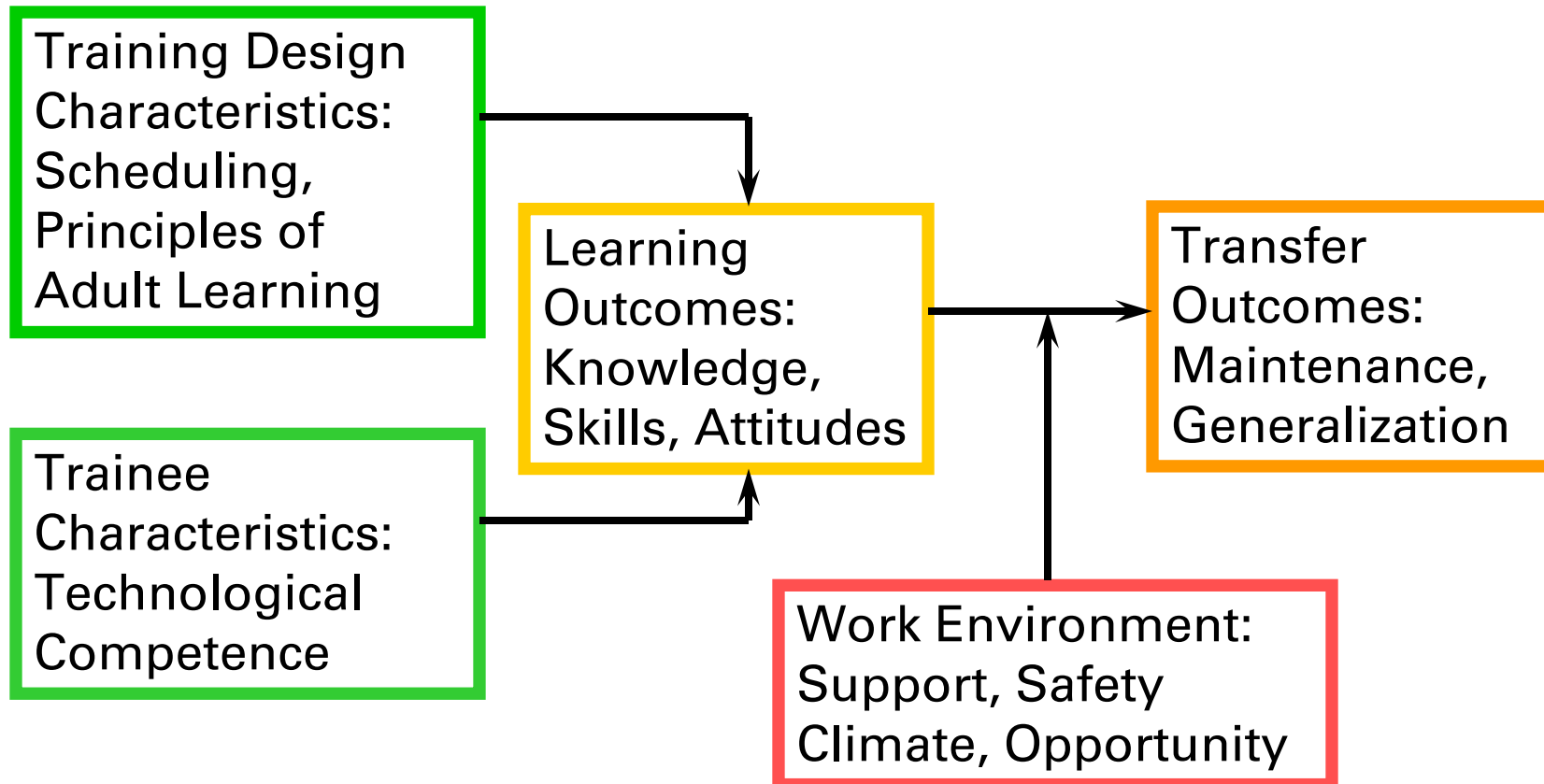
Longest training sessions with break that includes lunch presented over a longer period of time resulted in the **highest test scores**

Shorter training sessions presented with shorter breaks and no lunch resulted in the **lowest test scores**

