



Differing effects of in-person and online methods of delivering JHSC Certification Part 1 training

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- The Institute has an arm's-length relationship with the Ministry

Outline




- Background
- Research Questions
- Methods
- Results
- Discussion
- Concluding remarks
- Q & A

Why did we do the study?

- Use of online learning instead of face-to-face (F2F) for occupational health and safety (OHS) training was accelerated due to the pandemic
- Concerns about differences in training effectiveness remain
- IWH review of systematic reviews (Robson et al., 2022) showed:
 - **Knowledge achievement similar** for F2F and synchronous instructor-led distance learning in occupationally-related training
 - Based on studies health care professionals/students
 - **Research gaps:**
 - Other types of adult learners (e.g. education, manual/non-manual job)
 - OHS training

Robson L, Irvin E, Padkapayeva K, et al. (2022) A rapid review of systematic reviews on the effectiveness of synchronous online learning in an occupational context. Am J Ind Med 65(7):613-617.

Collaboration with Provincial HSAs

Health & Safety Associations	Main Sectors
 Infrastructure Health & Safety Association™	Construction, transportation, utilities
 Public Services Health & Safety Association™	Health & community care, education, municipal government
 Workplace Safety & Prevention Services®	Manufacturing, retail & other services, agriculture

JHSC Certification Part 1 training: 3 modalities

Instructor-led
in-person
face-to-face
(F2F)

3 days

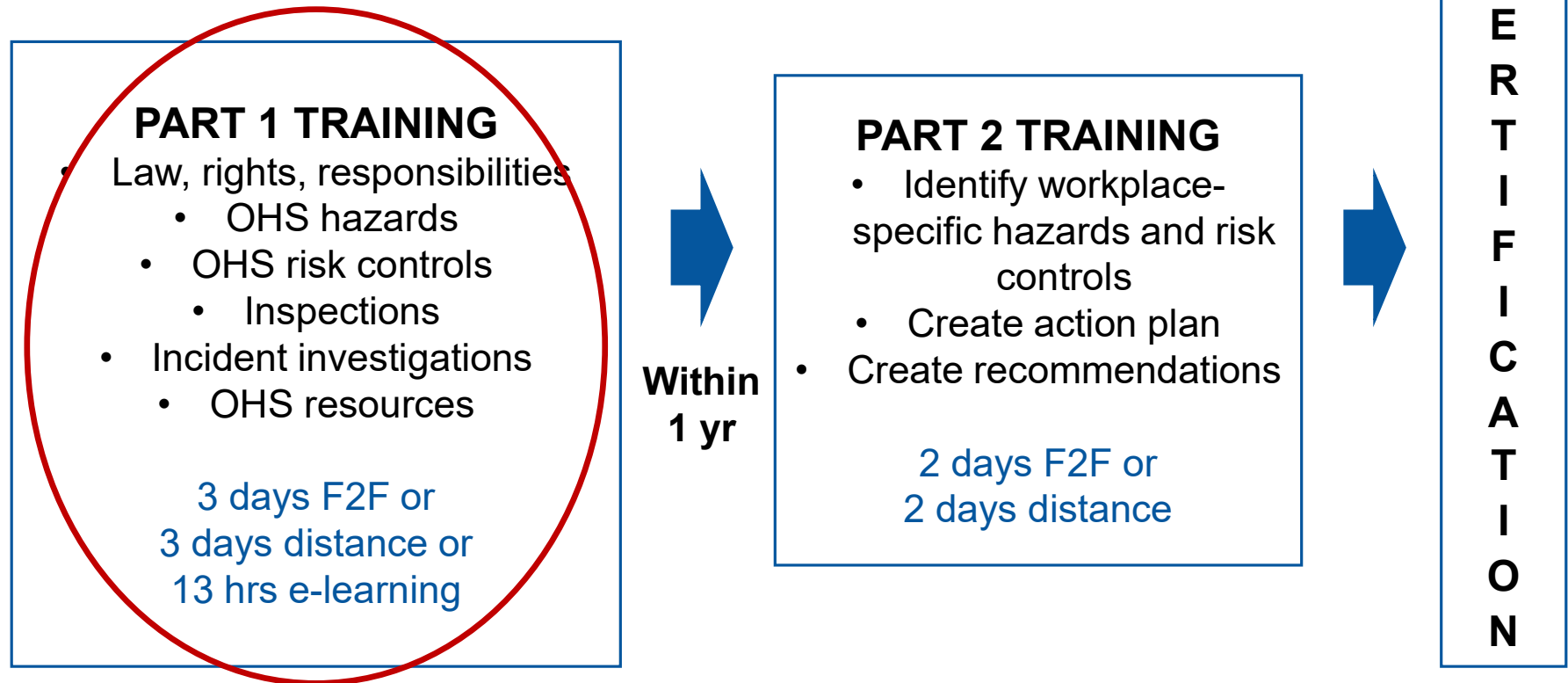
Instructor-led
synchronous
online
(distance)

3 days

Self-paced online
modules
(e-learning)

13 hours

JHSC member certification training in Ontario



<https://www.ontario.ca/page/program-standard-joint-health-and-safety-committee-training>

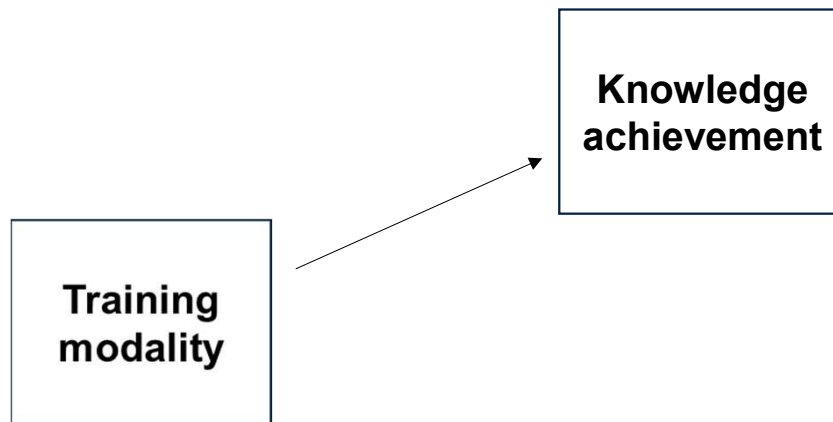
JHSC training program standard

- Standardized learning outcomes
 - Adult learning principles:
 - Relevance, variety, participatory, use own experience
 - Literacy appropriateness
 - Variety of activities
 - High degree of learner-instructor or learner-e-learning interaction
- Study observations verified the above:
- Breakout groups, workbook, exercises, polls, knowledge checks, videos, graphics, interactive slides, use of chat box, etc.

