

Format: Workshop

### **Do Urban Myths About Learning and Education Influence Students and Teachers at Chalmers?**

Keywords: Learning styles, Learning pyramid, Problem-based learning, Myth persistence, Myth busting

#### **SHORT SUMMARY**

There are a number of persistent myths about learning and education that could be important to be aware of as a student or teacher at Chalmers. For example, “learning styles” reflect preferences but not what really works best for learners. We will explore a few myths together in this workshop.

#### **ABSTRACT**

##### Introduction to the workshop topic

The title of this presentation is a question, to which we ought to be able to answer an emphatic “no – of course not!” However, a more reasonable answer might be “probably now and then, but let’s systematically reduce the probability!”

The purpose of this workshop is to relate and explore a few myths about learning and education taking our starting point from a recent book by de Bruyckere, Kirschner and Hulshof (2015). I have made a selection of three groups of myths I deem relevant for students and teachers at Chalmers to be aware of, and have designed a set of workshop activities to highlight and discuss.

For each group of myths, the original (false) statements and the debunking of the myths will be followed by a structured group discussion. After the completion of the workshop, participants will hopefully have a nuanced view of the relevance of these myths for teaching and learning at Chalmers, and an understanding of suggested replacements for these myths using recommendations from evidence-based research.

##### Relevance for quality of education

Students and teachers have a tacit understanding that the most effective learning and teaching methods will be used in designing a high quality education at Chalmers. Allowing myths rather than evidence-based recommendations to guide choices is not going to provide the best possible educational quality, even though those involved are earnest in their belief in such myths.

##### Workshop activities

For each of the myth groups in the table below, the participants will explore the material in plenum and then small groups according to the following steps:

1. Plenum introduction to the pair of myths in the myth group at hand.
2. Small group discussion of examples where this might be relevant to teaching and learning at Chalmers.
3. Group discussion of what needs to be investigated in order to make an informed choice as to teaching and learning methods that work.
4. Plenum discussion of points 2 and 3 above, followed by a short overview of relevant evidence-based research results.

Points 1-4 will be repeated for each of the three myth groups.

In a concluding small group discussion, participants will be invited to articulate their own standpoints and how they intend to apply the insights they may have gained in the workshop.

Documentation of a summary of discussions and personal standpoints will be collected electronically and anonymously after permission from the participants.

#### Selected groups of myths for this workshop

The following list covers the most important myths which participants will explore during the workshop. Each myth is described and debunked in the book by Bruyckere, Kirschner and Hulshof (2015). The phrasing of the myths as a postulation is used as subchapter headings in this book, and tabulated below for reference, along with the relevant page number in the book. I have also included a keyword phrase for each, and a short note on the debunking of the myth.

Myth keywords	Postulation of myth	Page	Debunking of myth
<i>Myth group 1: Myths about learning styles and quantitative learning pyramids</i>			
Learning styles	People have different styles of learning.	20	People may prefer different ways of learning, but this does not correlate with what works best. No evidence supports the grouping of people in learning styles.
Learning pyramid	The effectiveness of learning can be shown in a pyramid.	28	The even percentages attributed to activities such as 30% retention from demonstration is a tell-tale sign of a myth. Origin not based on sound evidence.
<i>Myth group 2: Myths about discovery and problem-based learning</i>			
Discovery learning	You learn better if you discover things for yourself rather than having them explained to you by others.	48	This is often ineffective, especially for the novice without prior knowledge of the subject matter. Low ability students enjoy it but learn very little. With the right guidance and support the method works better.
Problem-based learning	You can learn effectively through problem-based education.	54	This is not effective for learning new content, but rather for applying previous knowledge.
<i>Myth group 3: Myths about ICT in education and reading of course literature</i>			
Digital natives	Today's digital natives are a new generation who want a new style of education.	139	Neither educational content nor learning methods need be changed for the generation who grew up with the internet.
Reading habits	Young people don't read any more.	149	This is not true, although reading for pleasure is declining.

#### REFERENCE

de Bruyckere, P., Kirschner, P. and Hulshof, C. (2015). *Urban myths about learning and education*. London: Academic Press.



# Urban Myths about Learning and Education

Do they influence students and teachers at Chalmers?

