

Notes from a classroom: dual use awareness raising

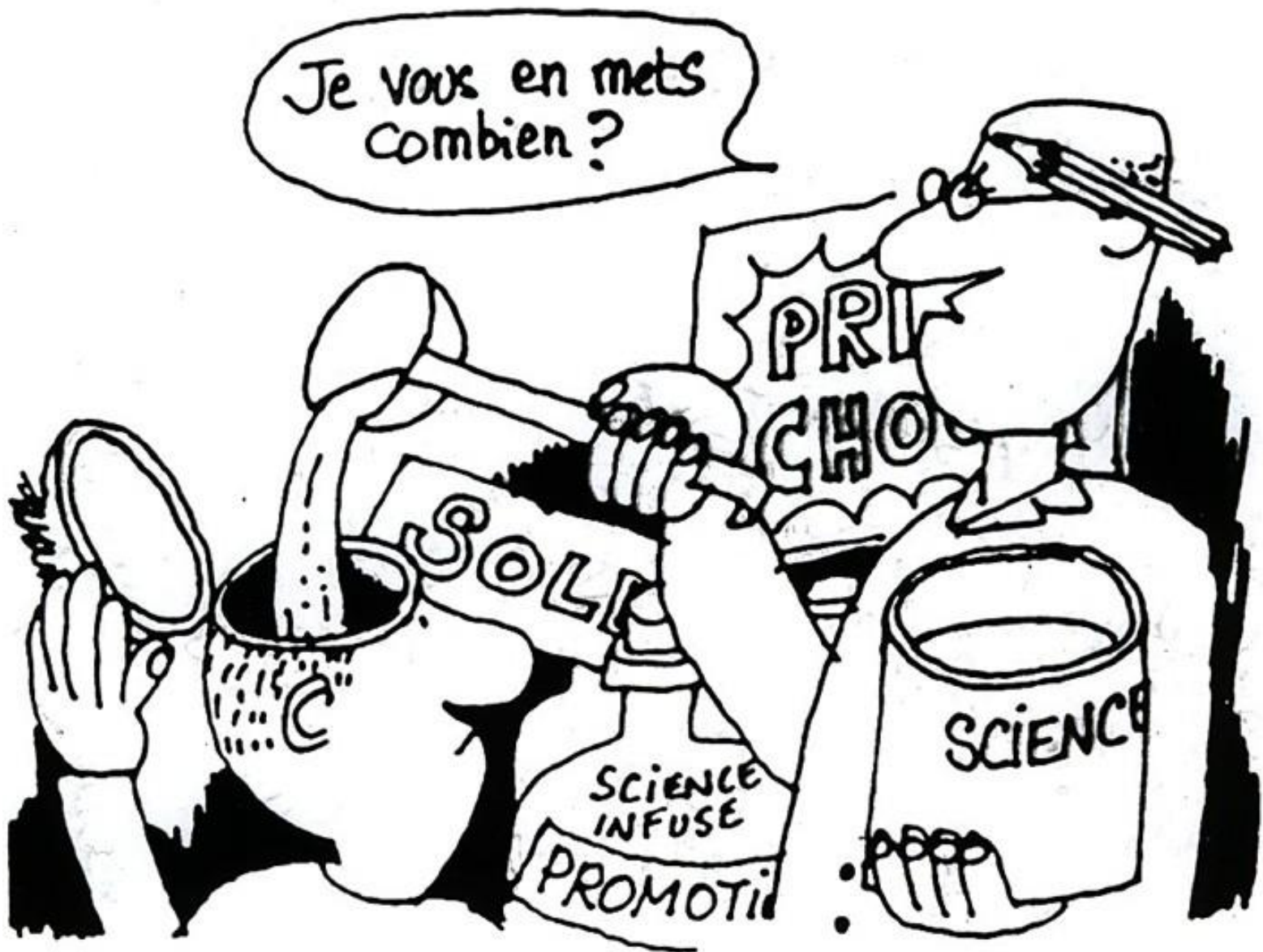
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Outline of talk

