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Active learning in Active Learning Classrooms

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Active learning in active learning classrooms

1 Why active learning?
- 1.1 International educational transition
- 1.2 RUG Strategy:
  - Active learning
  - Active learning classrooms (experiment TEO/ZEO 2020-2024)

TEO = Tijdelijke Extra Onderwijsruimtes/Temporary Experimental Classrooms: ZEO = the same at Zernike

2 What is active learning?
- 2.1 lots of meanings and definitions (‘active’; ‘learning’)
- 2.2 active learning is not new

4 Evidence?

5 AL in the active learning classroom

1 Why active learning?

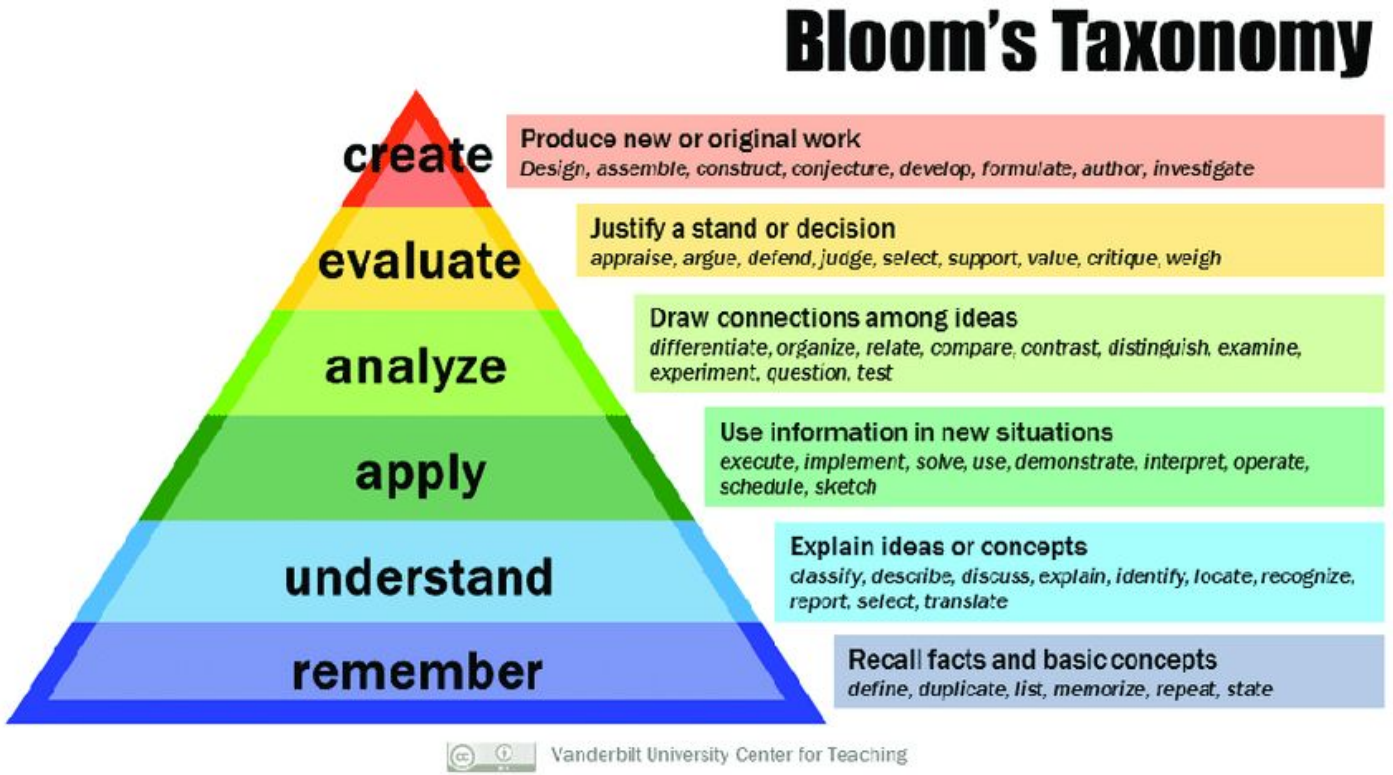
1.1 International educational transition:

traditional lecturing in lecture halls

active learning in active learning classrooms

Evidence that traditional lecturing fails to accomplish academic learning goals

Active learning fits academic learning goals better



1.2 Strategy RUG

- research-driven education
- active learning: "… *promote active participation and collaboration in order to stimulate and facilitate our students to generate, exchange and integrate knowledge*"
- learning aims: "… *impart to our students the values, knowledge and skills that they need to become globally engaged citizens, able to address the contemporary challenges of science and society*"
- in active learning classrooms
  - **Experiment** with Active Learning Spaces that are necessary for active learning, the didactic method supporting the educational vision of the University of Groningen
  - TEO is a Quality Agreement project for 4 years 2020-2024
    (TEO = Temporary Experimental Classrooms; ZEO = TEO at Zernike campus)

