



# Educational strategies in bushfire behaviour training: the case of the bushfire behaviour table.

Annette Salter,

University of Tasmania, Tasmania, PhD Candidate.

**what are training  
concerns for bushfire  
fighters in Australia?...**

# CHALLENGES

## Building fire-fighter skills....Australian context

a) *Select Committee on Agricultural and Related Industries: The Incidence and Severity of Bushfires across Australia, Commonwealth of Australia, 2010.*

.....the importance of mitigating the severity and effects of fires in Australia's southern areas because of their higher intensity and greater potential for harm.

CSIRO, *Submission 15*, p. 3. See also Dr Richard Williams, *Committee Hansard*, 14 May 2010, Canberra, p. 33 in Commonwealth of Australia, 2010, p. 4).

Parliament of Victoria. (2009). 2009 Victorian Bushfires Royal Commission, Recommendations. p.3.

# CHALLENGES

## Building fire-fighter skills....Australian context

- Decline in personnel with bushfire knowledge and skills,
- decline in the number of volunteer fire fighters,
- Fewer forestry students....e.g.

“.....only 30-35 students would graduate with a university forestry qualification in 2010, **short of the 50-100 required.**”

Professor Peter Kanowski, Committee Hansard, 12 March 2010, Canberra, p. 38, in Commonwealth of Australia, 2010, p. 123.

- Reduced forestry and farm workers to be volunteers.

# CHALLENGES

## Building fire-fighter skills....Australian context

“*[volunteers]* have cut their teeth on burning on roadsides as part of hazard reduction ..... That is used jointly as a training exercise. It is vastly reduced now because of the protocols that are put on hazard reduction burning on roadsides because of native vegetation laws and conservation laws.”

Victorian Lands Alliance, Committee Hansard, Melbourne, 25 March 2010, p 47,  
Commonwealth of Australia, 2010, p. 125.

“.....the pool of physically fit, healthy and experienced fire fighters has diminished”.

Australian Forest Growers, Submission 16, p.4 in Commonwealth of Australia, 2010,  
p. 125.

“Learning and training are fundamental to bushfire mitigation and management and are relevant for volunteer and career fire-fighters as well as land managers.”

The Council of Australian Governments (COAG). (2004). *Report of the National Inquiry on Bushfire Mitigation and Management*. Retrieved from March 26, 2010  
<http://coagbushfireenquiry.gov.au/report/summary.htm#knowledge>.

# CHALLENGES

## Building fire-fighter skills....Australian context

several obstacles....

- the transition from curriculum based training to a competency-based system,
- enormous cost of providing minimum-competency training to 180,000 volunteers
- the need to overcome volunteers' reluctance to sacrifice additional time for formal training.
- Better learning cultures....

The Council of Australian Governments (COAG) (2004),  
p.xvii.

“.....We need to maintain depth of knowledge and practical experience of fire behaviour to ensure adequate prescribed burning will be possible.”

Select Committee on Agricultural and Related Industries: The Incidence and Severity of Bushfires across Australia, 2010, p. 130.



**What are these strategies,  
what's the challenge?...**



## Aids learning.....

- Representing concepts,
- replicate environments or scenarios &
  - simulate and model.
- Engage learners and stimulate interest.

## Strong strategies require...

- clear purpose,
- good teaching practices,
- goal-based activity and
- good discursive practices.

# THEORY – KEY COMPONENTS

Using simulated educational strategies....

Social constructivist learning theory helps to frame the problem of learning;

.....shifts the perspective from learning as a transmissive model to seeing learning as a sense making activity.

Key theorists include... Vygotsky, Wertsch, Kolb, Bruner, Lave, Wenger.

What are the elements of facilitating effective learning in a simulated bushfire learning context?

How does “the bushfire-table,” engage students in the dynamics of fire-behaviour and build better skills?