**DISTANCE
LEARNING**

**Impact of Training
(3 to 6 Months Later)**

Transfer of Training



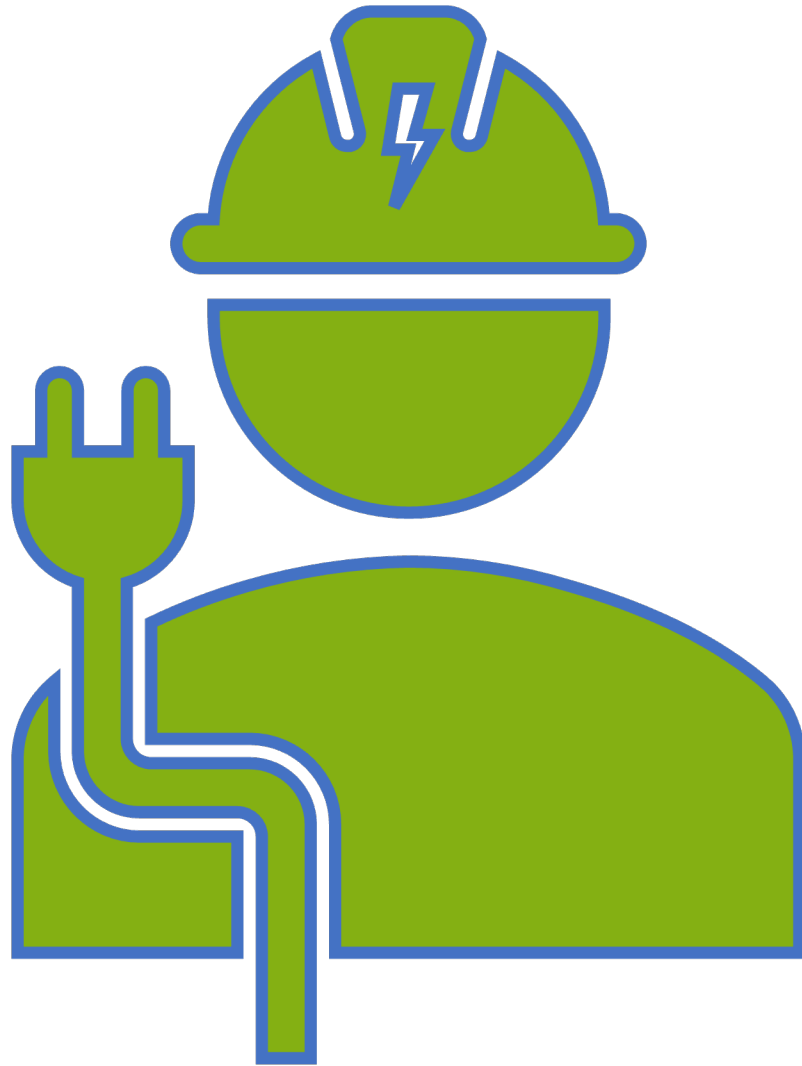
Adapted from Baldwin and Ford (1988)

Distance Learning Evaluation



- Completed by Trainers (n=16) and Trainees (n=100) on-line 3 to 6 months after training
- 46 items (quantitative and qualitative)
- Effectiveness
 - Instructor
 - Content
 - Format
 - Overall
- Learning/Performance
 - Safety-related Knowledge/Skills
 - Safety Performance
 - Support on-the-job


Did the Trainees' Work Experience Influence Training Outcomes?