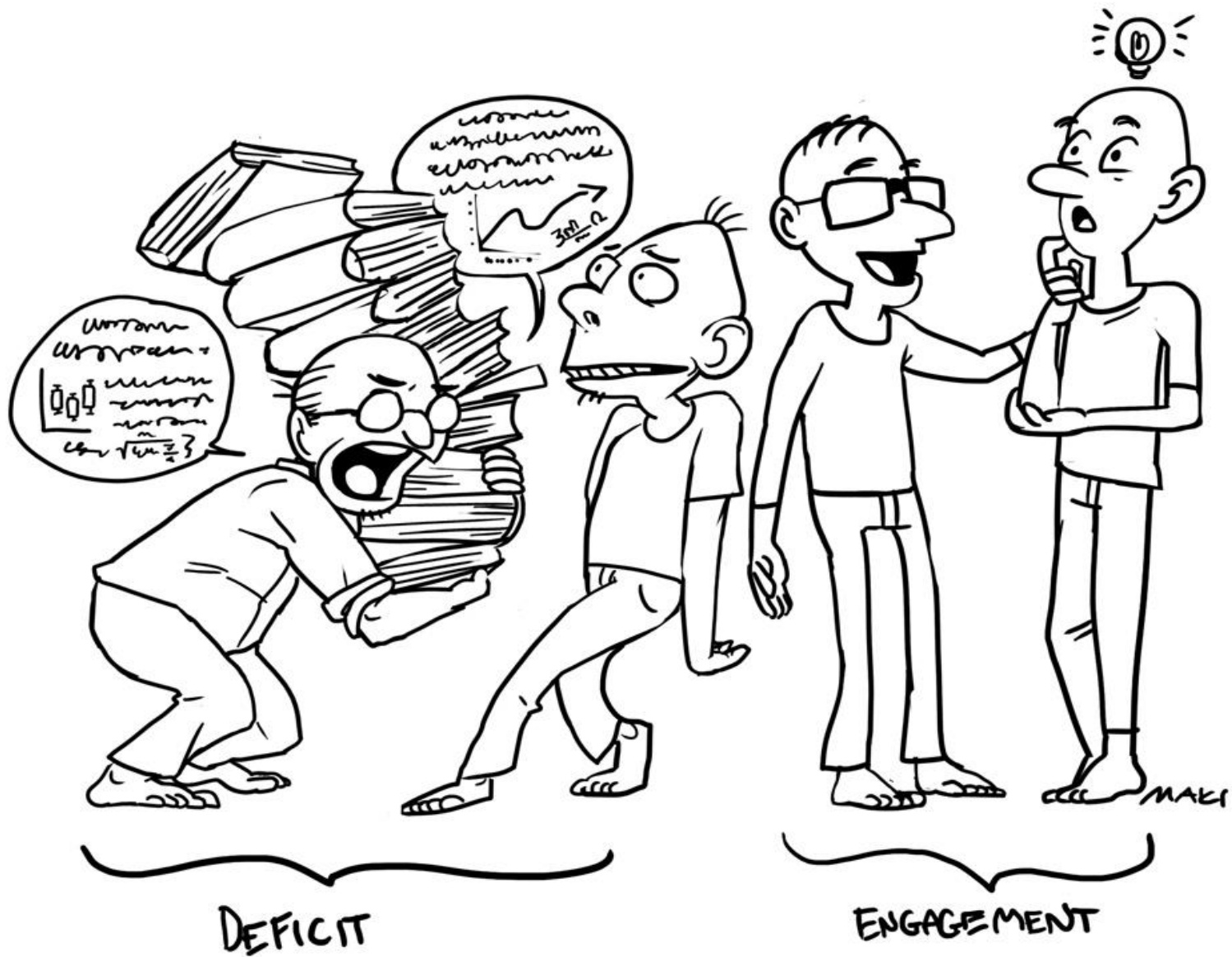
1. What the literature says about teaching and learning
 - How not to communicate: the deficit model
 - Edgar Dale's learning pyramid and types of learning
2. From theory to a classroom
 - Context of teaching
 - Examples of learning by discussion, learning by doing, learning by teaching others
3. From a classroom to...?
 - Some thoughts on the future