<https://www.ontario.ca/page/program-standard-joint-health-and-safety-committee-training>

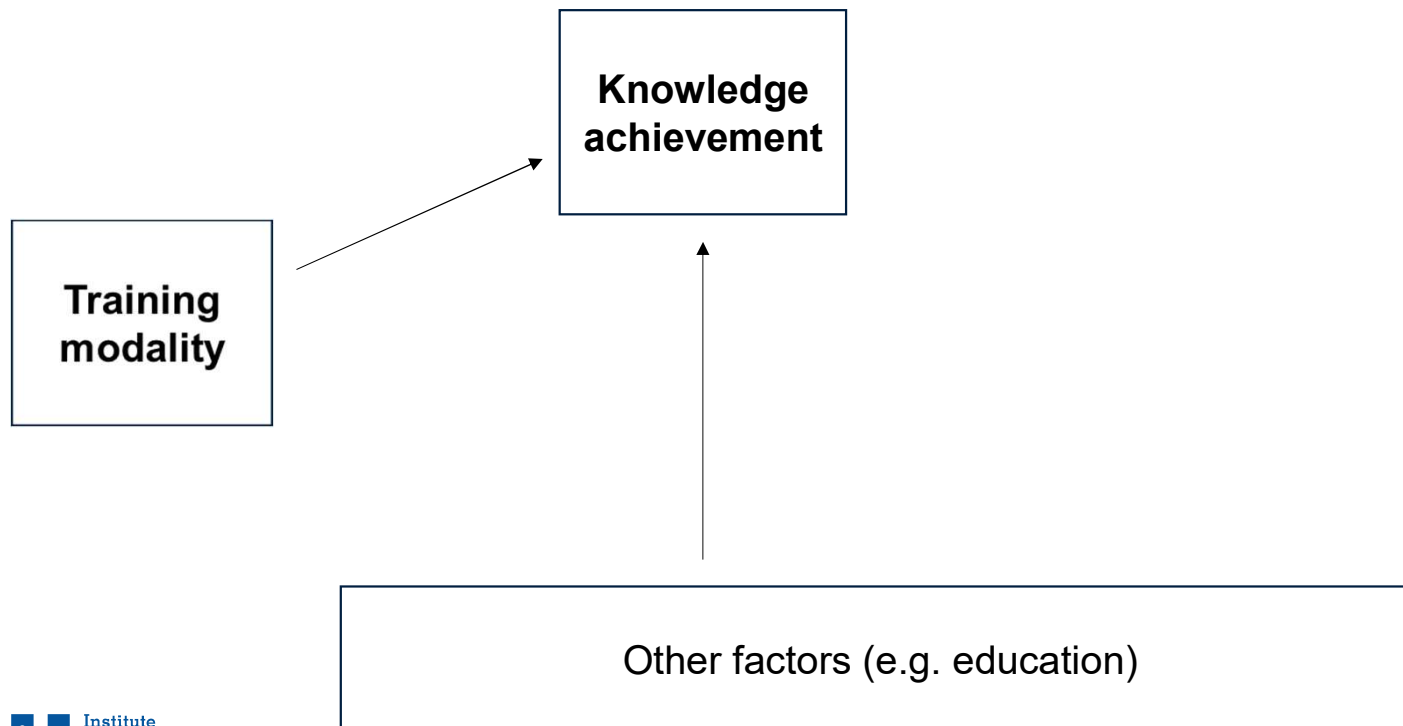
Research question 1 (primary)

- How do the following training modalities differ in post-training **knowledge achievement** among Ontario workers undergoing joint health and safety committee (JHSC) Certification Part 1 training?
 - Face-to-face (F2F)
 - Instructor-led distance (virtual instructor)
 - Self-paced e-learning



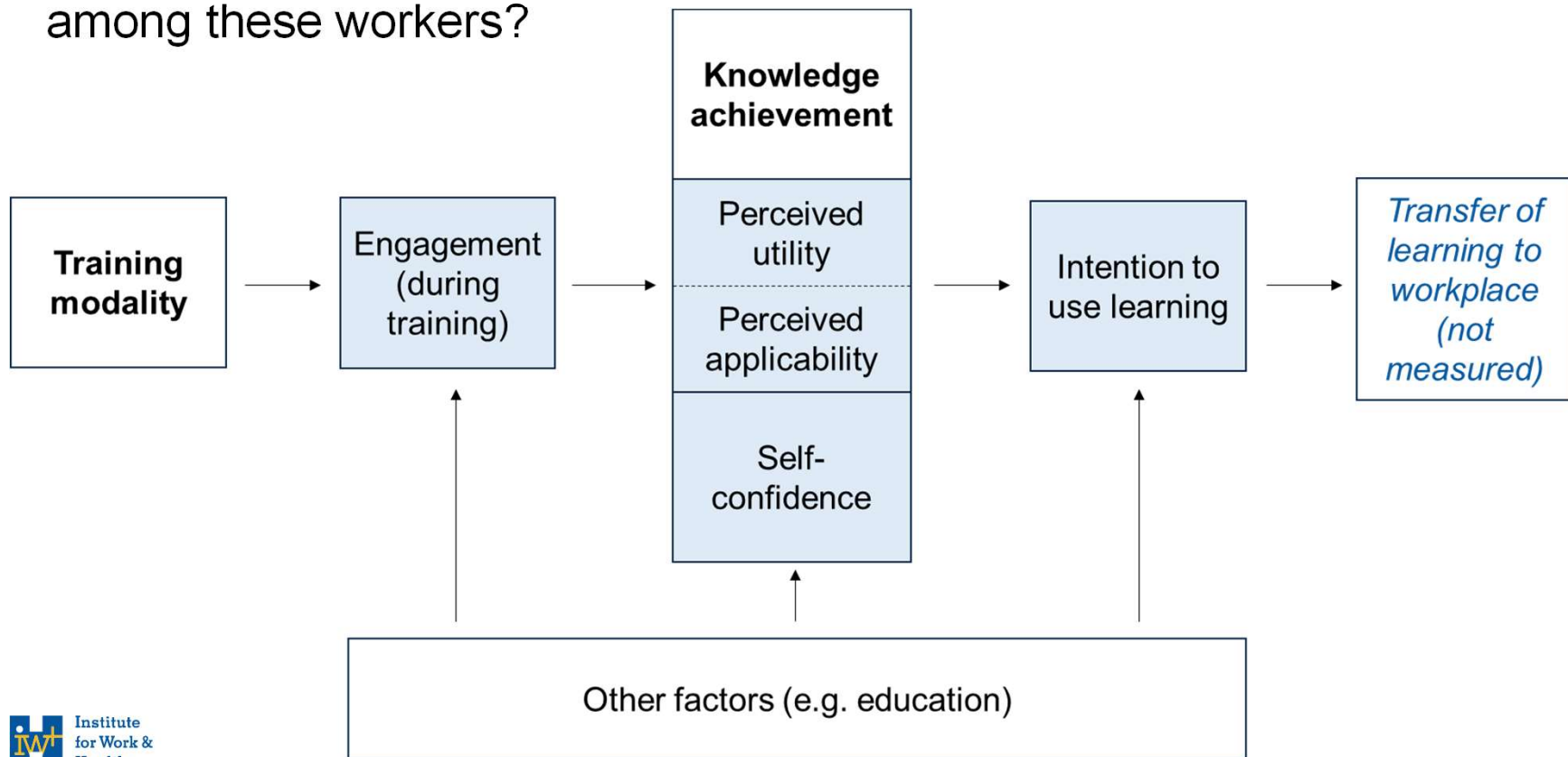
Research question 2 (secondary)

- Which ***other factors*** are associated with post-training knowledge achievement (after accounting for training modality)?