Trade Affiliation

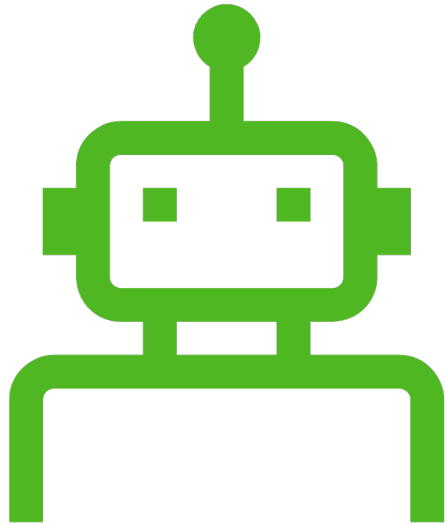
Ten Trades
Represented

NO Significant
Differences on
Effectiveness Ratings
and
Learning/Performance



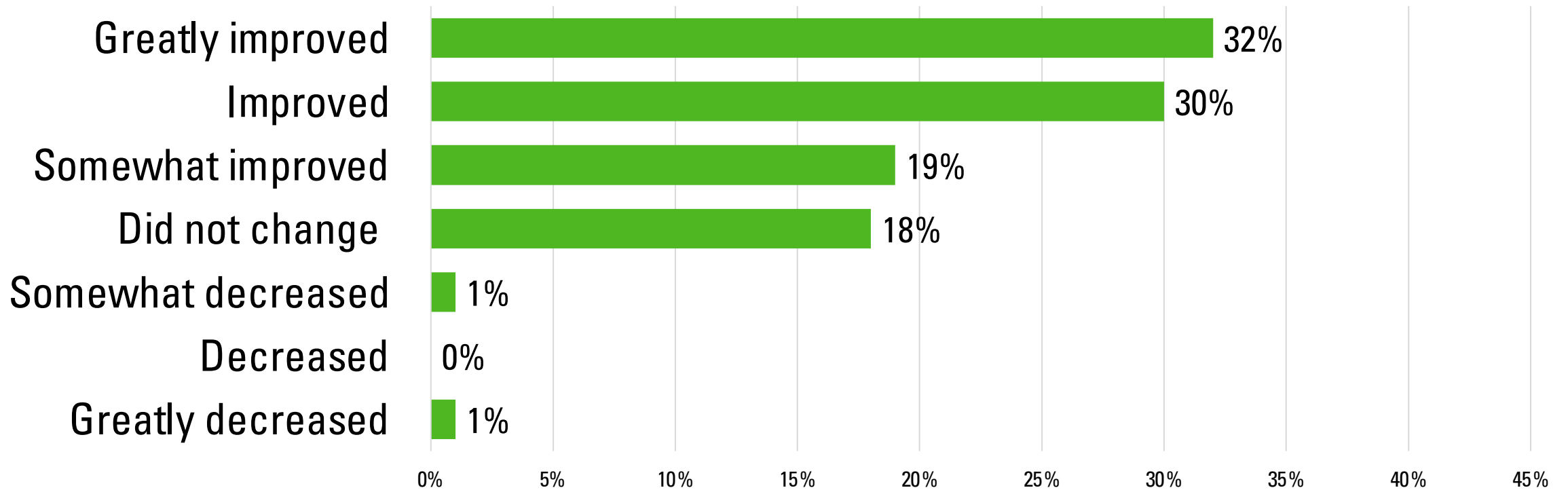
Did Trainees'
Technological Competence
Influence
Training Outcomes?