Chalmers KUL Conference on Teaching and Learning  
Sheila Galt 2019-01-09



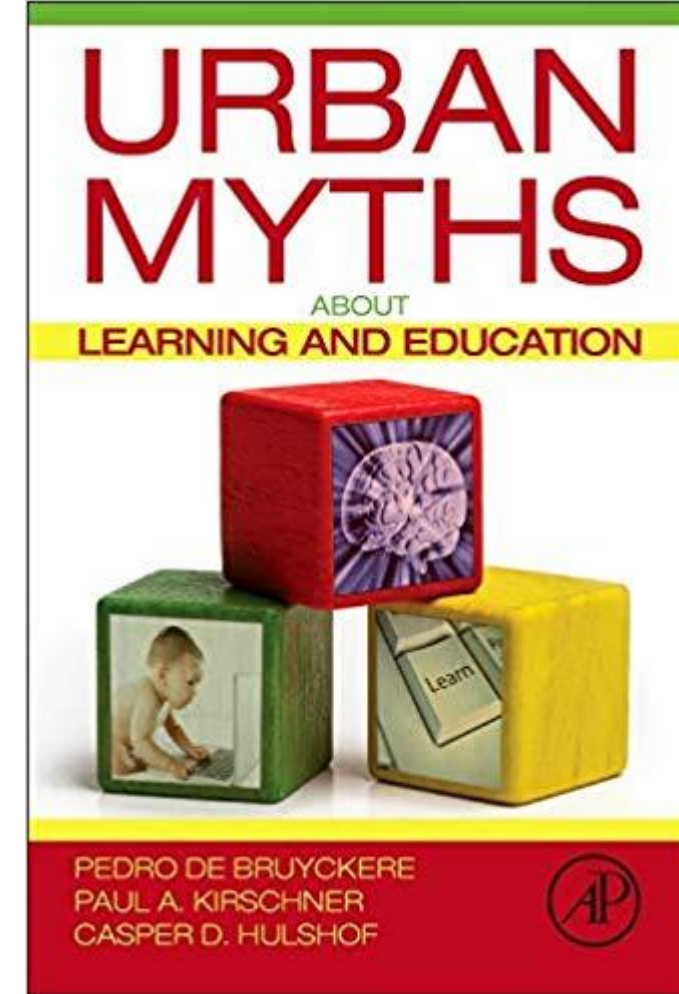


# Workshop Overview

- Intro: Who, What, Why, How
- Example Myth: Learning Styles (plenum)
- 3 groups of 2 urban myths (group discussions)
  - Chalmers relevance
  - Investigations needed
- Replacing busted myths

# Who, What, Why, How ...?

- de Bruyckere, Kirschner and Hulshof,  
Academic Press 2015:  
*Urban Myths about  
Learning and Education*
- Sheila Galt  
*Engineering Education Research (EER)*  
*Communication and Learning in Science (CLS)*
- Workshop participants  
*Please list e-mails to receive workshop documentation.*





# Who, **What**, Why, How ...?

- Urban Myths:
  - Common beliefs
  - Reasonable at first glance
  - Not scientifically sound
- about Learning and Education
  - Study habits
  - Teaching methods
  - Educational design



## Who, What, **Why**, How ...?

- High quality education requires effective learning and teaching methods.
- Myth-based methods don't work!
- Some myth-based methods can even be counterproductive!



# Who, What, Why, **How** ...?

- Example myth
- Group discussion x 3
  - Chalmers relevance
  - Investigations needed
  - Anonymous documentation: Socrative
- Plenum discussion x 3





# Example Myth: Learning Styles





## Example Myth: Learning Styles

- Myth: People have different styles of learning.
- Preferences  
... don't necessarily lead to better learning!
- Categories  
... but people don't fit into distinct groups!
- Personal trait applied to all one's learning situations



# Learning Styles – Categories

- Kolb (1971): Thinker, Doer, Reflector, Decider  
Concrete/Abstract Active/Reflective
- Barbe (1979): Visual, Auditive, Kinesthetic
- Coffield (2004): 71 learning styles listed!



