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Simulators in MET - How should we use them in effective teaching and learning?

Professor Mike Barnett

Warsash Maritime Academy

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Introduction

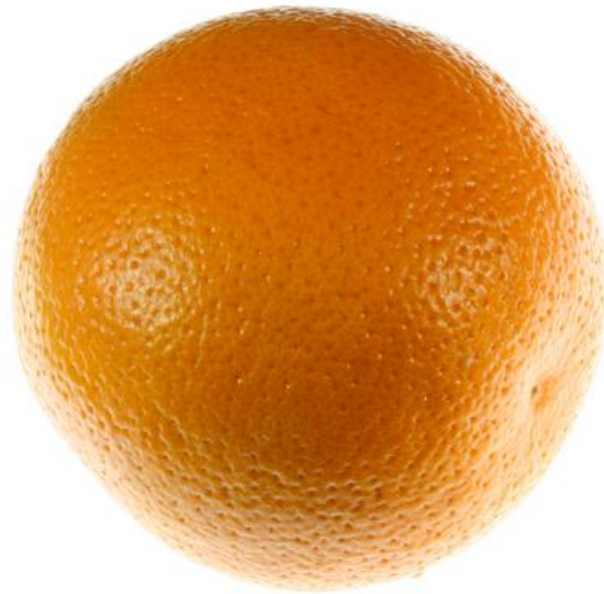
- The types and properties of simulators;
- The relevance of simulator realism (*fidelity*);
- How the effectiveness of simulator training is measured (*transfer*);
- Some of the pedagogical issues involved in using simulators.



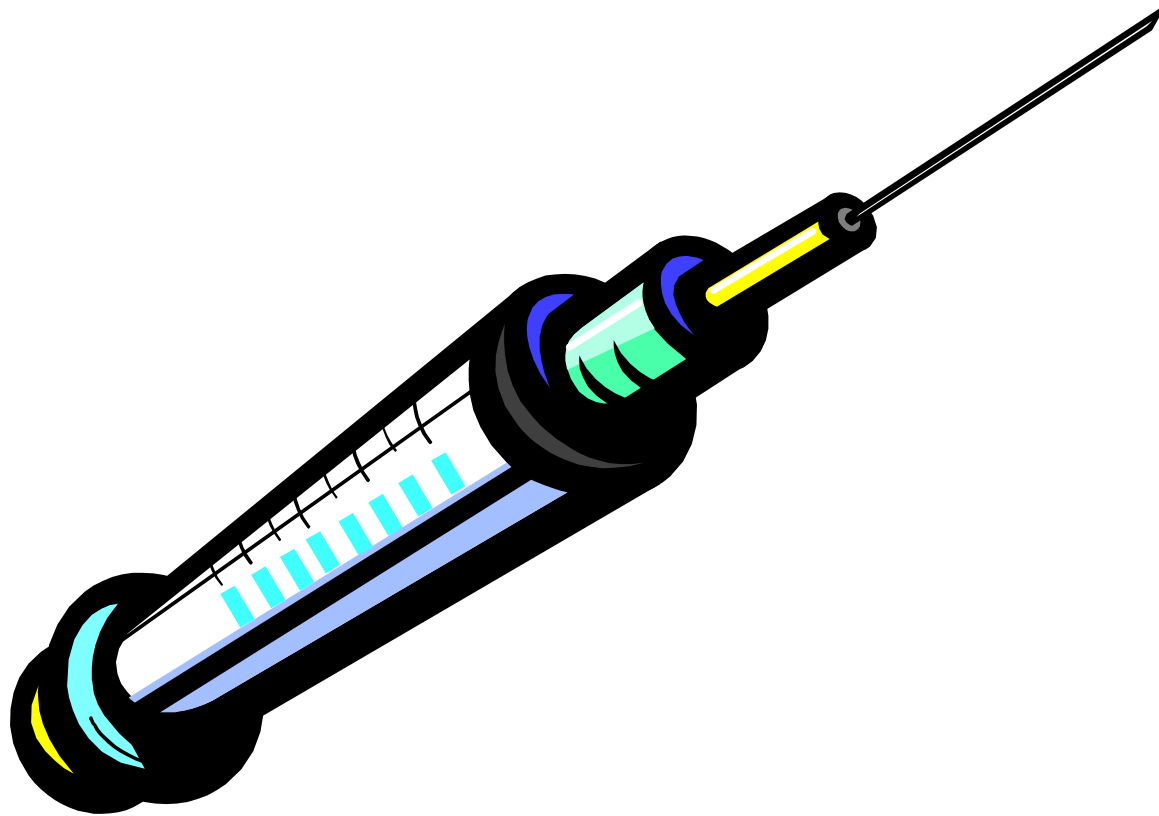
Types of simulation

- Role play
- Desk top exercises
- Radar/ARPA/VTS
- Fire-fighting module
- Full mission ship's bridge
- Engine control room
- Liquid cargo operations
- Scale manned models

Why is an orange like a simulator?