Science communication and learning processes

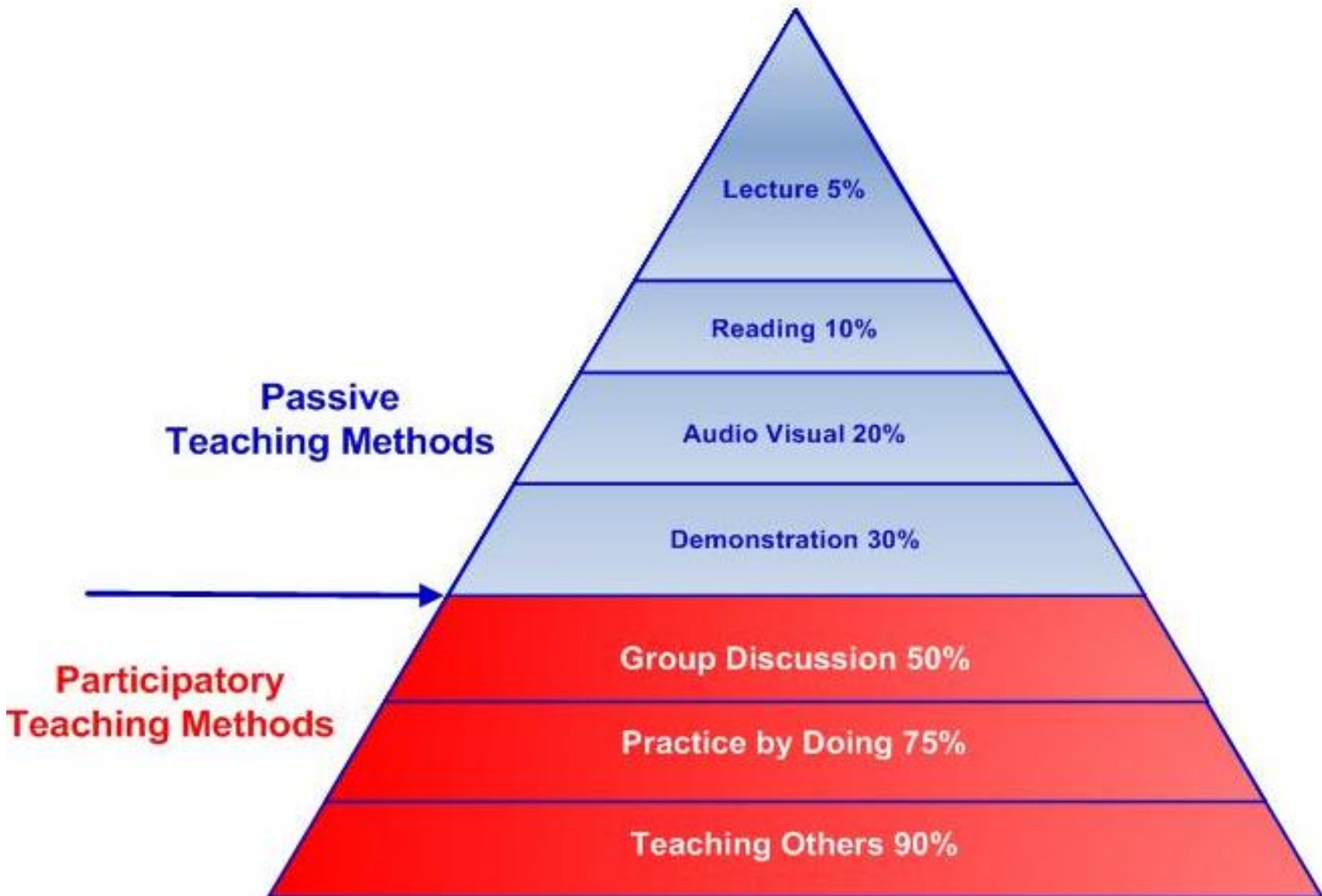
The deficit model of communication



“The “deficit model” is widely held, simple on the surface, and appealing... This model depicts non-scientists simply as not yet informed... In this model, “the science” of an important question is settled, and stands immutable and clear to the experts; the task of communication is simply to explain the facts to the public.”



Edgar Dale's learning pyramid



Teaching method and learning impact

	Level of Impact on the student			
Teaching Method	General awareness of a new approach	Understanding of how to implement the new approach	Internalising the new approach	Ability to apply the new approach in a range of contexts
Presentation of approach through reading				
Modelling new approach through audio-visual means				
Exploring new approach e.g. through role plays				
Constructive feedback on performance				
In-class support e.g. through peer coaching				