Research question 3 (secondary)

- How do the training modalities differ in ***other training outcomes*** among these workers?



Research question 4 (secondary)

- What suggestions do learners have for improving the content and delivery of the training?

What is a meaningful difference in knowledge score?

- Post-training JHSC-relevant knowledge test score, % correct (0% to 100%)
- 1%, 2%, 5%, **10%**, 20%?

Modality 2

Post-training average score =
55%, **65%**, 70%, 73%, 74%?

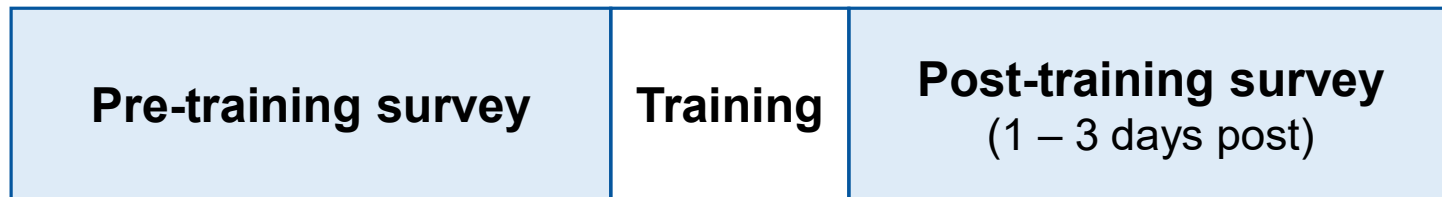
Modality 1

Post-training
average score =
75%

Modality 2

Post-training average score =
76%, 77%, 80%, **85%**, 95%?

Study design and measurement



Primary Outcome:

- **JHSC-relevant knowledge**

Secondary Outcomes:

- **JHSC-relevant knowledge**

- 1) Engagement 2) Perceived utility
- 3) Perceived applicability 4) Self-confidence
- 5) Intention-to-use learning

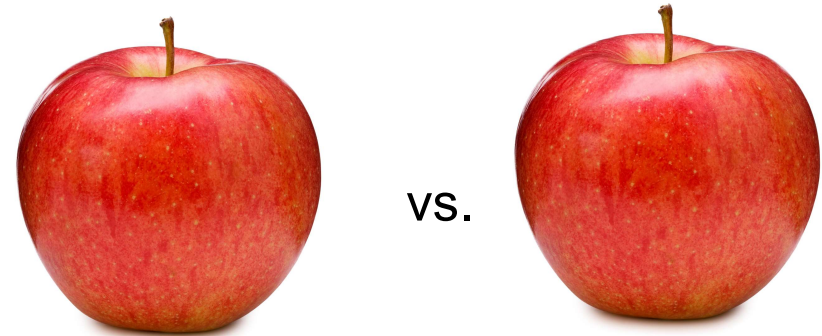
Other factors:

- Motivation to learn
- Modality preference

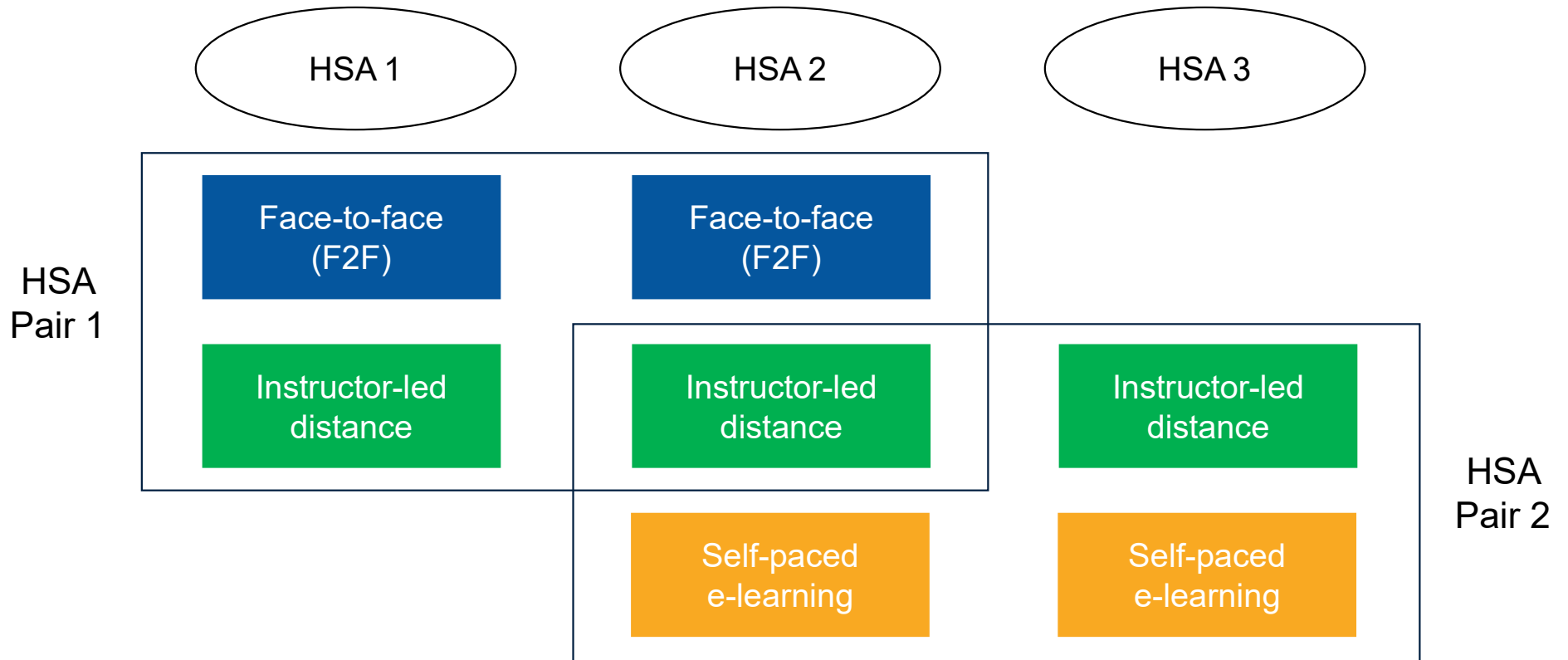
- Education
- Tenure on JHSC
- English as first language
- Age
- etc.