Does this give you a clue?



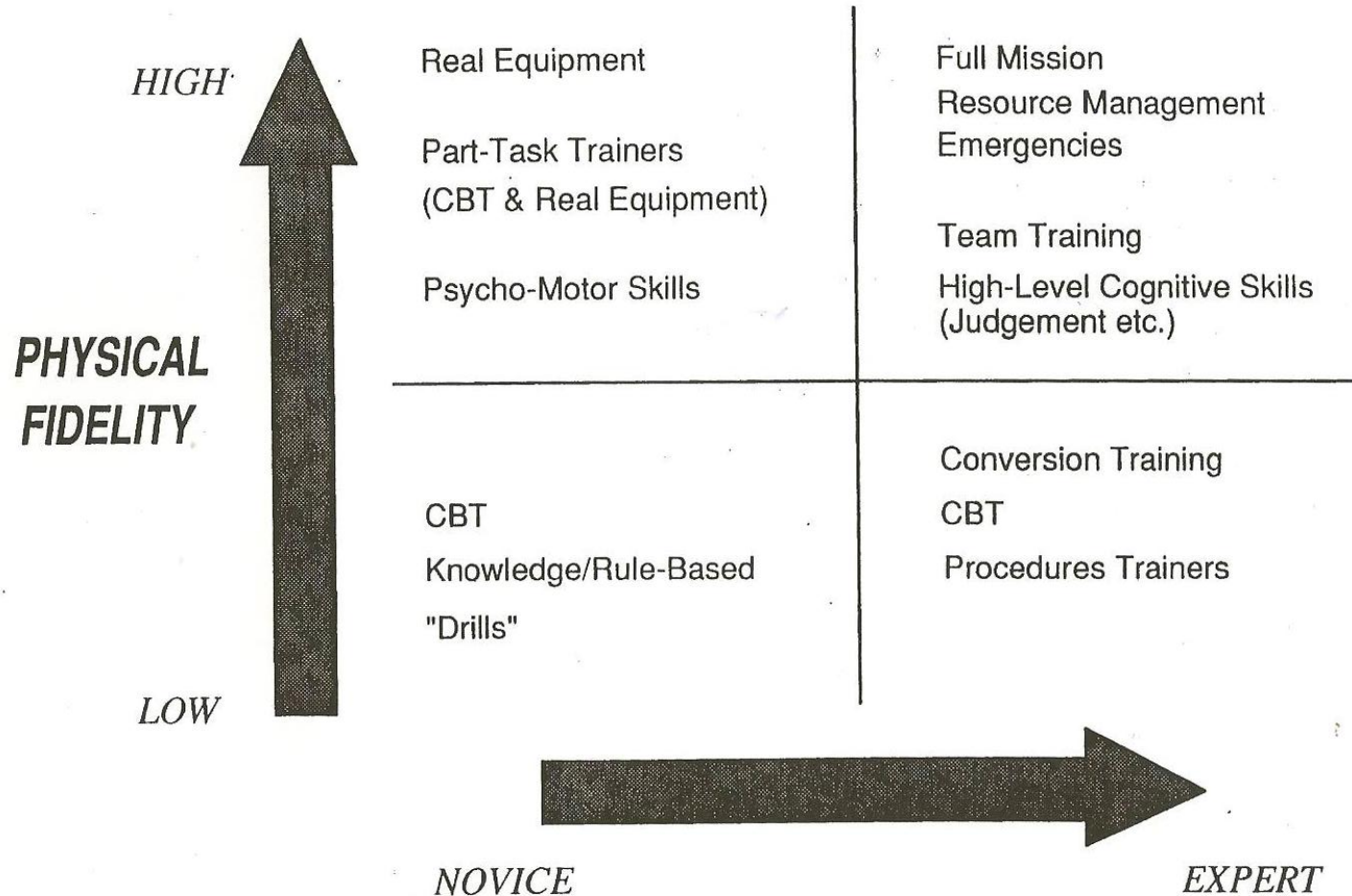
Properties of any simulator

- It has a specific training ***purpose***
- it has ***realism*** but sufficient only to satisfy the training objectives (simulator fidelity).
- it allows a trainee to learn ***experientially*** through ***practising a skill***
- it must allow ***positive transfer*** of the training to the workplace (otherwise it is a video game), and avoid ***negative transfer***
- it may allow a candidate to ***demonstrate*** competence
- it ***omits*** some aspect of reality to enhance learning (otherwise it is the real thing in a simulated environment)