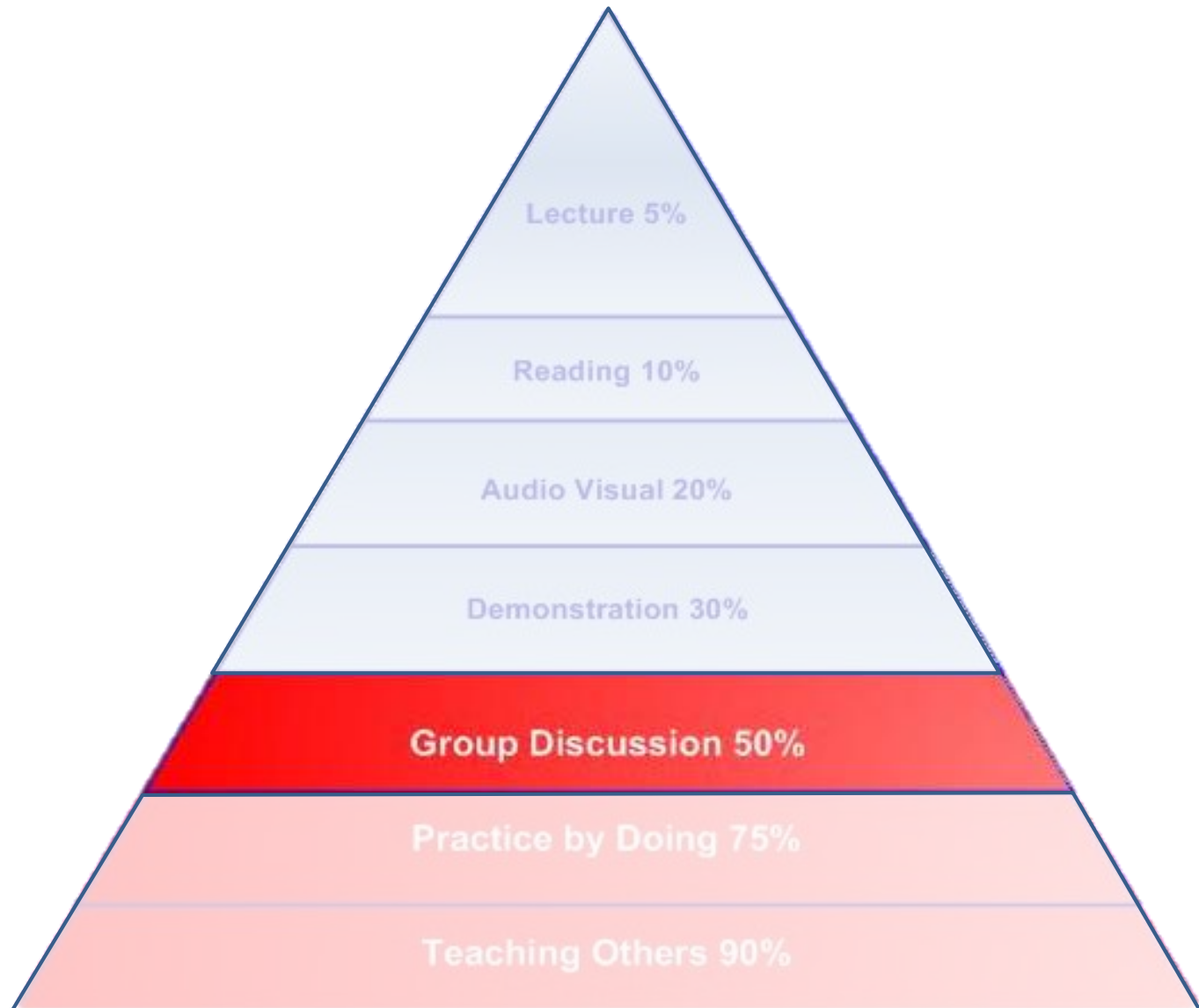
From theory to the classroom

SPRU, University of Sussex

- SPRU is a leading centre of interdisciplinary research on science, technology and innovation policy
- Students come from all over the world and from a variety of backgrounds (not all are scientists)
- Cross campus teaching including in various science schools (life sciences, engineering and infomatics)
- Opportunities for public engagement and in settings other than universities



Learning through group discussion



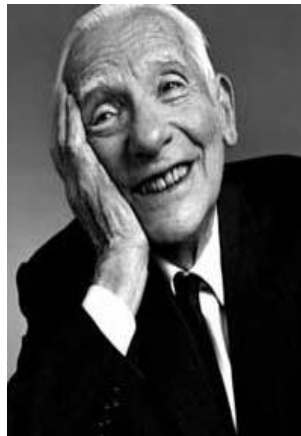
Example: RRI lecture

Method used: a prosopographic approach whereby people from the histories of nuclear, chemical and biological weapons development are introduced to stimulate group discussion

