

Central Whidbey Island Fire & Rescue

CWIFR

Serving Coupeville, Greenbank,
& Central Whidbey Island



Live Fire Training as Simulation The Role of Fidelity

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Central Whidbey Island Fire & Rescue





CFBT-US, LLC

Providing training in fire behavior and firefighting strategies and tactics from an international perspective...



- United States
- Canada
- Sweden
- England
- Germany
- Croatia
- Malaysia
- Australia
- Peru
- Chile
- Poland

Interesting Experiences

- ◆ Diverse work experience & education
- ◆ IFIW Founding Member
- ◆ IFSTA Validation Committees
- ◆ UL Research Technical Panels
- ◆ UL FSRI Advisory Board Member
- ◆ Student of the craft

A Starting Point

For the things we have to learn before
we can do, we learn by doing.

Aristotle

Nicomachaen Ethics



Understanding and Application



Knowledge
& Skill



Is there a disconnect between the training and operational contexts?

What's the Difference



- ◆ Fuel Characteristics
- ◆ Fuel Load
- ◆ Ventilation Profile
- ◆ Heat Release Rate
- ◆ Thermal Environment

What's the Difference

Improperly designed training may provide the learner with an inaccurate perspective on the fire environment which can lead to disastrous consequences.

Not all that is learned is taught!

The Building

Purpose built training structures differ from those more typical of the built environment.



Gypsum Board



Ceramic Tile



Steel

Thermal Conductivity, Specific Heat,
Compartmentation, & Ventilation Profile?

The Fuel

NFPA 1403 Specifications and Limitations



Fidelity



The extent to which a simulation reflects reality

- ◆ Physical Fidelity
(Looks Realistic)
- ◆ Functional Fidelity
(Acts Realistically)

A Simple Model

		Physical Fidelity		
		Low	Medium	High
Functional Fidelity	High			●
	Medium		●	
	Low			



Back to Basics



- ◆ Simulations are intended to model reality
- ◆ On the surface it high fidelity makes sense.
- ◆ All models are wrong, but some are useful!

*A more important question is:
What aspects of fidelity are important?*

Important Questions

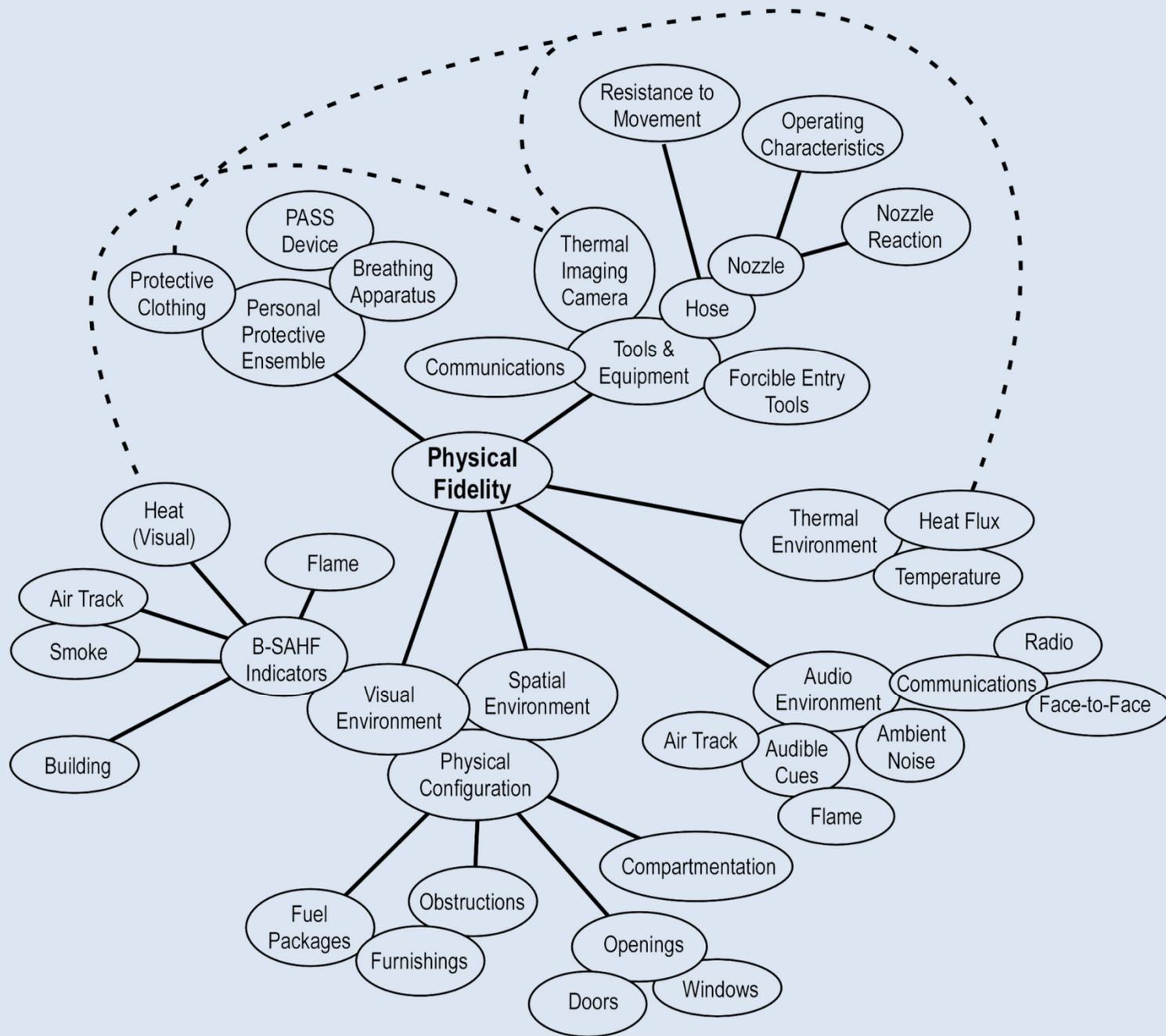
- ◆ What degree of simulation fidelity is necessary?
- ◆ What are the key elements of fidelity for various learning outcomes?
- ◆ Is live fire training the only way to achieve these outcomes?