- How do instructors facilitate learning for entry level fire-fighter trainees?
- What are their theories of pedagogical practice?
- How do trainees experience this instruction and what do they learn?
- In what ways does the opportunity for learning change with the introduction of an innovating approach?

A qualitative design included;

- semi-structured interviews with 22 trainees, 8 trainers.

Other data sources included;

- coursework documents and materials,
- classroom observations (3 week-long camps, 60 hours) and
- transcribed video data of teaching sequences (a traditional instructional format and new simulation approach) &
- learner's assessment responses - structured oral exam(interviews) 25 trainees.



How do trainers facilitate learning for entry level fire-fighter trainees?

# TEACHING APPROACHES AND RATIONALES?

Results.....

*“.....we didn't really know where anyone was up to....I don't know whether we really need to know all of that, to know that one person isn't really there, we refocus on what we are trying to do....”*

*...so we are more assessing our own delivery. It has been delivered, then why don't they know?...*

What are their theories of pedagogical practices?

## *Findings 1:*

*....show that trainers typically use a lecture-style delivery with an emphasis on instruction rather than a model that focuses on learning.*

# TRAINEES PERSPECTIVE – LEARNING?

Results..... 2 core challenges;

1. Delivery of lecture-based training –  
12 of 22 trainees interviewed expressed concerns.

“..the same stuff over and over again. I can't keep concentration and just fall asleep - that's when I get my sunglasses out.”

# TRAINEES PERSPECTIVE – LEARNING?

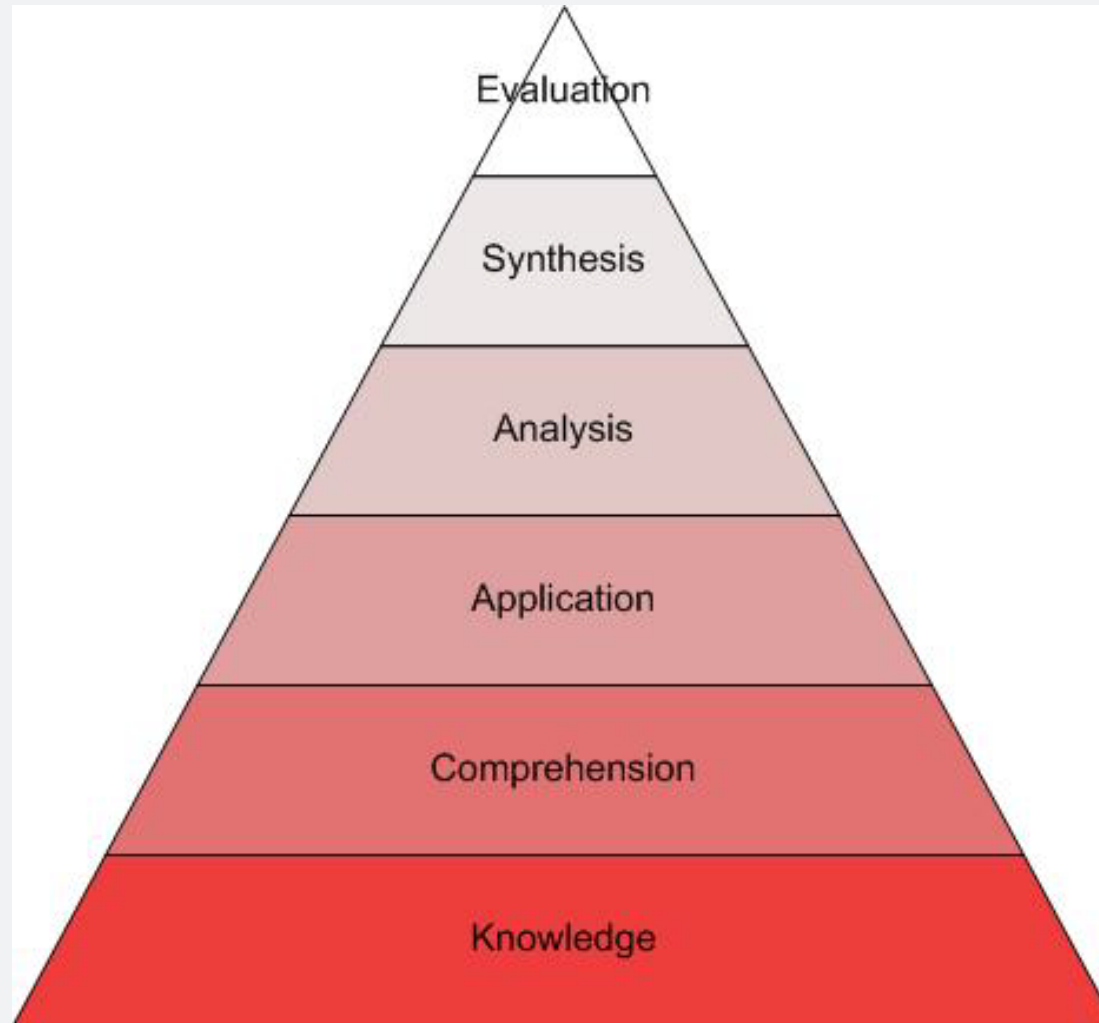
Results..... 2 core challenges;