Aims of class: to discuss what is *meant* by responsibility; to discuss the *temporal and social nature* of responsibility; understand the *idea of dual use* and discuss ways which might be used to ensure S&T is not misused



Fritz Harber



Joseph Rotblat

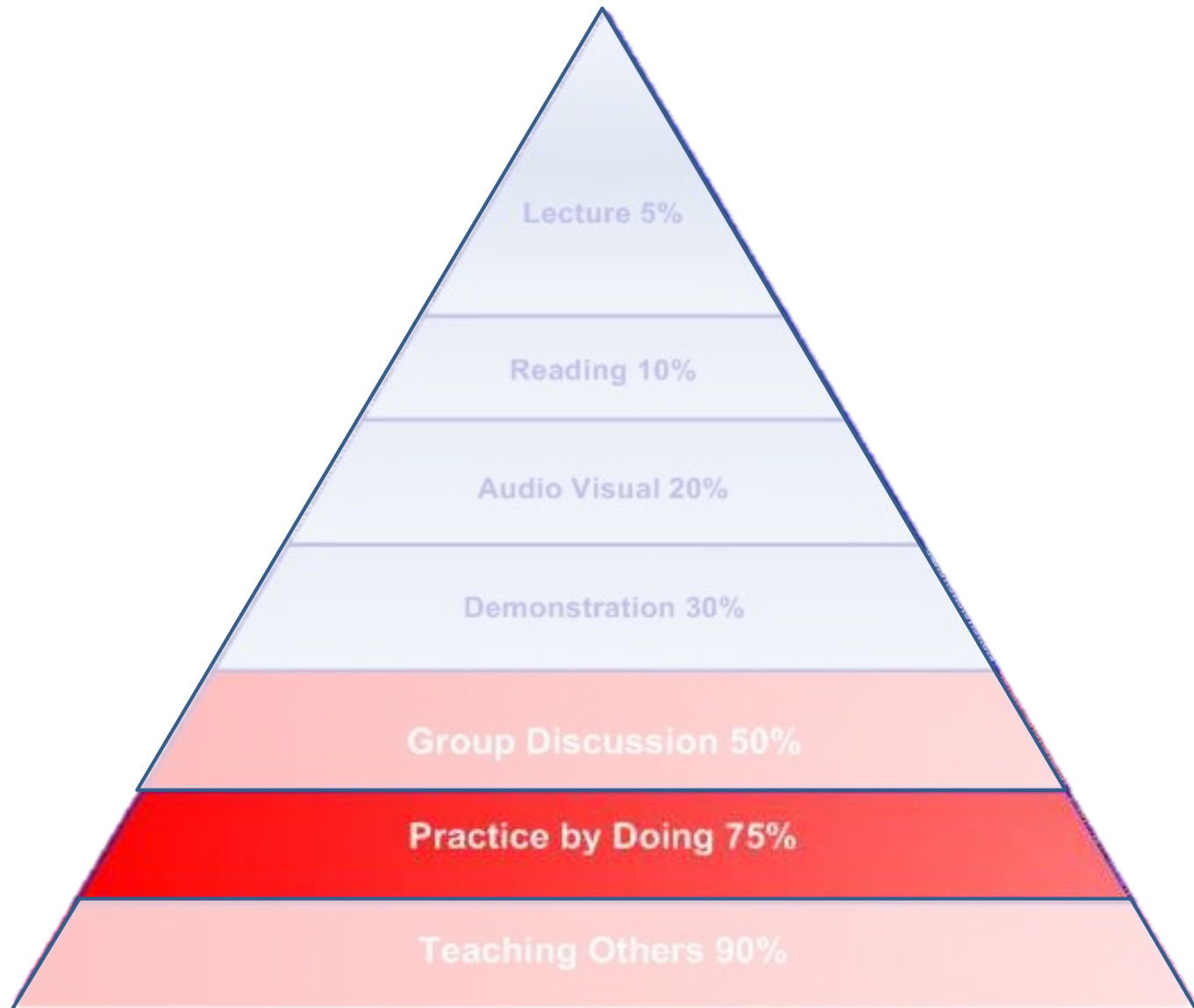


Ken Alibek



Igor Domaradski

Learning through doing



Example: role plays and simulation exercises

Varying times: from 15 minutes to 4 hours so as to enable any opportunity to be used to raise awareness

