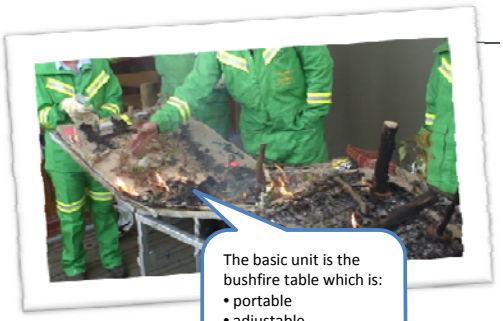
BUSHFIRE SIMULATION TABLE – A VERSATILE AND ADAPTABLE LEARNING TOOL.

Annette Salter, PhD Research student
Faculty of Education, University of Tasmania, Tasmania

"It's not like someone's giving the information and you just sit there absorbing – you're involved in making decisions on the table and you've got to wear those decisions as well."



The basic unit is the bushfire table which is:
- portable
- adjustable
- Fire moves along a hessian surface

Introduction

This PhD study uses an evidence-based approach to examining the use of a training tool – *the bushfire simulation table* - to indentify how it's being effectively used to train in the discipline of bushfire behaviour. By examining the use of this new learning tool in real training situations, this study is developing good teaching and learning models; it also considers how to build trainer capability in this discipline and how to improve assessment and curriculum when using new tools. This poster presents another major set of findings from the study – what we have learned about how adaptable and versatile this system is when training bushfire fighters.

Usable? Relevant? Adaptable?

Usability and contextualisation are two key factors that influence good implementation of new training tools[1]. Many current simulation-based training tools in this field often fall short of the mark; they can be too expensive to produce or to replicate and technical to operate and , as they can require expensive hardware, they are inaccessible to trainers who don't have access to dedicated, higher-end training facilities[2]. However, as computer-based tools can replicate fire and fire spread, they can contextualise important aspects of this discipline for training bushfire fighters.

Omodei et al(2004)[3], indentified 22 criteria for assessing the key contextualising factors that are required for these tools to be effective. My study has adapted these criteria in order to apply them to the *bushfire simulation table,* a non-computer-based tool. The study seeks to examine how this practical training tool performs in relation to the criteria developed for assessing computerised simulation tools and the three tables in this poster indicate some of the findings of my study.

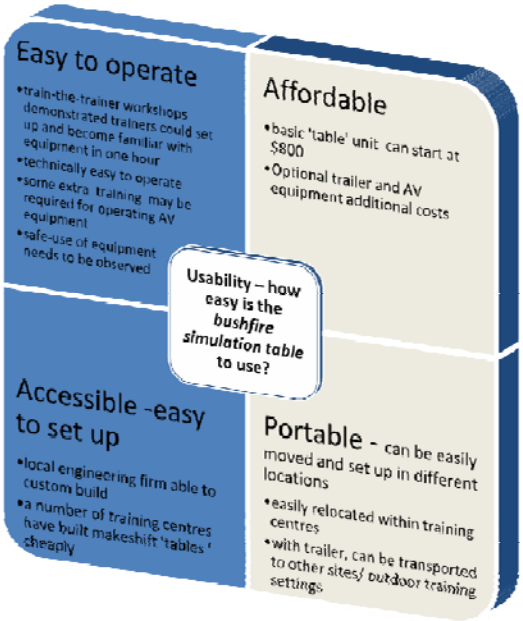
"It really showed how fire behaves ..... but to see it happening while someone was explaining it, the thought processes that go on when you're trying to put the fire out is very good."

Findings from assessing how well the *bushfire simulation table* allows for real-life work issues which are relevant to the discipline.