2. ...understanding the content - 12 of 22 trainees interviewed expressed concerns.

“There’s a vagueness...does this matter to me?...that’s what people have to struggle with. Is this just general information or is it something we really need to remember? Because there’s a hell of a lot to remember anyway.

# TRAINEES PERSPECTIVE – LEARNING?

Results.....



# RESULTS - TRAINEES PERSPECTIVE – LEARNING?

Using multimedia educational strategies.....

## GFF written assessment – cognitive processes

Bloom's Cognitive Process Dimension <sup>6</sup>						
	Remember 1.	Understand 2.	Apply 3.	Analyze 4.	Evaluate 5.	Create 6.
No. of questions	48	20				
Example of questions	What is DSE'S basic obligation in relation to the suppression of wildfires on Public Land? What are 3 roles and responsibilities a General Fire-fighter may have at a fire.	How does 'air temperature' affect fire behaviour? How does 'relative humidity' (RH) affect fire behaviour?				

## *Findings 2:*

....when looking at learning from the trainees perspective, **learners tend to disengage with this training and become passive.**



In what ways does the opportunity for learning change with the introduction of this new technology and strategy (the bushfire simulation table) and what are the implications?

## Cognitive apprenticeship model .....

- social processes that incorporate active participation within simulated environments and activities,
- *authentic contexts* that reflect the way the knowledge will be used in real life..

Collins et al., 1989; Lave and Wenger, 1991; Jarvela, 1995.























.....learners develop conceptual understanding by participating in problems related to their real-world activities while interacting with experts.

(De Bruijn, 1995).





What's it going to do when it reaches this slope of 20 degrees? How fast is it going?"





.. 'cause the fuels  
pretty moist  
down there...

What's  
your  
theory?



What's it going to do  
when it reaches this  
slope of 20 degrees?  
How fast is it going?"

4 kilometres  
per hour.

# NEW LEARNING APPROACH?

Results.....