Analysis: Multiple linear regression modeling

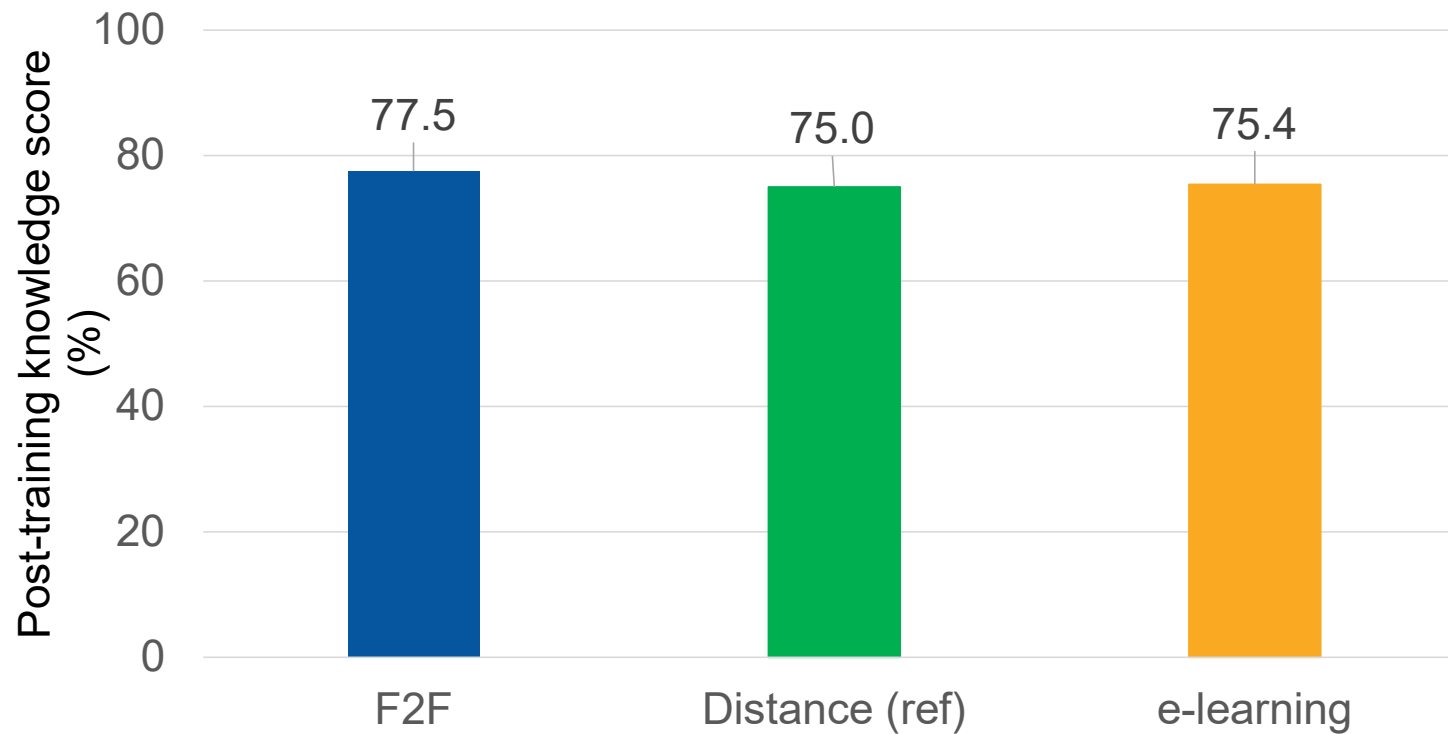
- Allows 'fair' comparisons between modalities
- **Statistical control** for:
 - HSA
 - Pre-training knowledge
 - Age
 - Gender
 - Education
 - English as 1st language
 - Non-manual/manual job
 - Number of employees
 - JHSC tenure



Analysis (cont.)

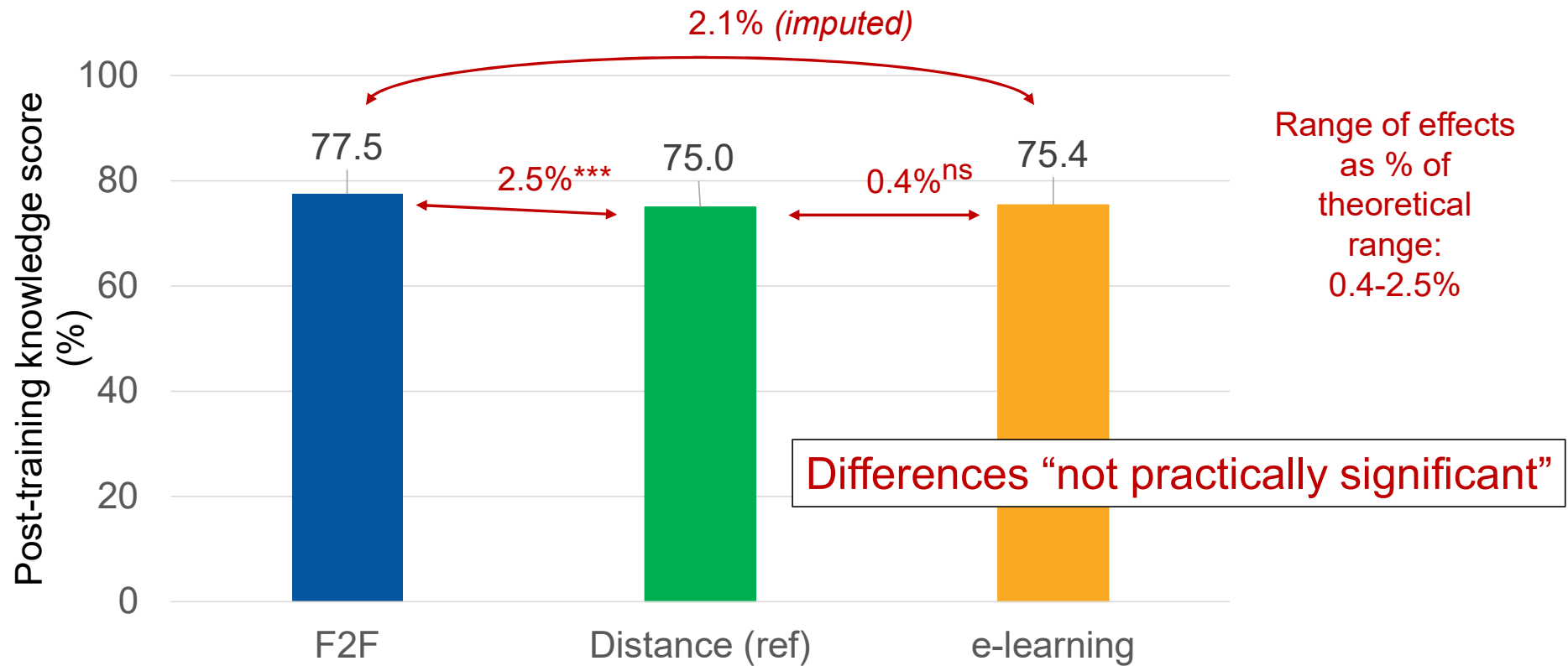


Effect of modality alone on post-training knowledge score (based on multiple regression analysis)