Designed for varying educational levels: high school, undergrad and postgrad students

Often based in real world events

Students are randomly placed into teams and assigned a role

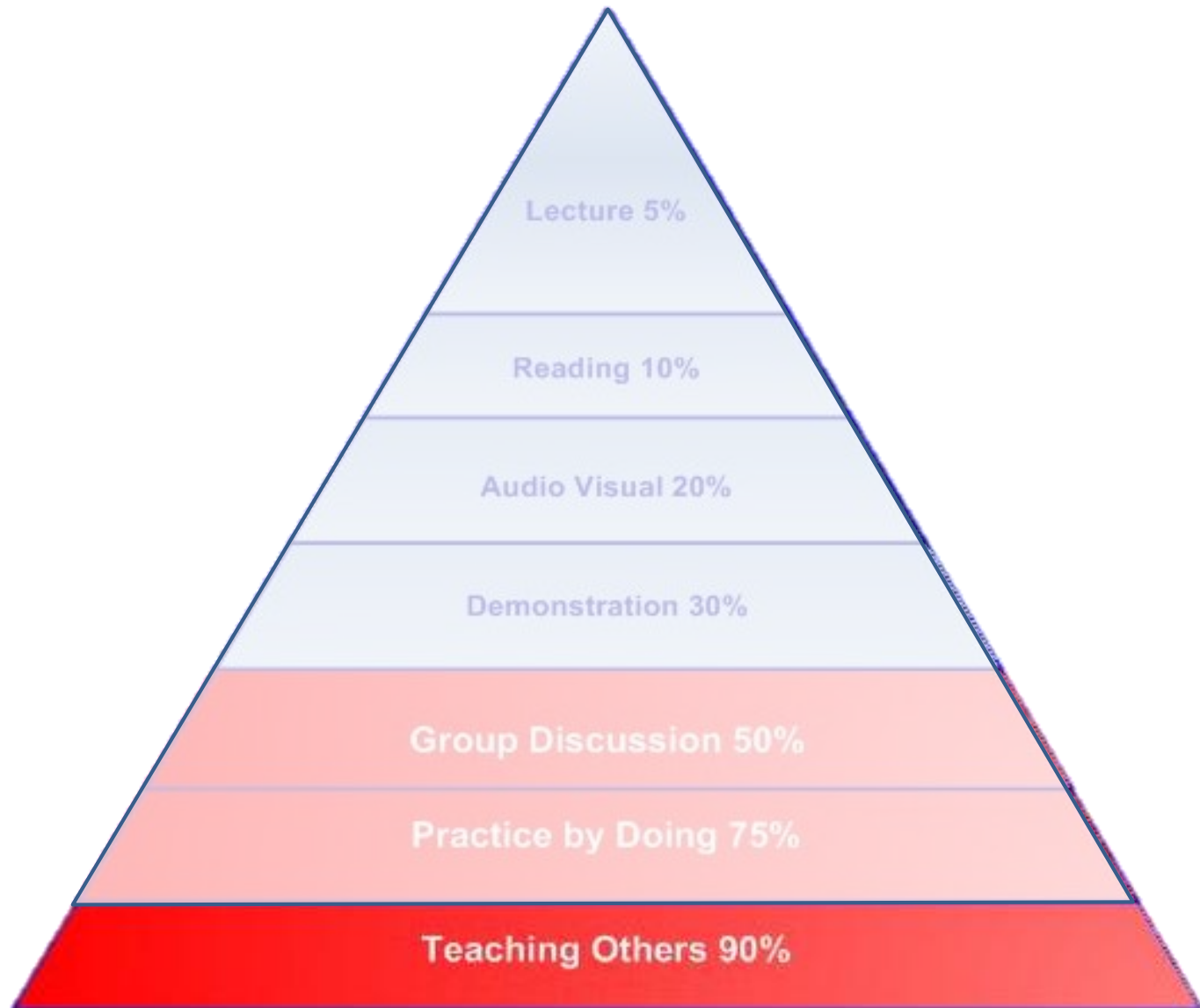
Preparation time enables them to digest information provided and develop a position