Assumption

Active learning allows students to develop higher order thinking skills, the learning aims of higher (academic) education

Questions:

- what concept/definition of active learning do we need to achieve these higher order thinking skills?
- what evidence do we have of the effectiveness of active learning in relation to these learning goals?

2 What is active learning?

Lots of meanings and definitions, depending on

- Definition of ‘active’ (“listening is also ‘active’”, Bonwell & Eisen, 1991)
- Accent on the ‘active’, or the ‘learning’ part (engaging students in the learning process is crucial)
- Definitions focus on the range of activities (from simple: short pauses in a lecture - to complex: using case-studies for decisionmaking skills)
- Definitions that relate activity to the learning process (Freeman, 2014): focus on learning goals (Bloom’s taxonomy)

Concept/definition Active Learning in higher (university) education:

*“The basic premise of active learning involves focusing on reinforcing higher-order thinking skills and instructional techniques, requiring learners to actively participate in the ownership of their learning” (*Shroff, Ting & Lam, 2019*)*

Freeman et al (2014)

"*Active learning engages students in the process of learning through activities and/or discussion in class, as opposed to passively listening to an expert. It emphasizes higher-order thinking skills and often involves group work*"

To sum up the core elements of Active Learning (Brame, 2016):

- activities that students do to construct knowledge and understanding
- that require students to do higher order thinking
- metacognition—students' thinking about their own learning—is an important element
- providing the link between activity and learning

Theoretical background:

- Constructivist learning theory (Piaget): active role of students in building their knowledge, connecting new ideas to old ones, modifying and critically evaluating existing knowledge

- Sociocultural learning theory (Vygotsky): learning takes place in social interaction (group work)

History: active learning is not that new

- your own experiences as a student
- your own experiences as a teacher

- usual in some disciplines (laboratory; studio)

- *new is the evidence* that traditional lecturing and the one-to-all transmission of knowledge does not make our students critical academics who can contribute to the conceptual analysis and problem solving of societal challenges
- But what about the evidence for active learning?

Evidence for active learning?

› strong advocates, but also
› sceptism (what's new?)

Research literature:

- Evidence for the effectiveness of active learning across disciplines
  - (but most studies in physics, biology, engineering, STEM disciplines)
- Improvement of recall of information (Prince, 2004)
- Positive impact on student engagement (Prince, 2004; Freeman et al, 2014)
- Several methodological problems

- Prince (2004): extensive empirical support, but blurred by great variety of what is labelled as ‘active learning’
- Ruiz-Primo et al. (2011): review indicating positive effects, but
  - many relevant active learning outcomes are difficult to measure (e.g. problem-solving)
  - difficult to measure all intended active learning outcomes separately
  - not clear what learning outcomes are measured
  - not clear how significant

Implementing active learning in the classroom

- The active learning classroom

- Three components:
  - Pedagogy/learning goals
  - Space
  - Technology

Active learning in active learning classrooms: “built pedagogy”

- the architecture and the design of the classroom facilitates, allows for certain kinds of learning processes but restricts others

- Active learning classrooms can be considered then as the material expressions of pedagogical views and didactical methods on how to allow students to develop certain learning skills → “built pedagogy”

Active learning in active learning classrooms: “built pedagogy”