***, $p < 0.001$; ns, not significant

Effect of modality alone on post-training knowledge score (based on multiple regression analysis)



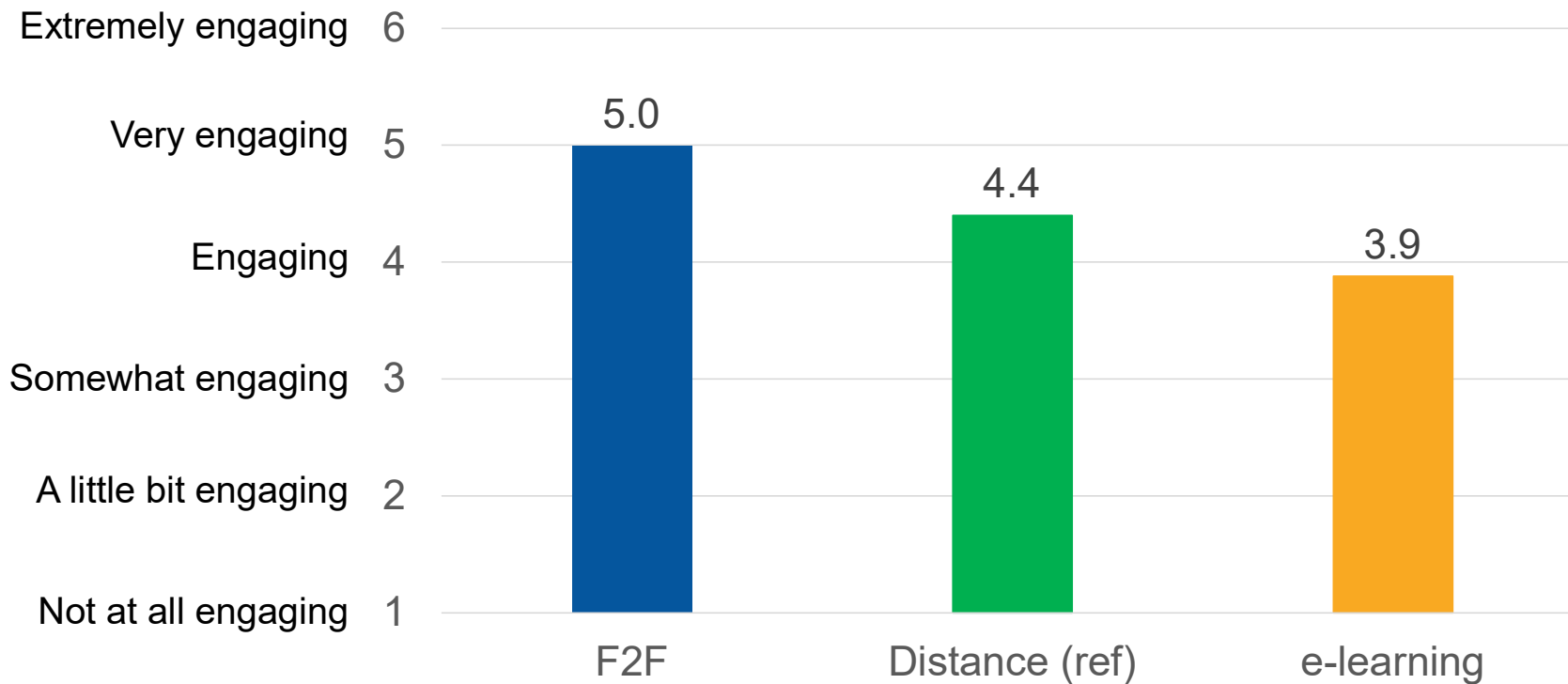
***, $p < 0.001$; ns, not significant

Other factors affecting post-training knowledge (based on multiple regression analysis)

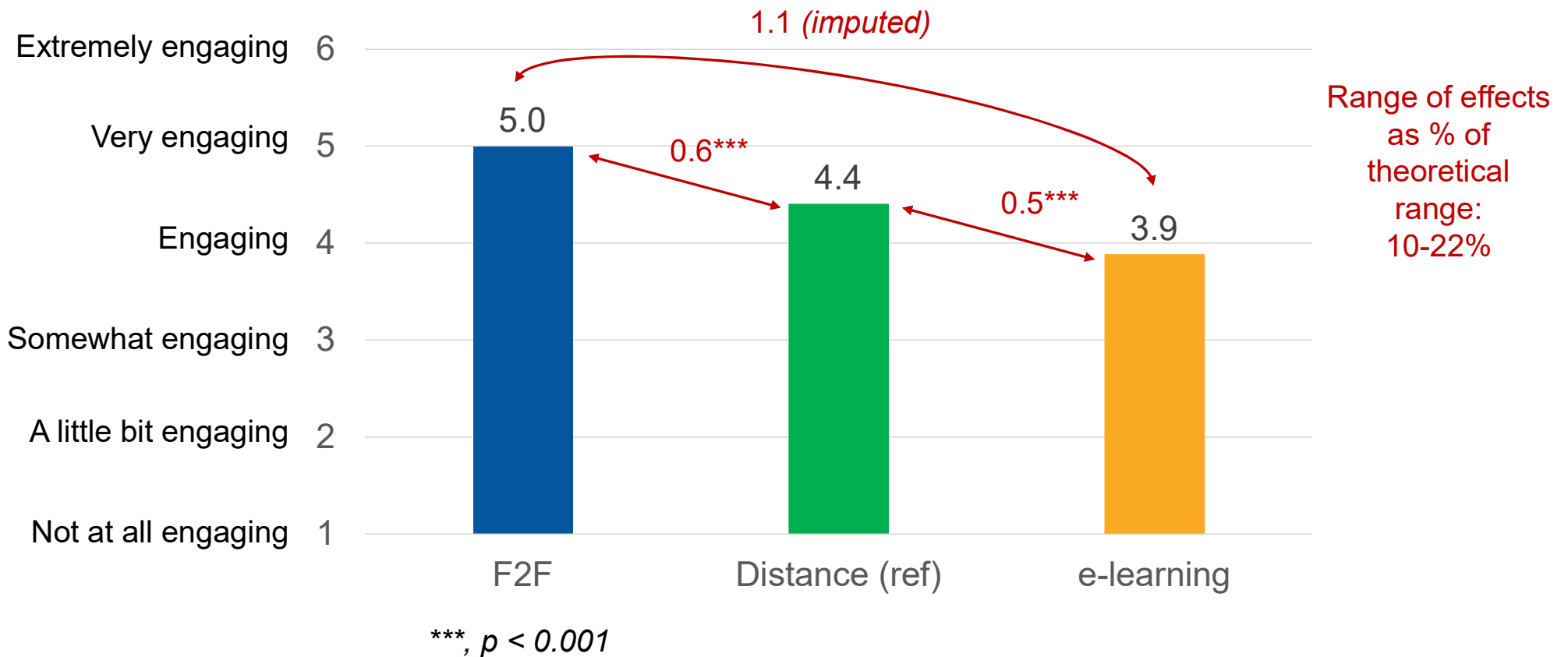
Other factors affecting post-training knowledge score	Size of effect on knowledge scores (range)
Education (university vs. trades/high school)	2 – 5%
Non-manual (vs. manual)	2 – 4%
JHSC tenure > 2 yrs (vs. < 6 mos)	1 – 4%
Pre-training knowledge (post-training increase per 1% increase pre-training)	0.03 – 0.2%
<20 employees (vs. 250+ employees)	- (3 – 4%)
HSA	1 – 4%