TRAINEES' TECHNOLOGICAL COMPETENCE

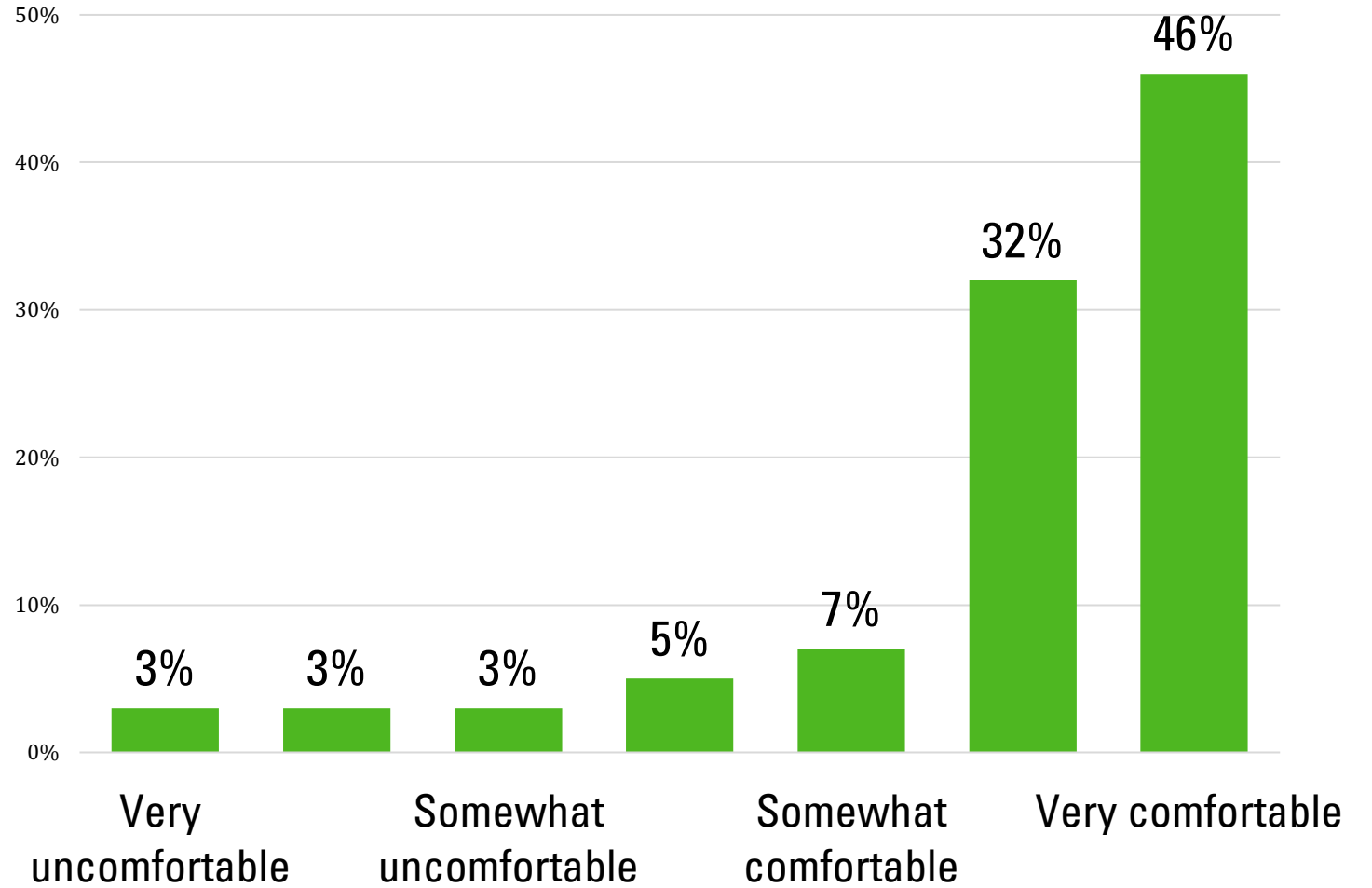


Comfort and Skill
with Technology

How much has trainees' Comfort with the Technology CHANGED during the pandemic?



Trainees Comfort With The Technology

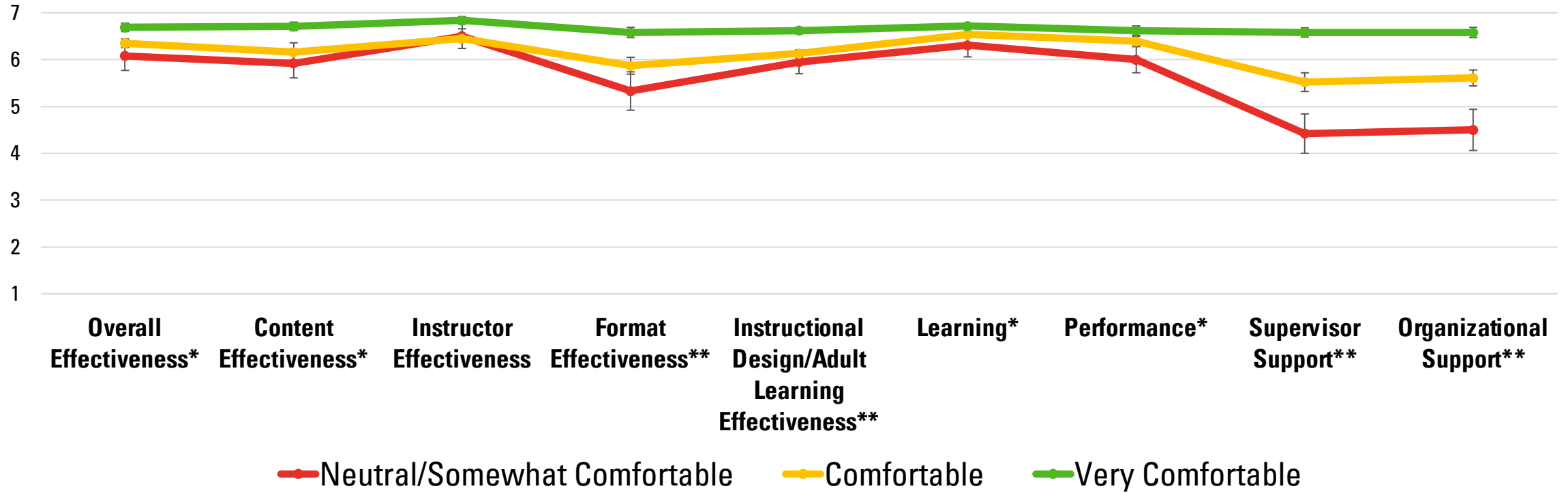




3 to 6 Months Later.....