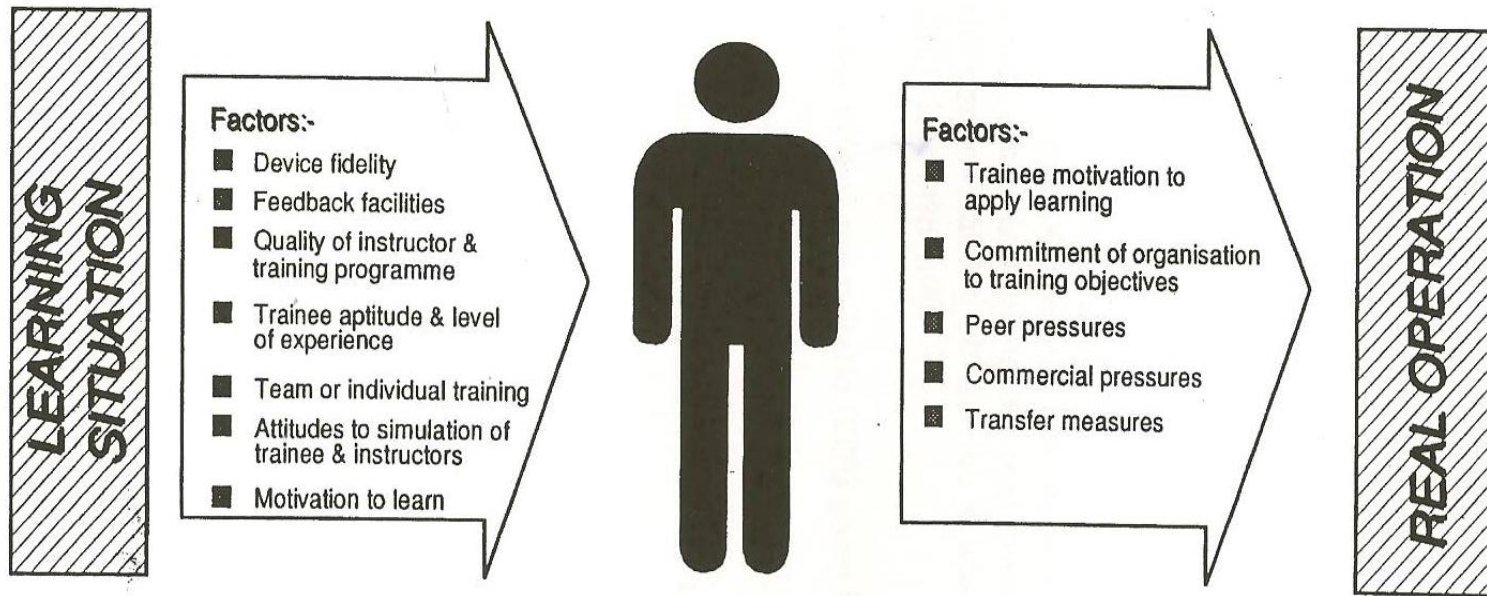
So far so good, for the orange....

....but finally, it allows an instructor to ***interact synchronously*** with the trainee to ***control the learning experience*** (can the orange do this?)

Aspects of Physical Fidelity



A Model of Transfer



The ABC of Learning

A is for Antecedents

B is for Behaviour

C is for Consequences

- Source: Pekcan, C.H. et al (2005) “Content and Context: Understanding the complexities of human behaviour in ship operation” Proc. Int Conf. Human Factors in Ship Design and Operation. RINA. February 2005

Consequences

“Debriefing is the key to the entire learning process during which trainees’ knowledge and attitudes are applied, tested, analysed, and synthesised” .