- *NOT statistically significant: age, gender, English as a 1st language*

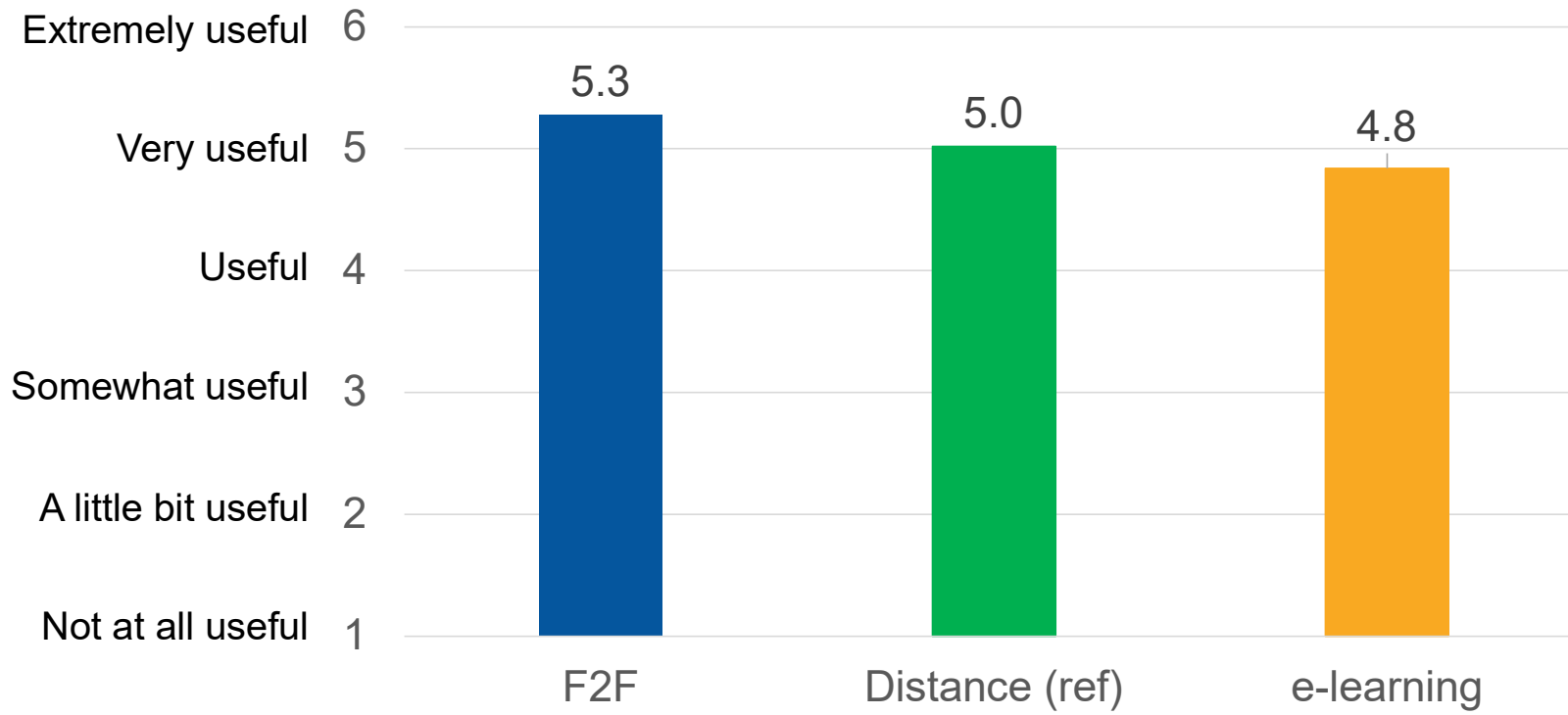
Effect of modality alone on engagement during training (based on multiple regression analysis)



Effect of modality alone on engagement during training (based on multiple regression analysis)