Traditional approach – 12 questions

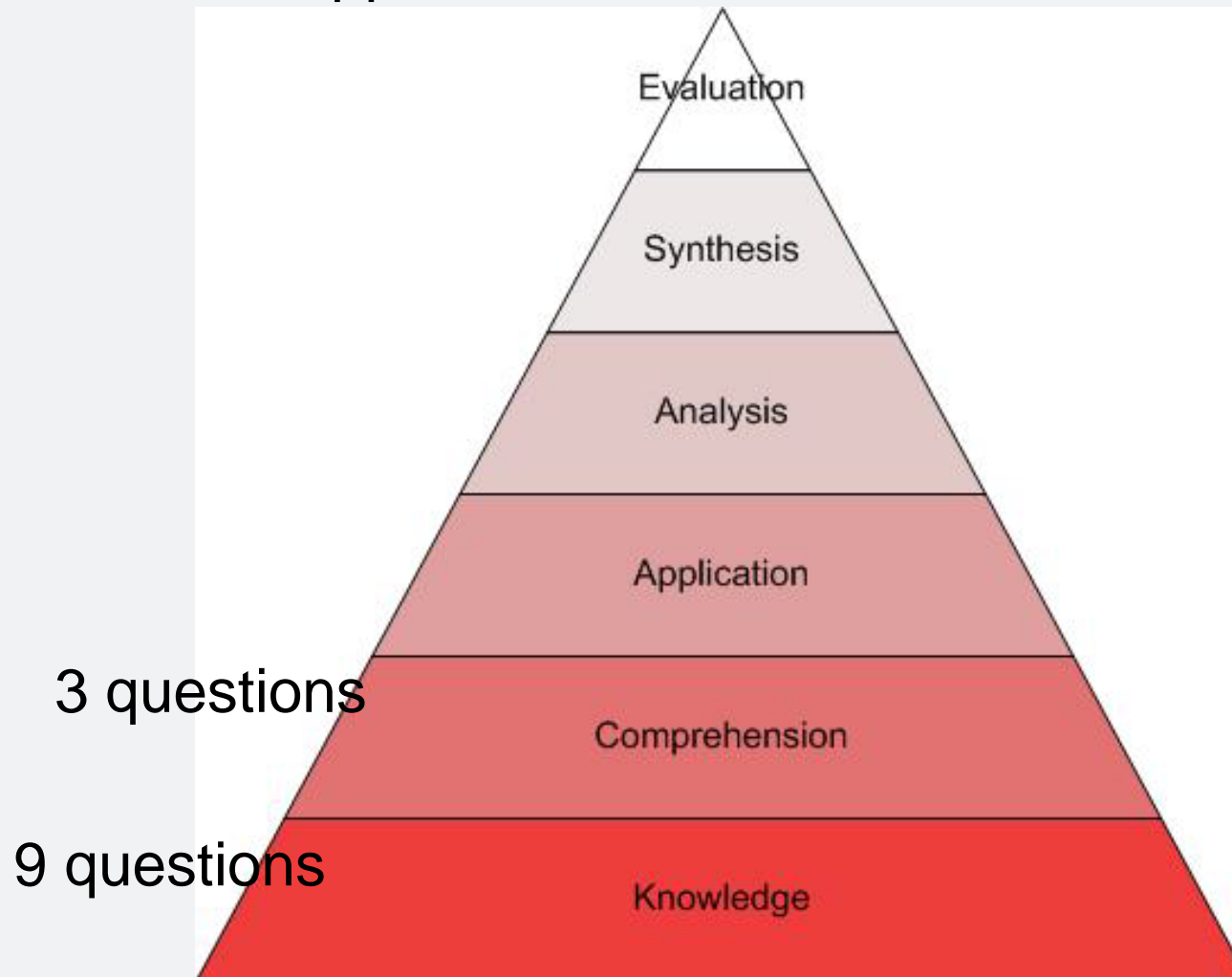
New approach – 61 questions

Number of questions asked in an hour long session.

# TRAINEES PERSPECTIVE – LEARNING?

Results.....