How Did They Rate the
Training?

Influence of Trainees' Technological Comfort on Training Outcomes



Trainees' Technological Competence

Trainees' Comfort with and Skill in using the technology has improved during the pandemic

Trainees' Comfort with the Technology significantly influences their training outcomes

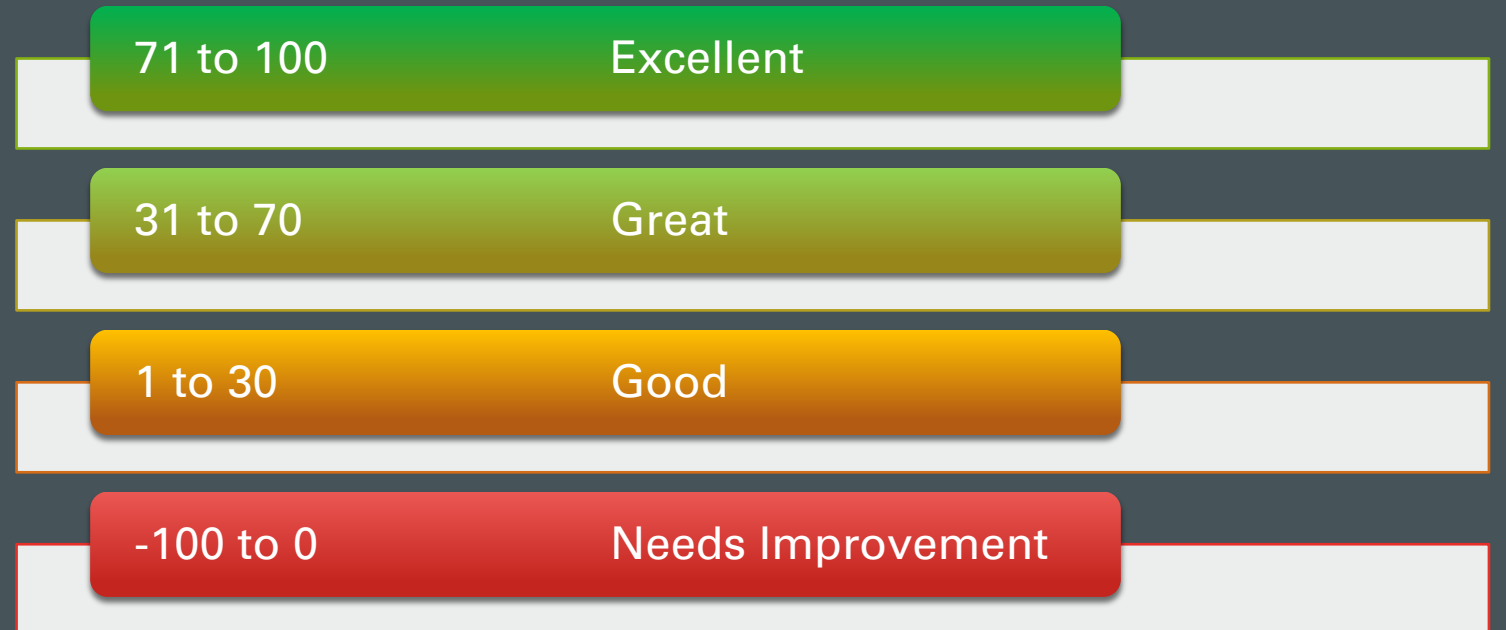
TRAINEES
AND
TRAINERS
PERSPECTIVE

Continued Use of Distance
Learning Moving Forward

Net Promoter Score (NPS)

- Likelihood to **RECOMMEND** the **OSHA 500** and **OSHA 510** courses delivered via **DISTANCE LEARNING** to others (0 to 10)
- **Promoters:** Ratings of 9 or 10
- **Passives:** Ratings of 7 or 8
- **Detractors:** Ratings of 0 to 6
- **NPS = % Promoters - % Detractors**
- NPS can range from -100 to 100
- Key measure of learner experience (overall experience)