Our interventions kept to a minimum so as to allow them to explore the issues

Debriefing session allows for critical reflection and internalisation of learning

For longer role plays sometimes ask for a piece of (non assessed) reflective writing

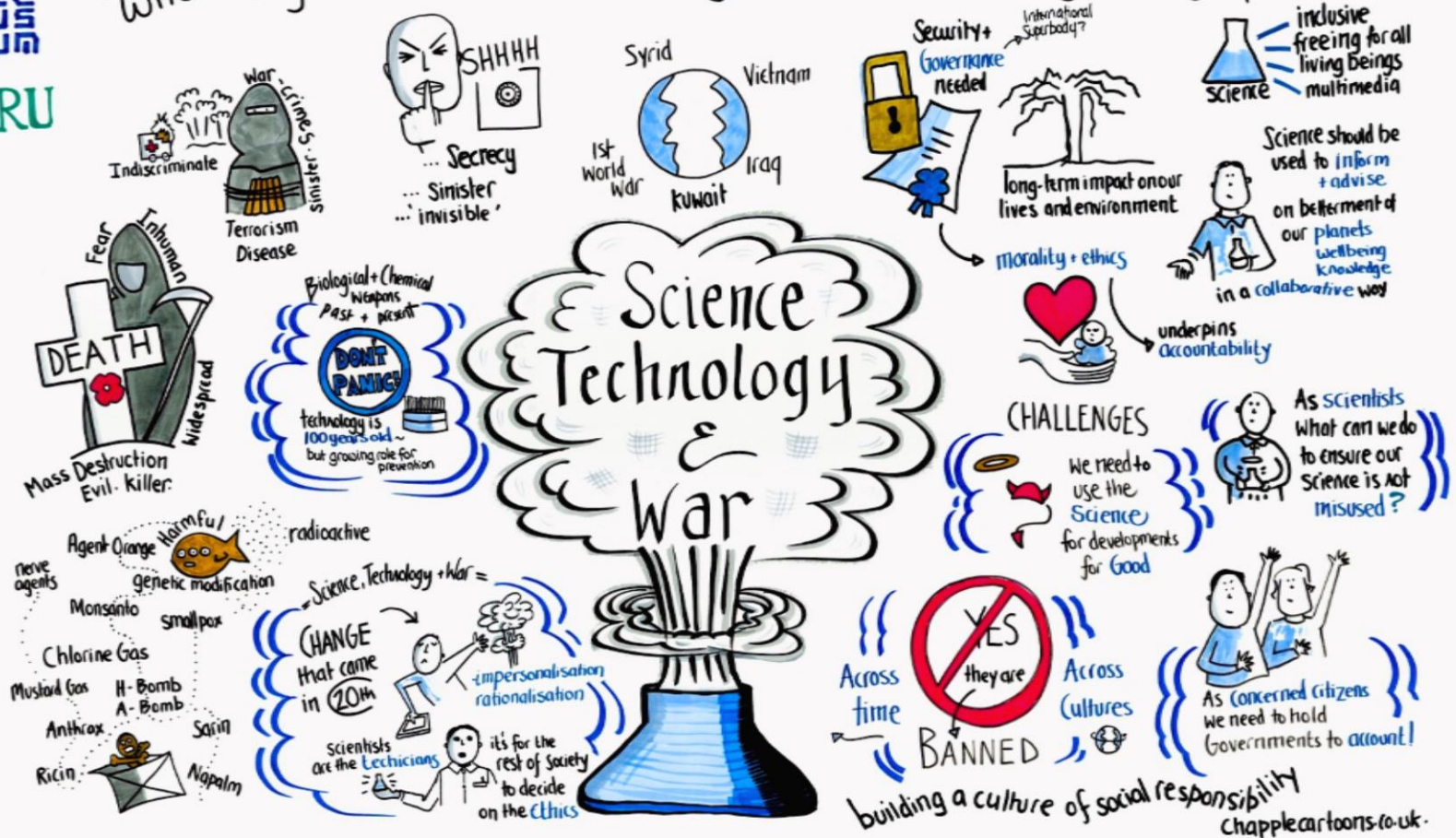
Learning through teaching others



Example: Science Museum event, 8th Nov 2016

SCIENCE
MUSEUM
SPRU

"What do you think when I say chemical & biological weapons?"



From a classroom to...?

How do we sustain and scale up?