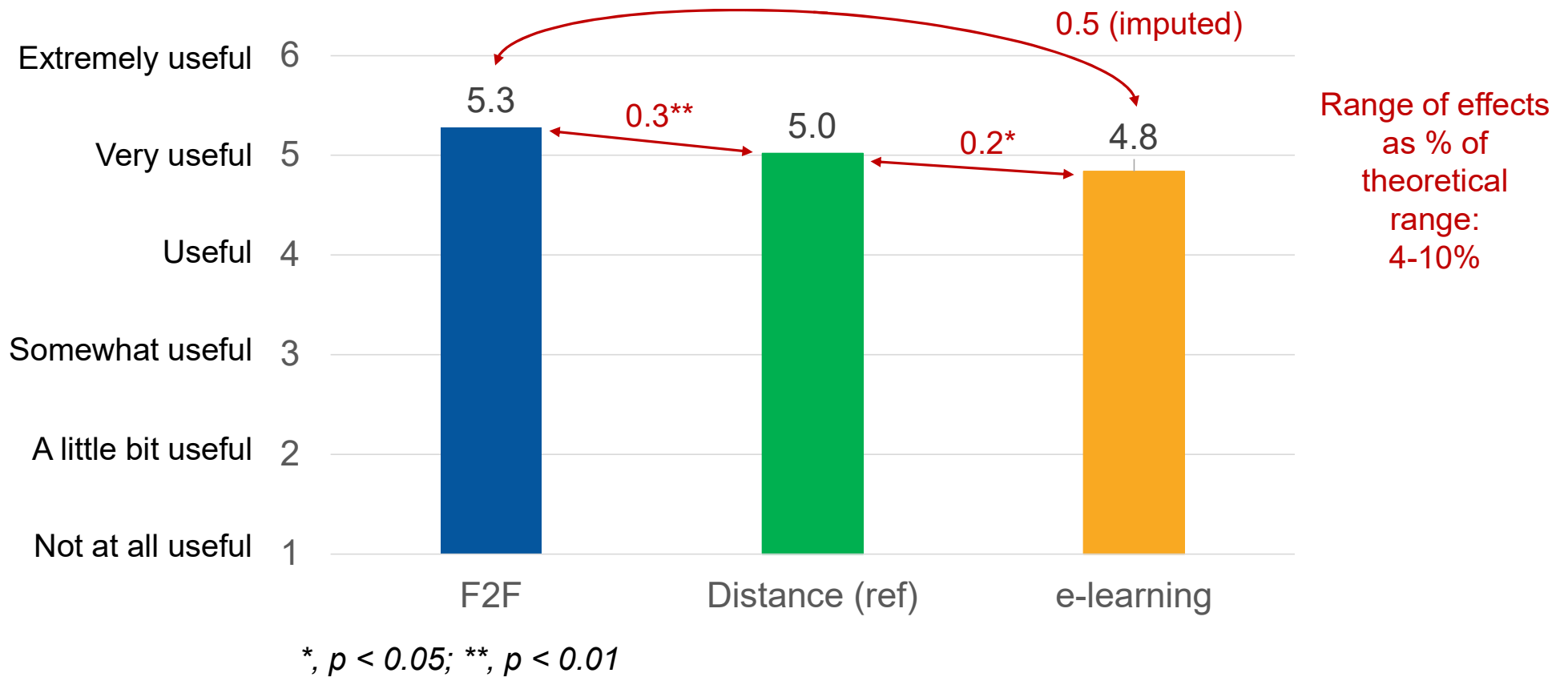


Effect of modality alone on perceived utility of training (based on multiple regression analysis)

