

A group of five people (three men and two women) are gathered in a lush green field. One person is kneeling on the grass, and a black dog is sniffing the ground nearby. The others are standing and looking at papers or devices. The background features a line of trees under a bright, cloudy sky.

Cultivating the growth of life-science graduates

On the role of educational ecosystems

Inaugural lecture – prof. dr. Perry den Brok, September 20, 2018



WAGENINGEN
UNIVERSITY & RESEARCH

Contents of this inaugural lecture

- The need for new life-science engineers
- The term educational ecosystem
- Drivers for change
- Characteristics of modern educational ecosystems
- Evaluating/researching educational ecosystems
- Existing and future research of the Education and Learning Sciences (ELS) chair group
- Word of thanks

The need for new life-science engineers



Sustainable development goals



Source: <http://www.un.org/en/development/desa/population/theme/sdg/index.shtml>

Grand challenges for Engineering (NAE)

GRAND CHALLENGES FOR ENGINEERING



Make solar energy economical



Provide energy from fusion



Develop carbon sequestration methods



Manage the nitrogen cycle



Provide access to clean water



Restore and improve urban infrastructure



Advance health informatics



Engineer better medicines



Reverse-engineer the brain



Prevent nuclear terror



Secure cyberspace



Enhance virtual reality



Advance personalized learning



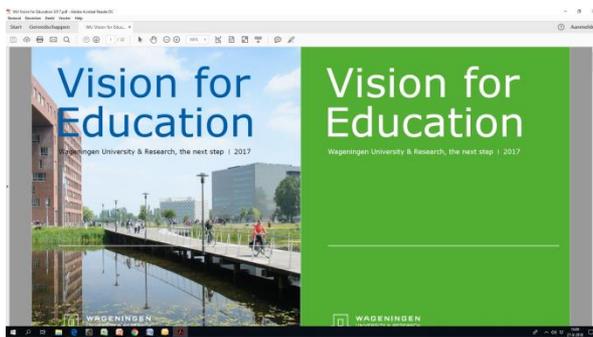
Engineer the tools of scientific discovery



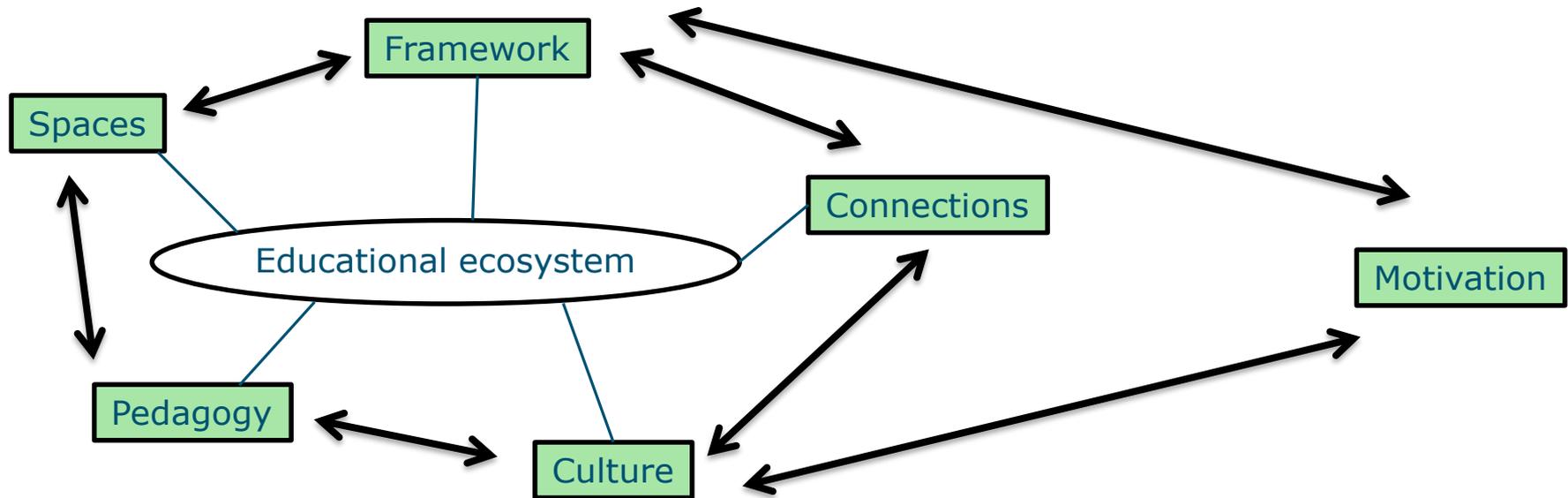
Source: <http://www.engineeringchallenges.org/>

