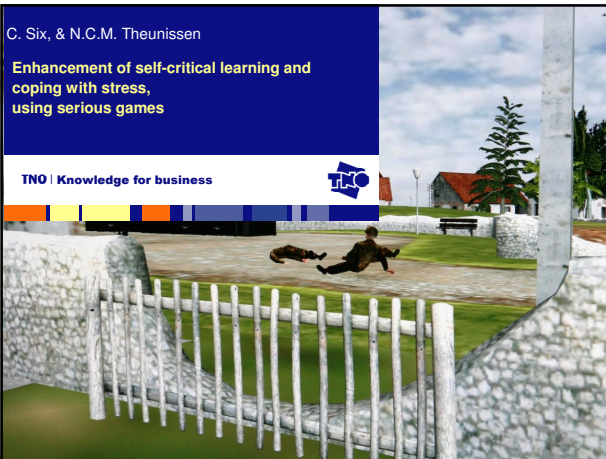


C. Six, & N.C.M. Theunissen

### Enhancement of self-critical learning and coping with stress, using serious games

TNO | Knowledge for business



## Challenge

1. Disaster and emergency personnel need to:
  - master a variety of specific medical competences
  - be trained for stressful context

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## Reported stressful context

- Information (inaccurate, unreliable and continually changing)
- Loss of control
- Danger of threat for own life
- Time pressure
- Group pressure
- Working alone
- Ethical dilemma's
- Specific patients
- Practical difficulties
- Dizziness and nausea
- Improvisation

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## Challenge

1. Disaster and emergency personnel need to:
  - master a variety of specific medical competences
  - be trained for stressful context
2. Stressful circumstances: change with every new deployment & individuals cope differently with them
3. Medical competences: requires continuous learning



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## Learners' characteristics

Medical disaster and emergency personnel:

- are highly educated
- are expected to be self critical individuals
- have different learning and coping styles
- want to have an important say in how and when they want to learn
- require continuous training

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## Learning didactics

Learning challenge:

- (stressful) context & medical performance
- continuous learning
- learners' characteristics



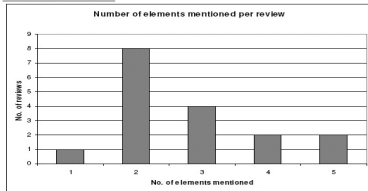
Learning didactics: Self Directed Adult Learning

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## Self Directed Adult Learning

1. Taking active control (where, when, what and how)
2. Self-regulating learning strategies
3. Reflection (on the task and on the learning process)
4. Interaction with social environment (colleges, coach)
5. Interaction with physical environment

Figure 1: Number of elements that support Self-Directed Learning mentioned in reviews



Stubbs, Theunissen, N.C.M. (2008). Self-directed adult learning in a ubiquitous learning environment: a meta-review. Proceedings - Special Track on Technology Support for Self-Organised Learners during 4th EduMedia 2009 Conference 02 - 03 June 2008 in Salzburg

## Learning method: aspects of Self-Directed Adult Learning (SLAD)

Aspects of SLAD	Examples of learner behavior
<b>Learner control</b>	More knowledge on head trauma's: relevant book, expert's advice, a one-day course...
<b>Self-regulating learning strategies</b>	Gap between required performance and actual competencies Personalized way of covering that gap
<b>Reflection</b>	Difficult case; feedback on performance, self critical thoughts
<b>Social environment</b>	Learn from other's performance and behaviors; how to deal with ethical dilemma's, ambiguous protocols..
<b>Physical environment</b>	Simulation of difficult trauma's with real context difficulties; physical (like nausea) and mental (social pressure)

## Learning didactics

### Learning challenge:

- (stressful) context & medical performance
- continuous learning
- learners' characteristics



Learning didactics: Self Directed Adult Learning



Learning technology: Serious Games

## Serious Games

	Aspects of Serious Games
1	Lean forward media & interaction Actively give sense to the experience
2	Information and feedback from the game on task performance, game approach and coping skills
3	Feedback is instant and personalized Experiment with experiences and feelings Discover and enhance own coping style's The willing sense of disbelief
4	Stressful relations (group pressure) Enhancement of coping (social cohesion)
5	The complete context of a task (stressful elements) Flow, due to personalized task difficulty

## & Self Directed Learning

Aspects of Serious Games	Aspects of SLAD
Lean forward media & interaction Actively give sense to the experience	<b>Learner control</b>
Information and feedback from the game on task performance, game approach and coping skills	<b>Self-regulating learning strategies</b>
Feedback is instant and personalized Experiment with experiences and feelings Discover and enhance own coping style's The willing sense of disbelief	<b>Reflection</b>
Stressful relations (group pressure) Enhancement of coping (social cohesion)	<b>Social environment</b>
The complete context of a task (stressful elements) Flow, due to personalized task difficulty	<b>Physical environment</b>

## Research for Disaster and Emergency Medicine Domain

1. Theoretically serious gaming could be useful
2. There are no games available that include all the above characteristics
3. Study on the possibility of serious gaming for medical personnel

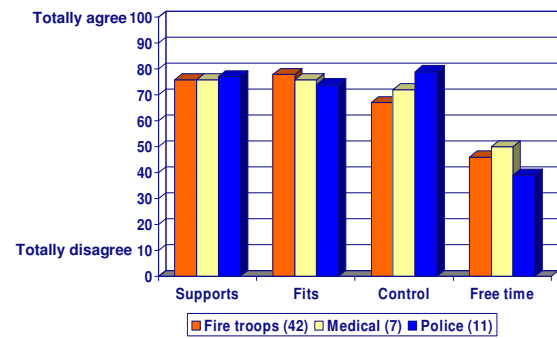
First responders (n=62) about the scenario  
'Virtual reality simulating a crisis'

0 = totally disagree to 100= totally agree

Scales	M	(SE)	items	$\alpha$
Supportive for preparation on disaster	76	(3.25)	6	.93
Can fit in the organization	76	(3.19)	4	.88
Decide yourself how to prepare	72	(4.60)	1	-
Like to do this in my free time	46	(5.86)	1	-

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Virtual gaming by discipline



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Concluding

Learning challenge: (stressful) context & medical performance, continuous learning & learners' characteristics



Learning didactics: Self Directed Adult Learning



Learning technology: Serious Games



Learner: continuous, personalized learning, intrinsic motivation

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More information?

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