Simulation and Pedagogy

	Surface Learning	Deep Learning
Teacher-centred	Demonstration of principles	Complex CRM exercises involving both technical and non-technical skills. “Expert” debriefing
Student-centred	Exercises to practice technical skills No de-brief	Complex CRM exercises involving both technical and non-technical skills. Peer de-briefing with facilitator

Resource Management Skills

SOCIAL	COGNITIVE
Co-operation Open communication Consideration of others Team working	Situational Awareness System assessment Risk assessment Anticipation of future events
Leadership and Managerial Skills Situational leadership Assertiveness Planning and coordinating	Decision-Making Problem diagnosis Option generation Option selection Critical Thinking

What is Situational Awareness?

- Situation assessment: “*what is going on?*”
- Decision making: “*what shall I do about it?*”

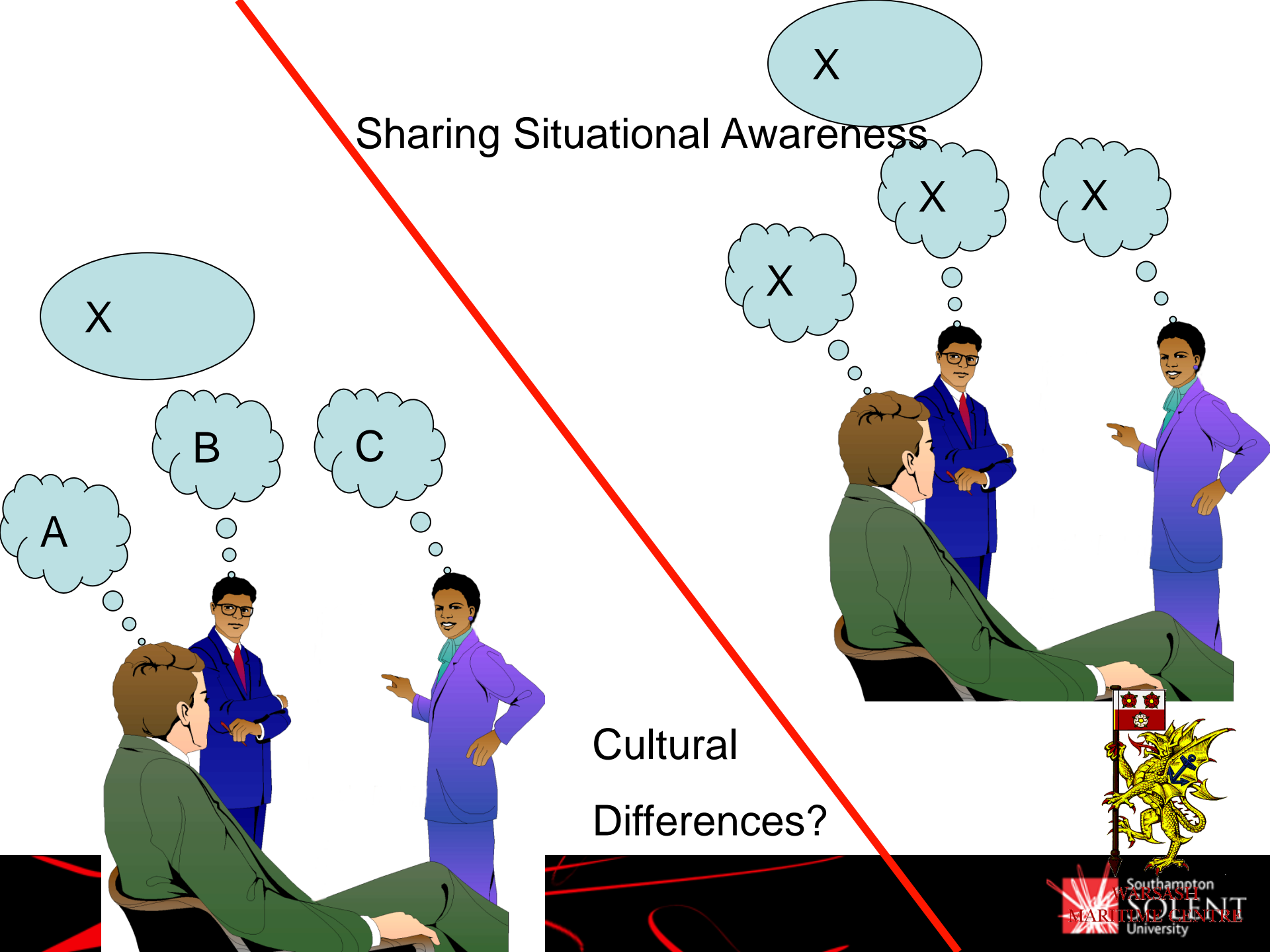
Situational awareness is one of the key non-technical skills which make up the general skills set of resource management.