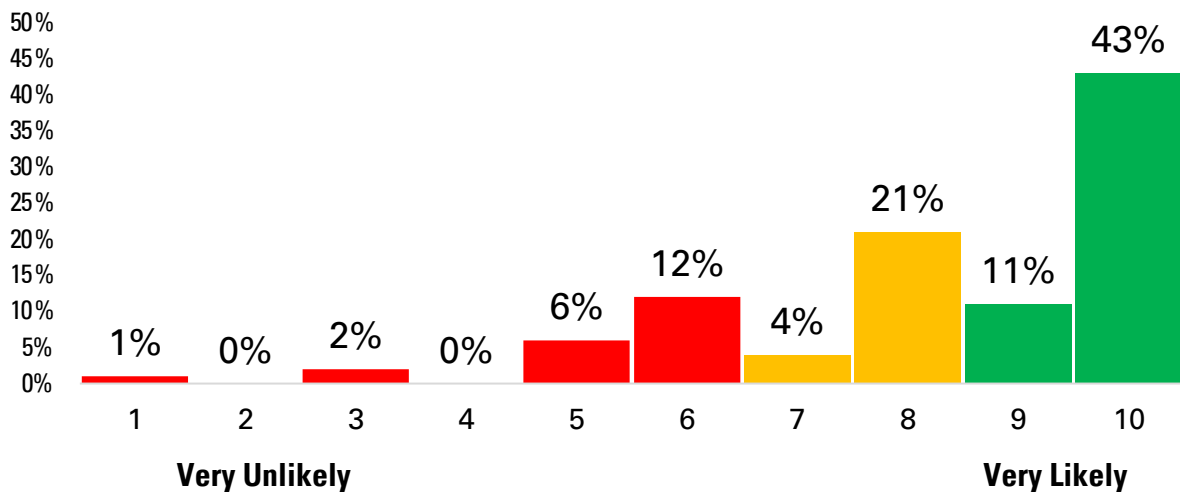
Net Promoter Score



Net Promoter Scores: Trainees

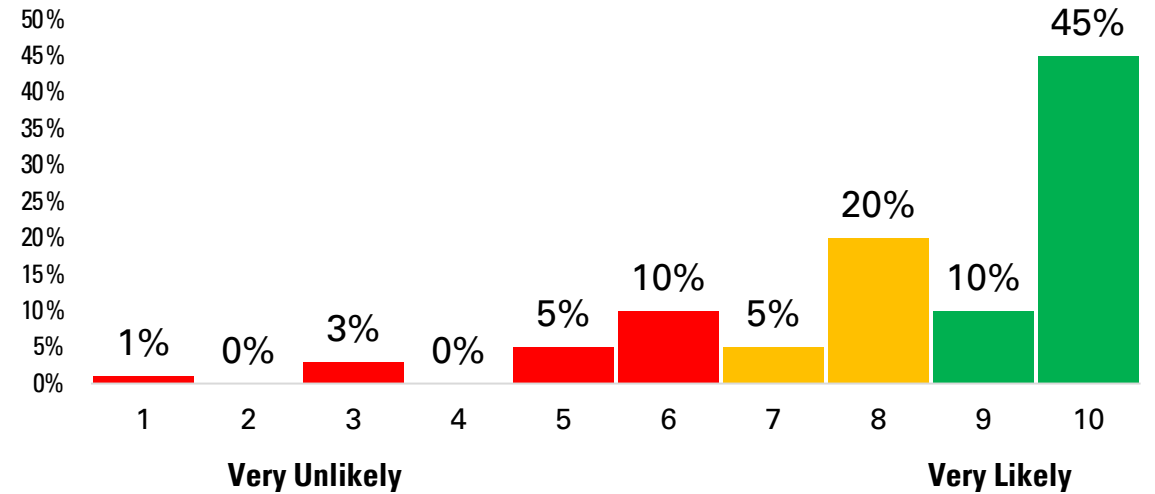
OSHA 510

Net Promoter Score = 33



OSHA 500

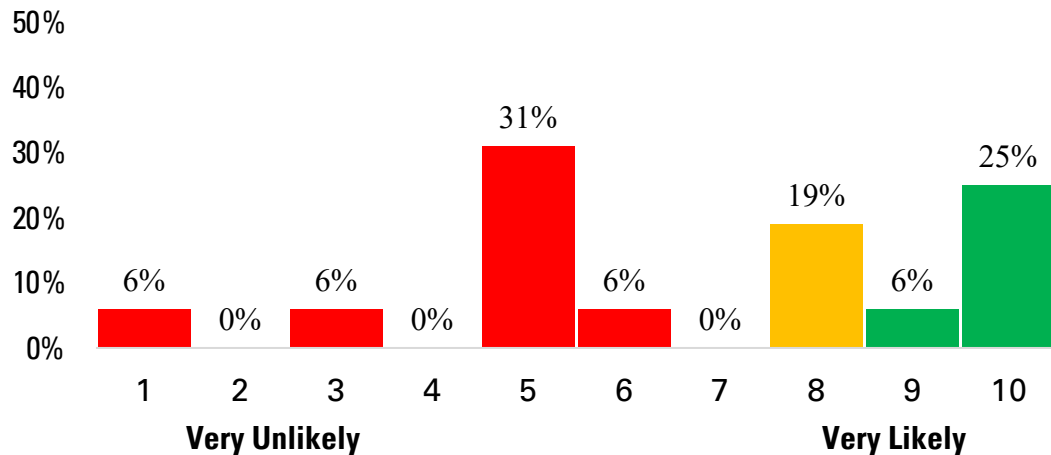
Net Promoter Score = 36



Net Promoter Scores: Trainers

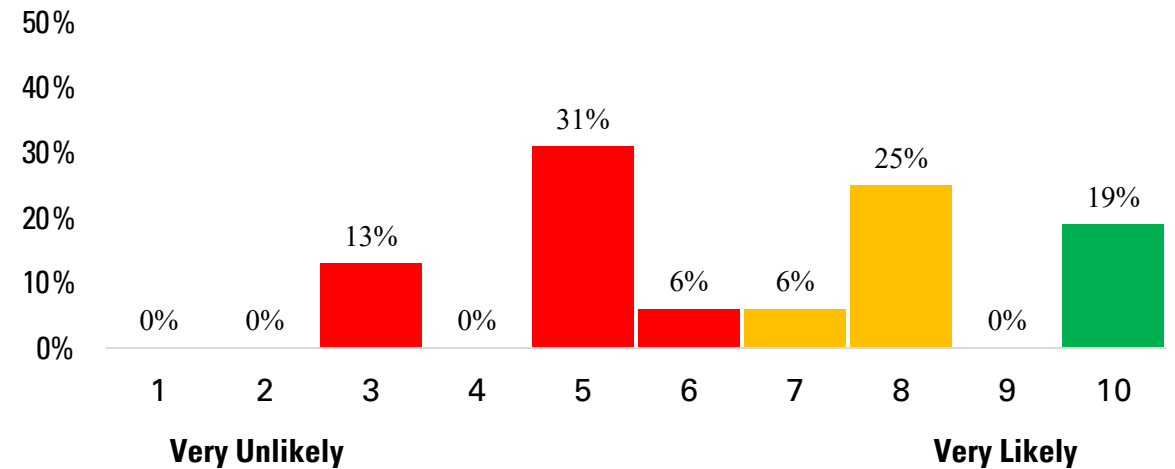
OSHA 510

Net Promoter Score = - 18



OSHA 500

Net Promoter Score = -31



Trainers: Distance Learning for Safety Training

Strengths

- Safety During COVID-19
- Convenience and Efficiency
- Breakout Rooms

Weaknesses

- Lack of Social Interaction
- Limits Assessment of Trainees' Comprehension
- In-person Preferred
- Technological/Technical Difficulties
- Limitations to Hands-on Activities
- Limits Student Support
- Student Engagement/Distractions



01

Social interaction
and social
support in virtual
training
environments

02

Trainee and
training
characteristics

03

Integration of
face-to-face with
distance (hybrid
formats; flipped
classrooms)

04

Net Promoter
Scores

05

Additional
Trainings: 40
Hour HAZWOPER

Future Considerations

Acknowledgements

Dr. Alicia Stachowski, Casie Sulzle, Amanda O'Connell, Univ. Wisconsin, Stout

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QUESTIONS



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