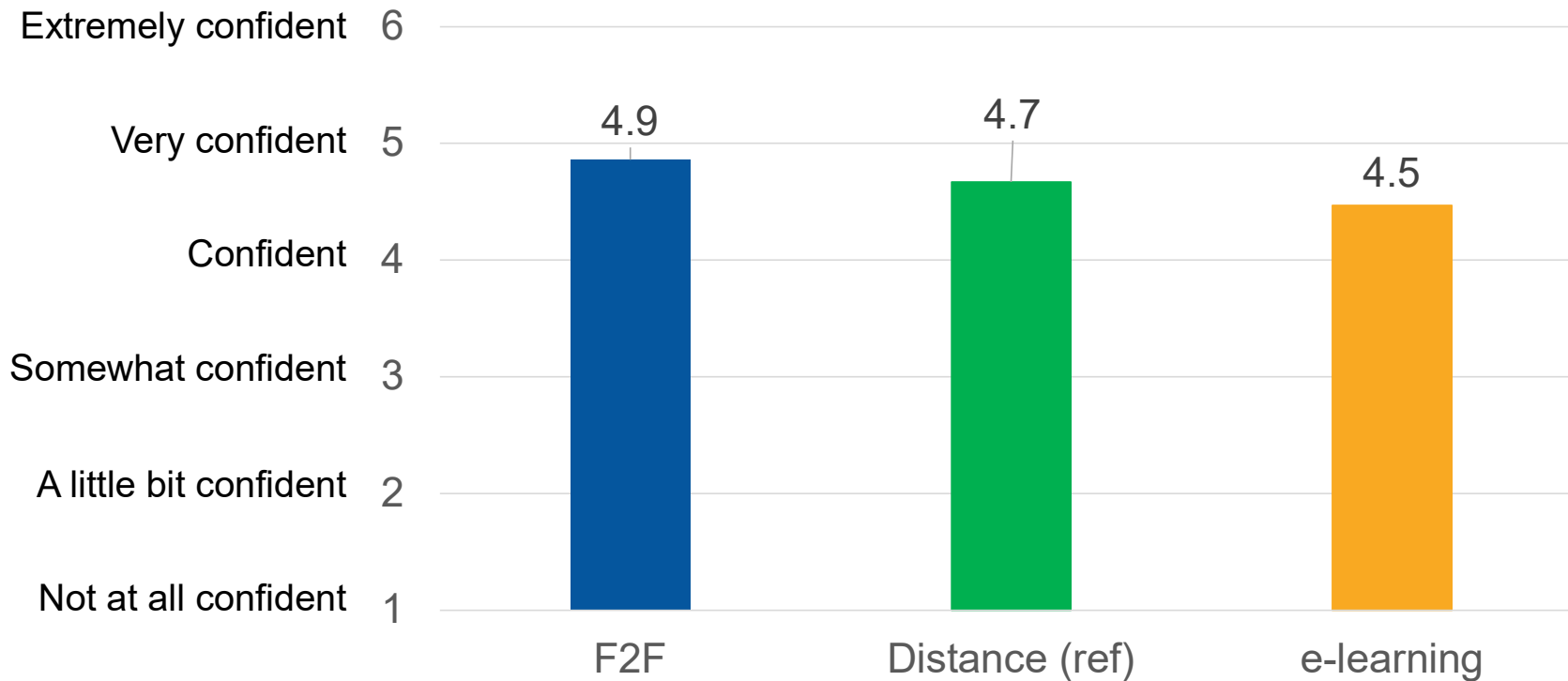


**, $p < 0.05$; **, $p < 0.01$*

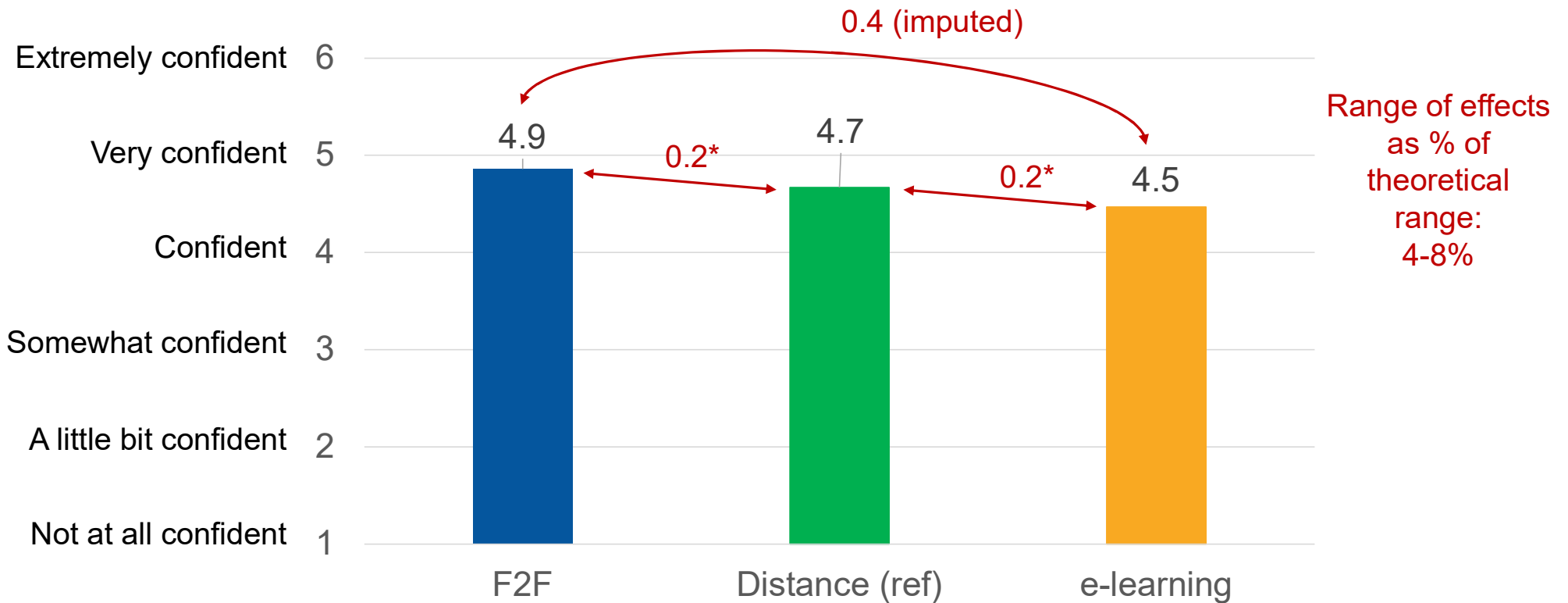
Effect of modality alone on perceived utility of training (based on multiple regression analysis)



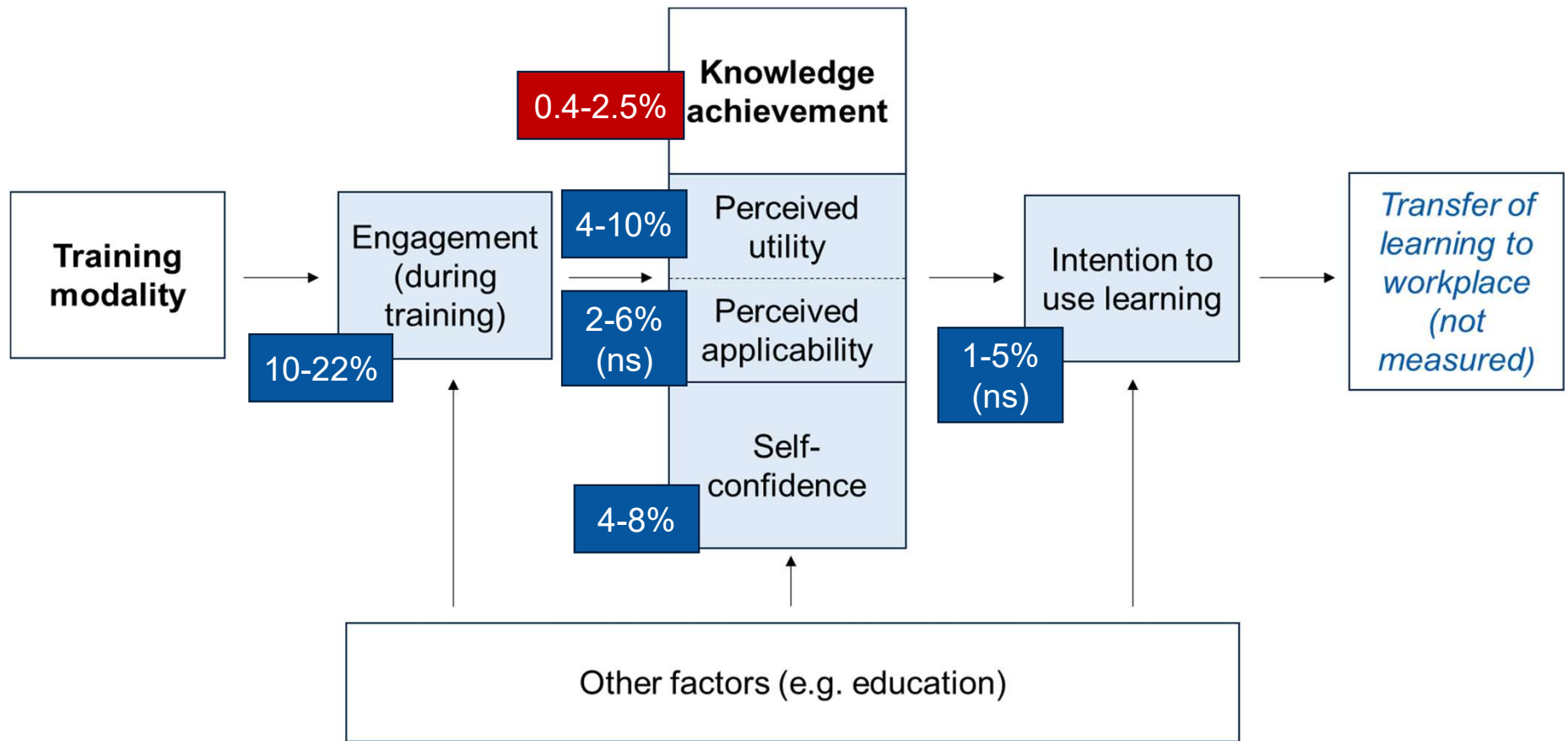
Effect of modality alone on post-training confidence to use learning (based on multiple regression analysis)



Effect of modality alone on post-training confidence to use learning (based on multiple regression analysis)



Overview of modality effects as % of theoretical ranges



Strengths

- Same course with same learning objectives, across modalities
- Diversity of learner characteristics
- Analysis accounted for differences in individuals, workplaces, HSA across modalities (“apples to apples” comparison)

Key limitations

- Intention-to-use measure may not have been sensitive to modality differences in the study context
- Scope of outcome measures
 - No longer term follow up (knowledge retention, transfer to the workplace)
 - No measure of skill
- Generalization limited to training designed primarily for acquiring fundamental knowledge

Concluding remarks

- Learners in F2F, distance and e-learning were similar in their **knowledge** following JHSC Certification Part 1 training
- Evidence indicates all modalities are appropriate for acquiring fundamental knowledge about JHSCs
- Modality differences in **engagement, perceived utility, and self-confidence** for learners post-training were seen:
 - F2F > distance > e-learning
- More research is needed to understand whether all modalities would be appropriate for training aimed primarily at developing OHS skills for application in a workplace context (e.g., Certification Part 2 training)

Publications about research

- Final report will be posted on IWH site in one week
 - Link will be in email from Zoom (from IWH) along with link to recording of this presentation
- Stay tuned for journal manuscript

Thank you

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