Create a tribe

- Begin with 'us' and allow 'us' to become a global community

- Create a space and permission for conversations to take place

- Celebrate the huge amount of work done already and acknowledge that one size doesn't fit all

Imaginative methods

- A blogging network: share the load to ensure high quality, regular output. Increases sustainability

- Café Scientifique: 'science for the price of a coffee'

- TEDx talks: no more than 18 mins

- Art and film: OPCW's Fires project

Keep at the other intervention points

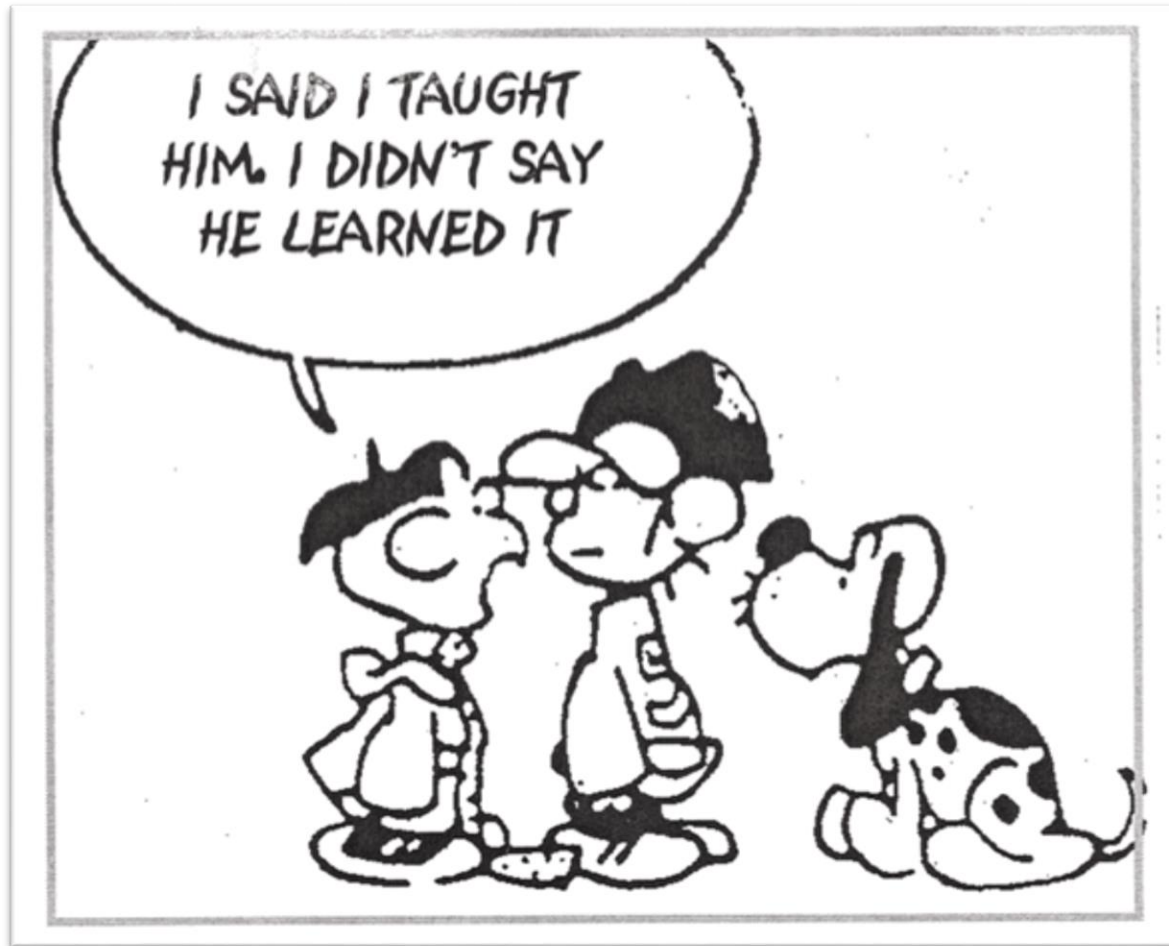
- Textbooks, exam boards, funders

Links to imaginative methods of communication

Café Scientifique: <http://www.cafescientifique.org/>

TEDx talks: <https://www.ted.com/about/programs-initiatives/tedx-program>

OPCW Fires Project: <https://www.thefiresproject.com/>



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