Criteria	Bushfire simulator table	Teaching and learning points
The trainees should be able to interact with the simulated scenario which should be as non-intrusive (natural) as possible. The aim is for trainees to experience as much as possible the same mental experiences they have in real-world fire fighting.	In interviews trainees reported that they ; • Found the scenarios believable, • felt more connected to the work they would be doing and • Found these sessions motivating.	• Higher levels of learner motivation lead to trainees connecting the content with their prior knowledge • Opportunities to involve the trainees in decision making, helps to guide trainees' acquisition of knowledge as well as involving and motivating them.
The system's fire spread model has to be able to accommodate a range of fire behaviours (e.g. by provision of different spotting characteristics). The simulation system should accommodate different types of fuel loads and fuel moisture content.	The simulation table models a range of fire behaviours (e.g. intense fire, fast moving fires, spotting as well as varying fuel loads and fuel moisture.) Use of 'simulated' fuel, weather and topography provides scope to examine the effects of the physical phenomena.	• Scenario building around specific bushfire phenomena provides a chance to practice knowledge and to test or challenge principles. • Learners demonstrated better understanding of the principles of fuel, weather and topography.
The *trainees* should be able to continuously interact with the simulated scenario so as to engage fire suppression and communications activities.	Opportunities for trainees to interact with the bushfire are possible and activities such as suppression and communications can occur.	• Learners experience a range of 'simulated' fire suppression techniques. • Skill development is enhanced when learners are provided with a realistic context in which to practice targeted material.
The system should allow the trainer to implement scenarios *or a* set of pre-determined events such as fire outbreaks, changes in weather conditions, etc.	The table provided opportunities for the trainers to demonstrate exemplary problems and scenarios to build learner knowledge of the domain.	• Effective demonstrations of problems /scenarios lead to improved trainee knowledge of 'fire ground' scenarios. • Authentic representation of the real phenomena helps to meet learning objective.

The *bushfire simulation table* allows trainers to create, adapt, reuse and repurpose the resources.*

Simulation scenarios of adequate complexity and variety can be created by the trainer. The trainer is able to implement new scenarios easily.	Simulation scenarios of any level of complexity can be easily and quickly created and/or modified by the local trainer.	The trainers can dynamically introduce new events, or otherwise alter the course of existing events, as the simulation is being run (such as introducing new fires, announcing the failure of crews to arrive, creating sudden wind changes etc.).	The trainer can build scenarios and reproduce these scenarios across different trainees and teams of trainees



The DSE# uses the 'table' to train Basic Fire-fighters, Crew Leaders and Operations Officers. Basic and complex scenarios are created and participants then demonstrate/explain their responses as the scenario unfolds.

Conclusion & References

Simulation-based training provides unique opportunities to improve learning outcomes for training in complex workplaces. Empirical research[4] has demonstrated that simulation-based training provides effective outcomes for developing:
- New knowledge and skills
- Team building skills
- Situational awareness

To be successful, these new training tools require two key factors – usability and contextualization[5]. This study has developed a typology for these two factors based on an earlier evaluation model[6] designed specifically for teaching bush firefighters. The *bushfire simulation table,* although a much simpler tool, meets many of these criteria. This new typology provides a pedagogic focus for evaluating new learning tools in this discipline.

2. Sutton, L. (2005). *High Tech versus Low Tech Training.* Boise, Idaho.: National Interagency Fire Center.; 3 & 6.Omodei, M., Elliott,G., Walshe, M. (2004). *Development of Computer Simulated Wildfire Scenarios for the Experimental Investigation of Unsafe Decision Making.* Bushfire Cooperative Research Centre, LaTrobe University.; 4. Pleban, R. J., Matthews, M. D., Salter, M. S., & EAKIN, D. E. (2002). Training and assessing complex decision-making in a virtual environment. Perceptual and motor skills, 94(3), 871–882.; 1 & 5. Beetham, H., & Sharpe, R. (2007). *Rethinking pedagogy for a digital age: designing and delivering e-learning.* Psychology Press. * The criteria on these tables are adapted from Omodei et al(2004). # DSE – Department of Sustainability and Environment are partner/participants for this PhD study.

Want to know more?
Contact : Annette Salter
(03) 62 26 7880
Annette.Salter@utas.edu.au