Wageningen educational vision

*"We educate students to become academic professionals, who **can contribute to sustainable solutions** for existing and future complex issues **in the domain of "healthy food and living environment"** all over the world, and who take their **social, personal and ethical responsibilities** seriously. Graduates will need a range of competencies to be successful in our changing world, including **academic, engineering/design, sustainability, social/societal and personal development skills.**"*



Educational ecosystems

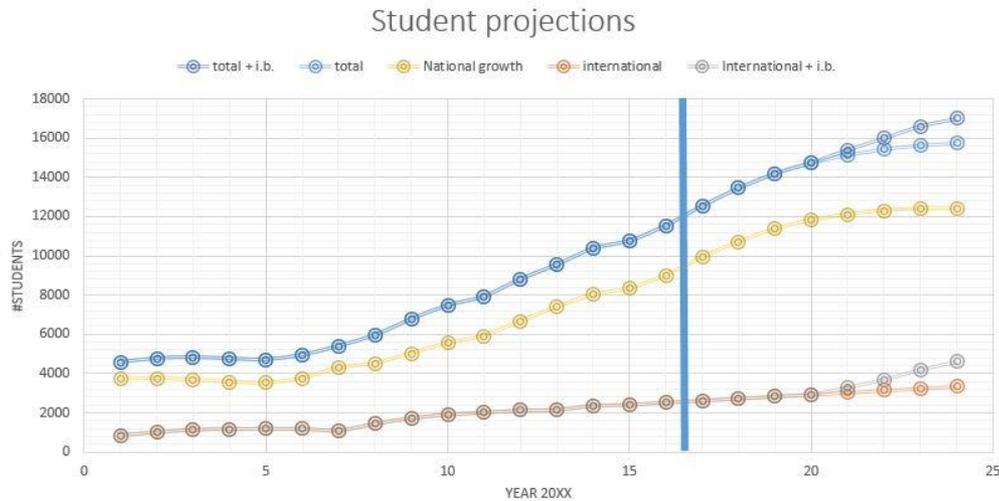


Source: Mueller & Toutain, 2015

Drivers for change - (1) societal need



Drivers for change - (2) change in learners



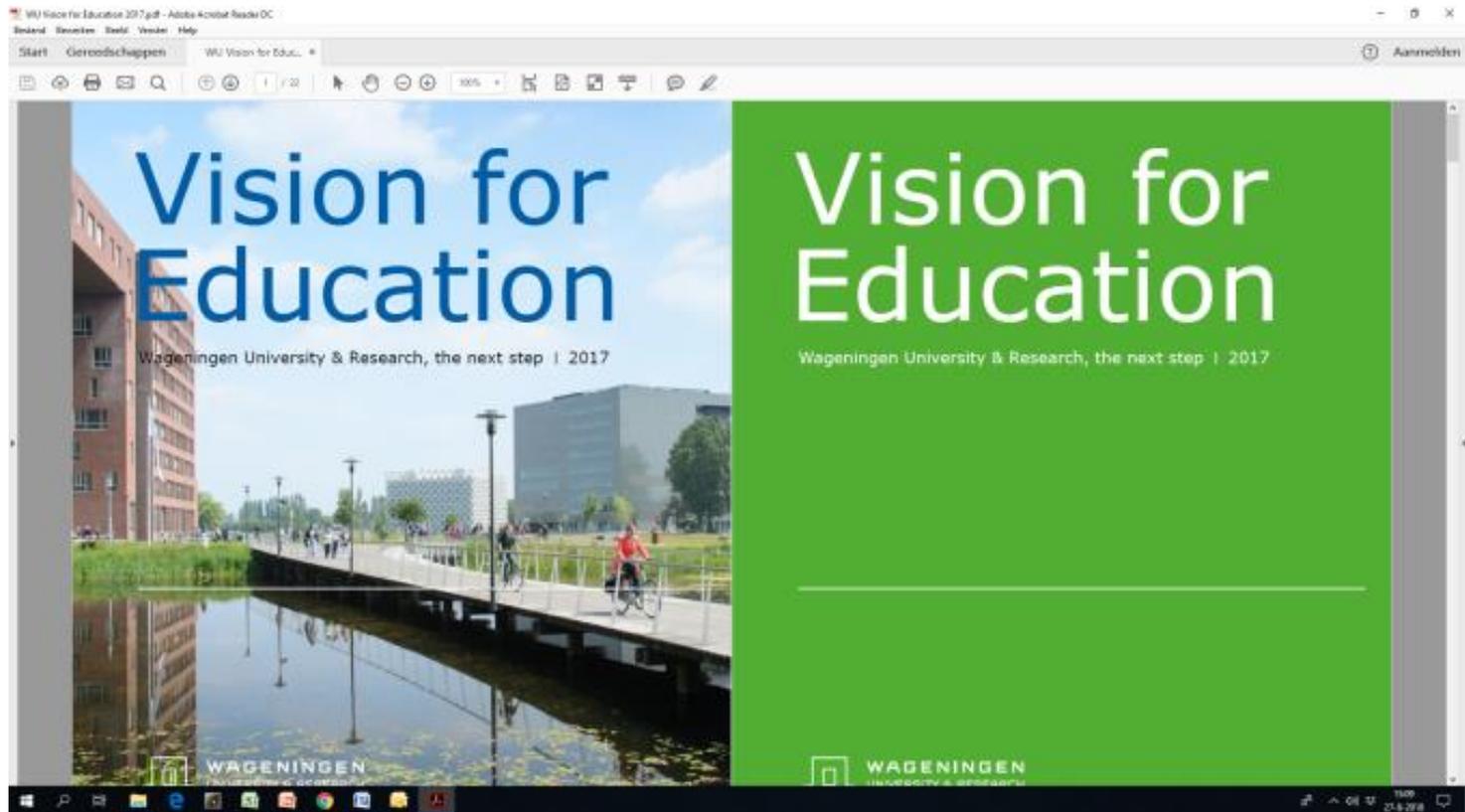
Drivers for change - (3) role of ICT



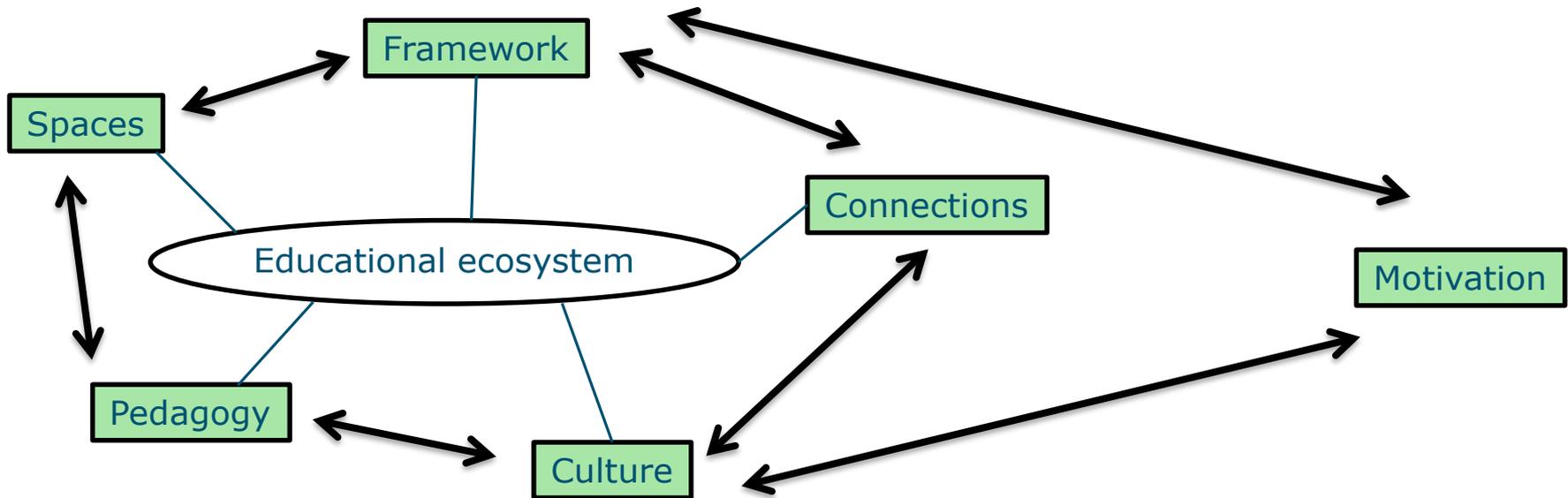
Drivers for change - (4) changes in research