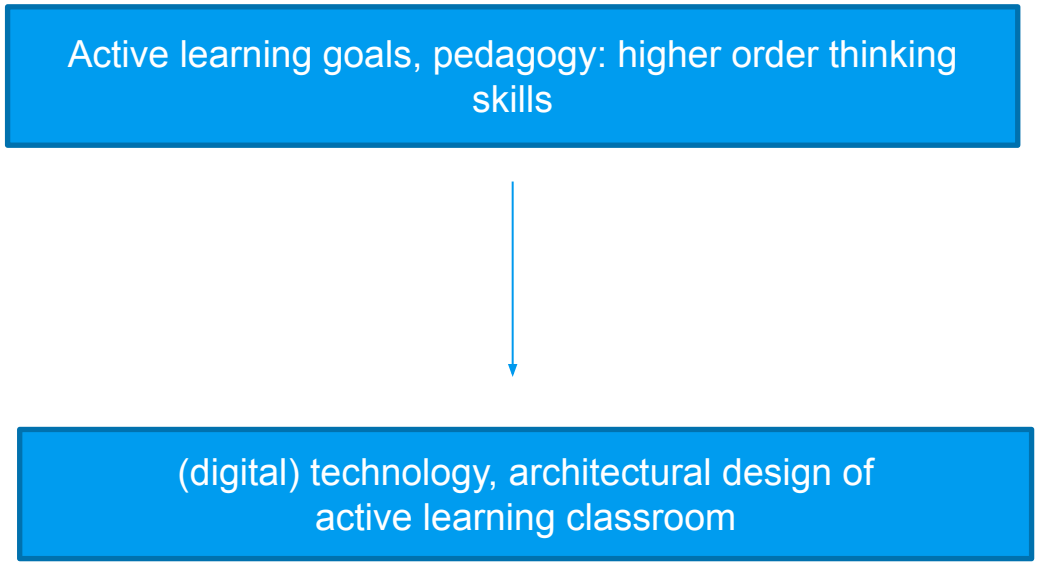
- Where to start?
  - Start from pedagogy?
  - Start from spaces/classrooms

Start from space

- (Digital)technology and architectural design of spaces

- engage students in activities, enhance collaboration, academic performance, etc.

Start from active learning goals

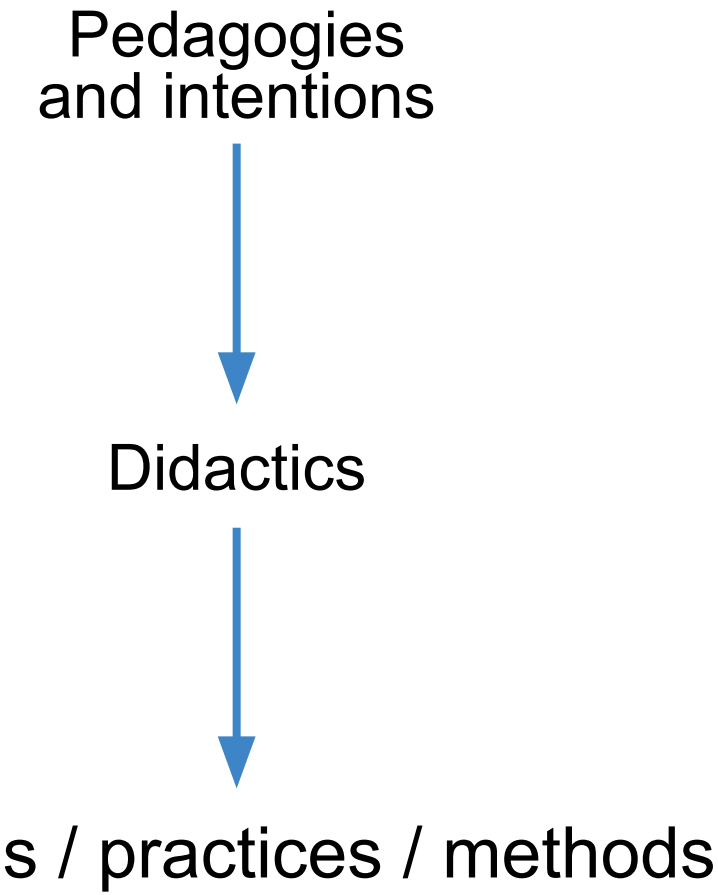


Teaching Strategies to promote Active Learning within an Active Learning Classroom

1. Activities
2. Didactics
3. Pedagogies
4. Practices
5. Intentions
6. Methods

…or a combination of…

Grouping operationalisations of TS in three categories



Pedagogies / intentions

‘How teachers think about their teaching’

Teacher focused vs. *student focused* (Prosser et al., 1994; Byers et al., 2014)

Intended vs. *enacted* (Wright et al., 2019)

Major influence: *beliefs* of teachers (Haines & Maurice-Takerei, 2019; Wright, et al., 2019)