# Problems with Learning Styles

- Different things to be learned, require different learning styles/methods of all learners!
- Examples:
  - V: recognize an ear (visual)
  - A: recall a melody (auditive)
  - K: be able to whistle (kinesthetic)



# Learning Styles Hypothesis

- Crossover interaction assumed:

Type A learn better with Method A  
Type B learn better with Method B

- Meta-analyses, e.g. Clark (1982):

Low correlations  
Weak effect sizes

Reject the hypothesis!



## Example: Learning to write programming code

- Hypothesis:
  - ”Generation method”: writing programming code is better for ”impulsive learners”.
  - ”Completion method”: studying and completing given code is better for ”reflective learners”.
- Results:
  - ”Completion method” best for both types of learners!  
van Merriënboer (1990):



# Learning styles – counterproductive?

- Best methods for learning are replaced by most enjoyed methods.
- Strengths (preferred learning styles) rather than weaknesses are trained.
- Blame the method/teacher/educational system, not the learner, upon failure to learn!



# Learning styles – metaphor

- Preference:
  - Eating style: high salt/fat/sugar
- Method, tailored to preference:
  - Diet: Eat lots of potatoe chips and candy
- Short term results:
  - Enjoyable taste
- Long term results:
  - Poor health





# Learning styles – analogy

- Preference:
  - Learning style: auditive
- Method, tailored to preference:
  - Study: Listen passively and daydream through lectures
- Short term results:
  - Enjoyable thoughts
- Long term results:
  - Poor learning



Healthy learning:  
Skip the "learning styles" hypothesis!