Mental models – novice and expert

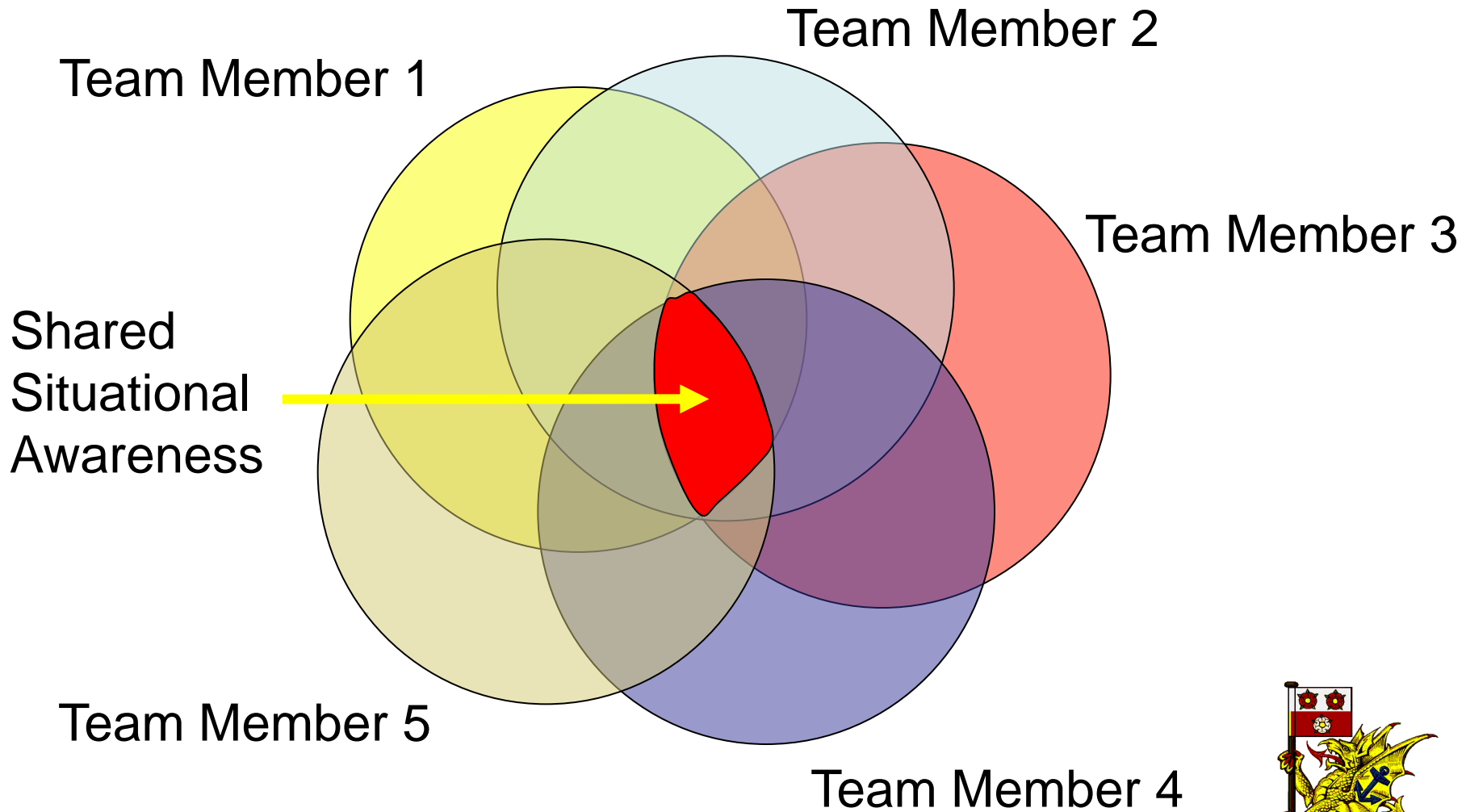


Sharing Situational Awareness



Cultural
Differences?





Further Information

- Log-in to our “maritime human factors” website:

<http://solent.ac.uk/mhfr>

- mike.barnett@solent.ac.uk
- claire.pekcan@solent.ac.uk
- david.gatfield@solent.ac.uk