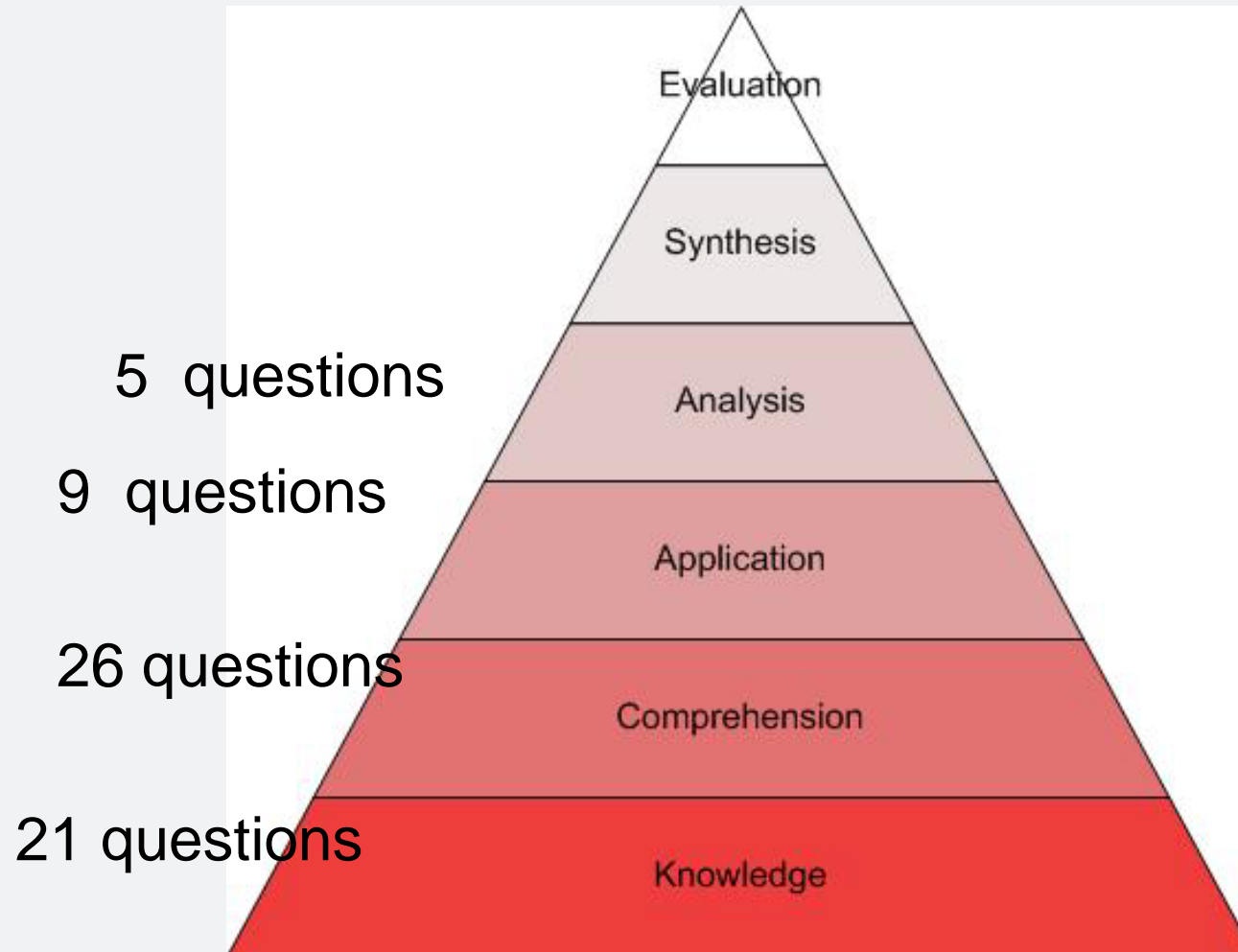
## Traditional approach



# TRAINEES PERSPECTIVE – LEARNING?

Results.....