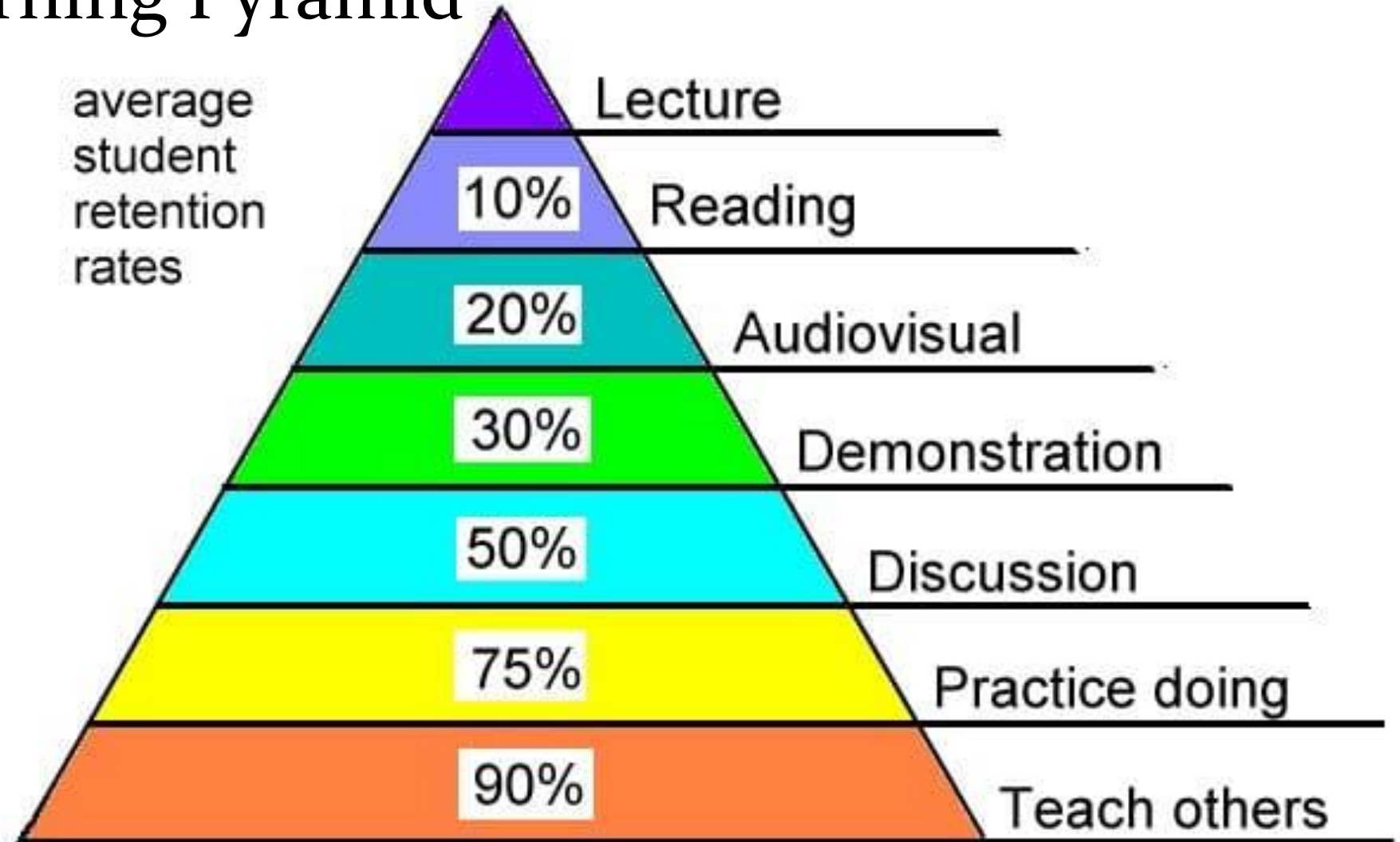




## 3 groups of 2 Urban Myths

- Learning Styles
- Learning Pyramid
- Discovery Learning
- Problem-Based Learning
- Digital Natives
- Reading Habits

# Myth: Learning Pyramid




Source: National Training Laboratories, Bethel, Maine



# Myth: Discovery learning

- Myth:
  - You learn better if you discover things for yourself rather than having them explained to you by others.
- Problems:
  - Often ineffective, especially for the novice without prior knowledge of the subject matter.
  - Low ability students enjoy it but learn very little.
- Requirements:
  - With the right guidance and support the method works better.



## Myth: Problem-based learning

- Myth: You can learn effectively through problem-based education.
- Problem: This is not effective for learning new content.
- Requirements: With the right previous knowledge, this works for training the application of this knowledge.
- Example from learning to solve math problems:
  - Worked-out examples, completion problems or goal-free problems are more effective than conventional problem solving.



## Myth: Digital natives

- Myth: Today's digital natives are a new generation who want a new style of education.
- Terminology:
  - Digital natives: born into the digital world, all ICT natural.
  - Digital immigrants: older, trying to keep up in the digital world.
- Problem: Digital natives still need training in digital skills.
- Requirements: Neither educational content nor learning methods need be changed for the generation who grew up with the internet.



## Myth: Reading habits

- Myth: Young people don't read any more.
- Problem: Replace all written course literature with e.g. video?
- Observations:
  - 2/3 of students read every day for pleasure, but declining.
  - Reading for pleasure correlated with better PISA results.
  - Socioeconomic gap in reading habits is increasing.

PISA (2011): Programme for International Student Assessment





# Workout time!

## Group discussions





# Urban Myth Group Discussion 1

- Learning Styles
- Learning Pyramid
- Relevance to teaching and learning at Chalmers.
- Investigations needed for choosing teaching and learning methods that really work.
- Log in to [www.Socrative.com](http://www.Socrative.com) (Student) in room PHOTON



## Urban Myth Group Discussion 2

- Discovery Learning
- Problem-Based Learning
- Relevance to teaching and learning at Chalmers.
- Investigations needed for choosing teaching and learning methods that really work.
- Log in to [www.Socrative.com](http://www.Socrative.com) (Student) in room PHOTON



## Urban Myth Group Discussion 3

- Digital Natives
- Reading Habits
- Relevance to teaching and learning at Chalmers.
- Investigations needed for choosing teaching and learning methods that really work.
- Log in to [www.Socrative.com](http://www.Socrative.com) (Student) in room PHOTON



## Group discussion documentation

- Socrative comments are appended at the end of this presentation.
- All comments anonymous.
- Please note that group discussion 3 was not included in the actual workshop due to lack of time.



## Replacing busted myths – what really works?

- Small amounts of new material at a time
- Check understanding often to avoid learning errors
- Concrete examples, and storytelling!
- Thinking about, or linking emotions to things to remember
- Variety, surprise, and plenty of breaks
- Extensive, successful, independent practice and regular review
- Feedback – when done “properly”



# References

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Thanks for your participation!  
May the myths be without you!