Didactics

Combination of activities

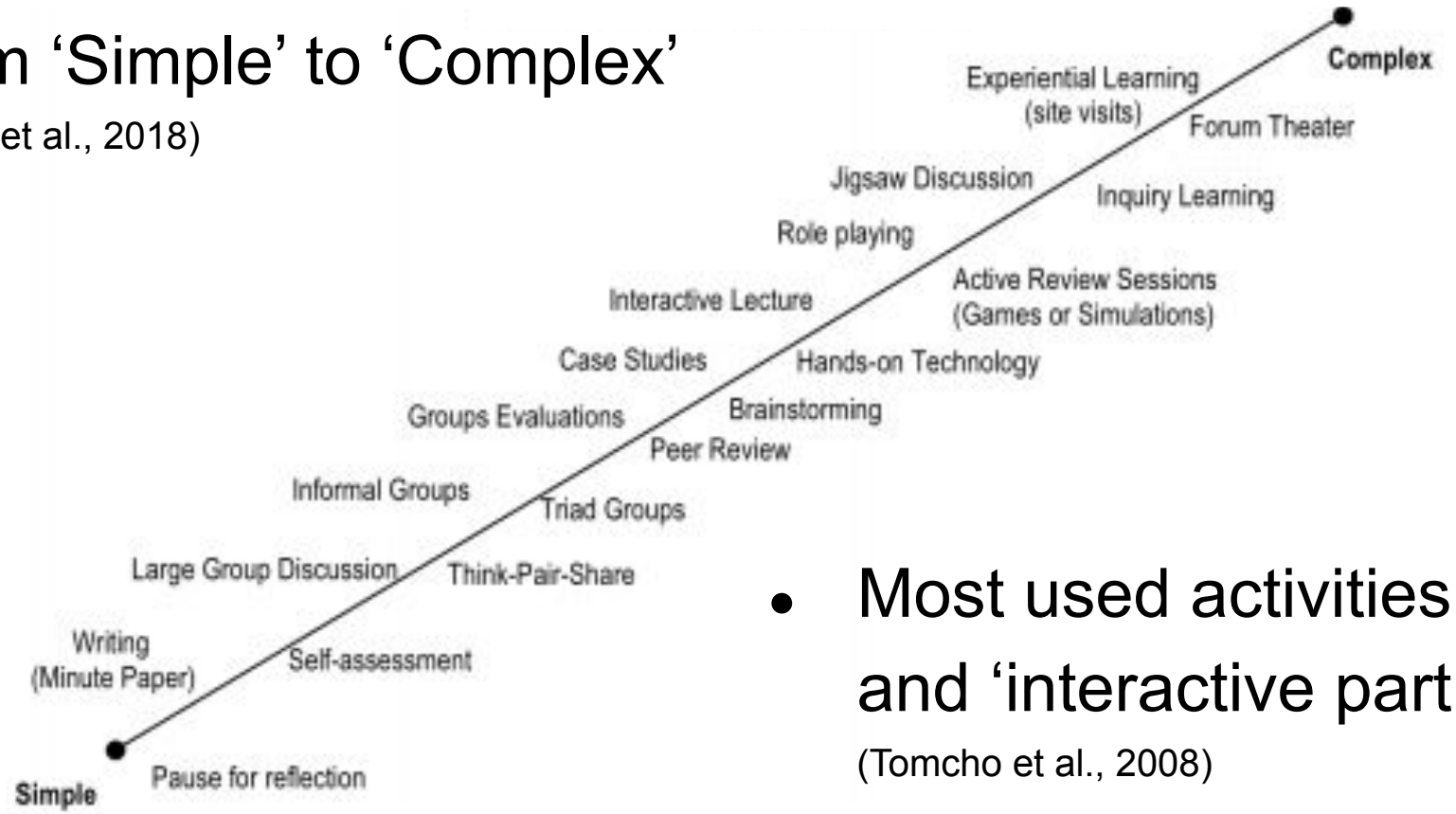
(Hernández de Menéndez et al., 2019; Kay et al., 2019; Santos et al., 2018; Thai et al., 2017; Vokic et al., 2020)

- Inquiry based learning
- Project based learning
- Cooperative based learning
- Problem-based learning
- Team-based learning
- Competence-based learning
- Challenge based learning
- Blended learning
- E-learning
- Flipped Classroom

Activities / practices / methods

From ‘Simple’ to ‘Complex’

(Leong et al., 2018)



- Most used activities in HE: ‘discussions’ and ‘interactive participation’

  (Tomcho et al., 2008)

- Activities facilitated by the ALC?

  (Beery et al., 2012; Handelsman et al., 2007)

Concluding remarks

- Diffuse operationalisations of Teaching Strategies
- Less focus on ‘Pedagogy / Intentions’ instead of ‘Didactics’ & ‘Activities’
- Less focus on ‘Higher Order Thinking Skills’
- Acknowledge beliefs of teachers

Educational ambitions and Active Learning Classrooms

Literature (references & supplementary)

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Thank you for your attention