New approach

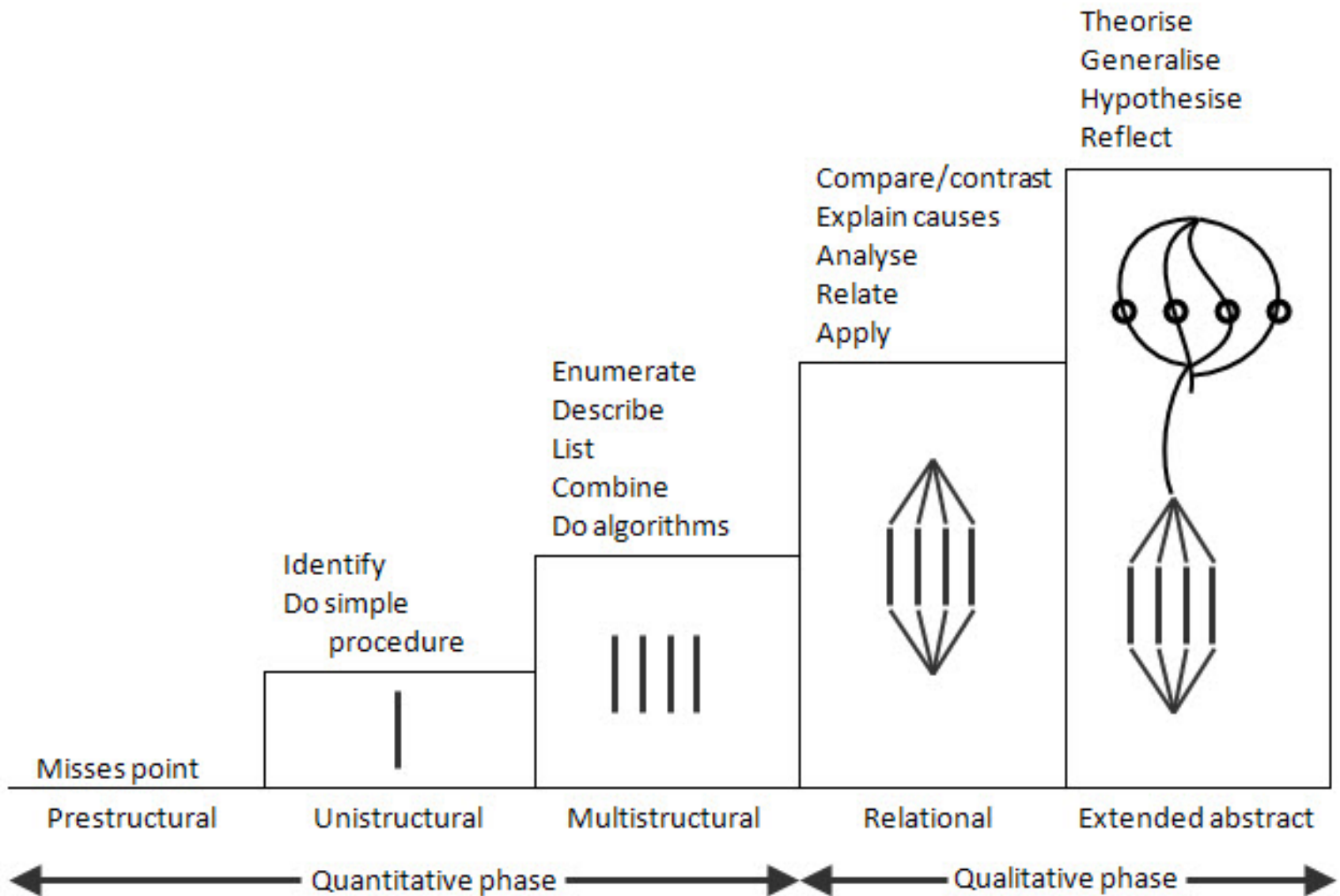




## **Results 3 -**

**...socially situated instruction  
deliberatively engages trainees and lifts  
their thinking skills in analysis and  
evaluation,**

- trainees are able to become actively engaged and develop a higher order of understanding.**



Watch this space !

.....suggest that trainers' pedagogical practices as well as the curriculum assessment processes will need to change in order to promote the higher level of understanding and skills needed to tackle the challenges facing the industry.

Thankyou for listening !