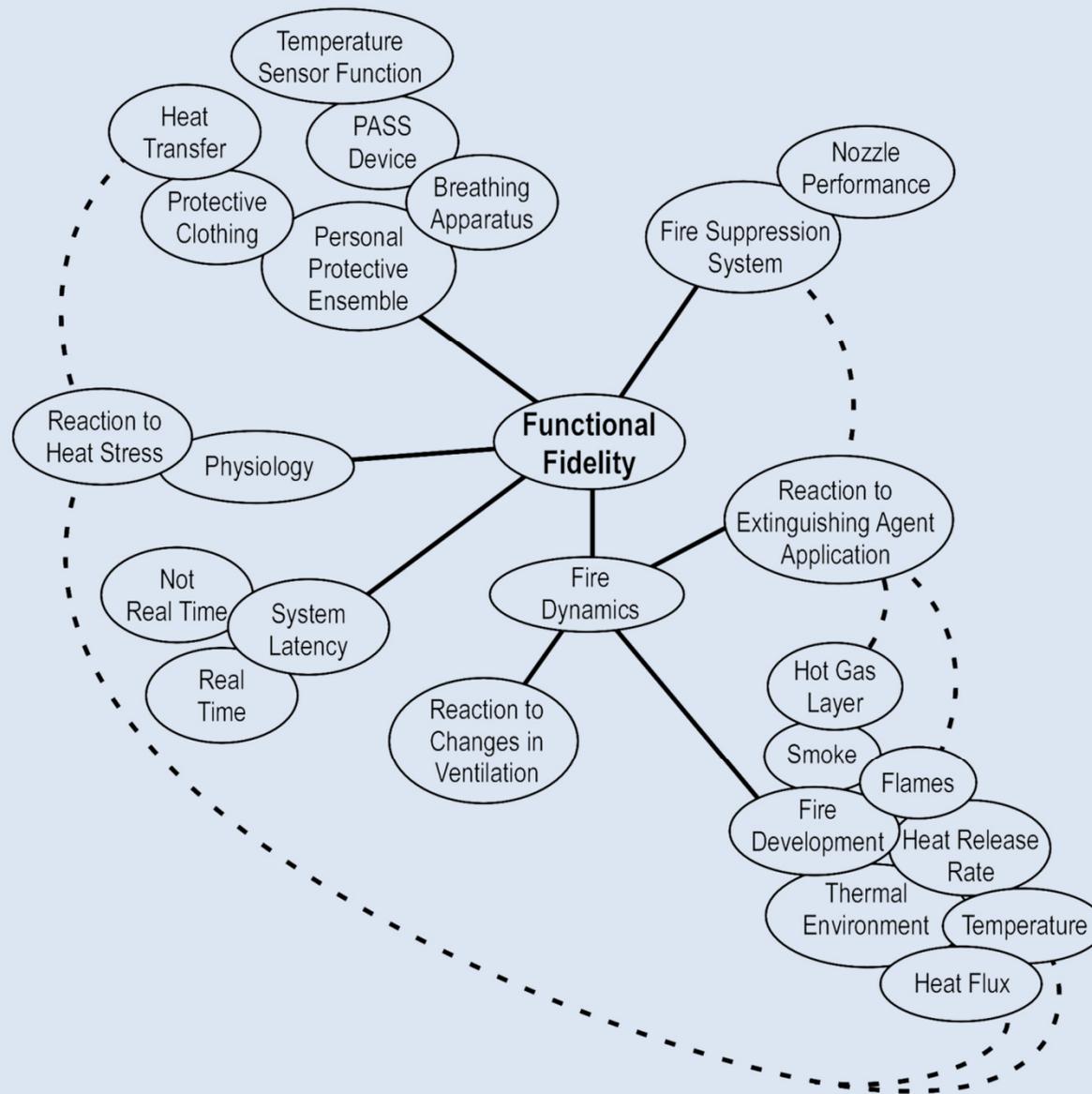
Important Questions

Training effective task performance in stressful situations requires that the following conditions be met:

- ◆ *Exposure and conditioning to stressors*
- ◆ *Prevent built-up anxiety*
- ◆ *Minimize interference with skill acquisition*







Maintaining Balance



Fidelity must match the purpose of training activity!

Intended Purpose



- ◆ Fire development
- ◆ Nozzle technique
- ◆ Door entry
- ◆ Risk assessment
- ◆ Integrated tactics

Questions Remain

- ◆ What are the most effective methods of developing firefighters' understanding of compartment fire behavior?
- ◆ What is necessary to effectively facilitate transfer of this knowledge from training to the operational context?

Questions Remain

- ◆ What level of fidelity is necessary in live fire training to develop and maintain critical skills?
- ◆ How can technological simulation (computer or video based) be used to augment live fire training to maintain proficiency?

Questions Remain

To what extent might non-live fire simulation (e.g., two dimensional or immersive virtual reality computer based simulation) be used to develop compartment firefighting competencies?

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