Drivers for change - (5) mission and vision



Characteristics of educational ecosystems



Source: Mueller & Toutain, 2015

Educational ecosystems: structure

1. Focus on complex problems
2. Stimulate professional identity
3. Allow for non-linear processes
4. Allow for formative assessment and feedback

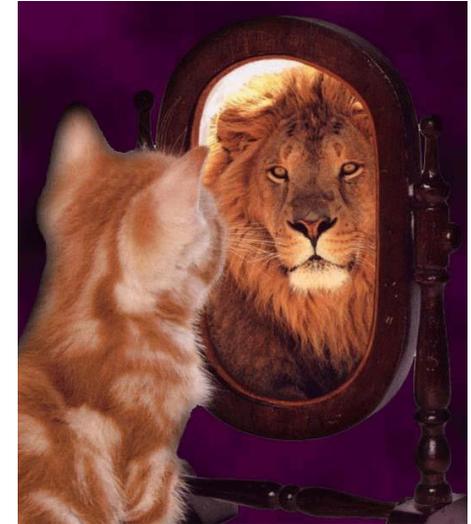
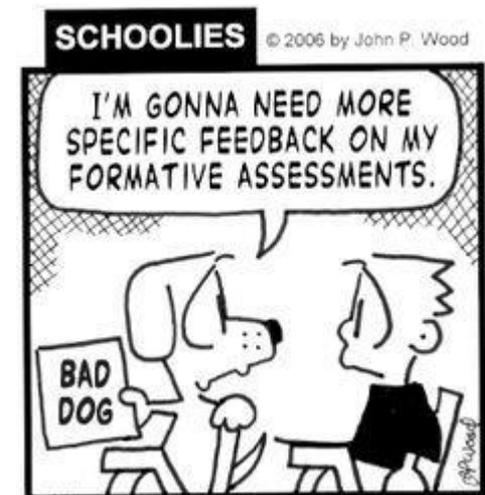


Photo by: Alma Nahualli (wordpress.com)



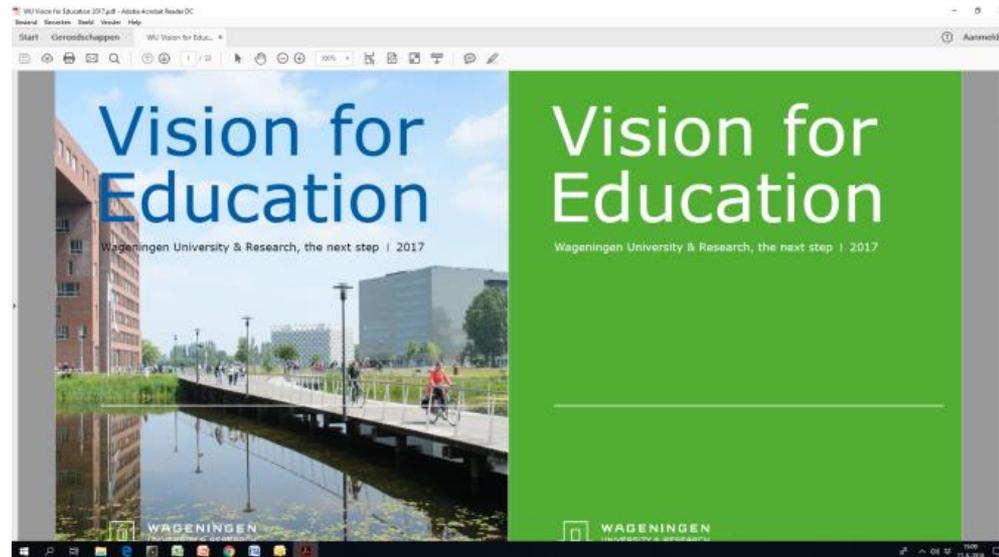
Educational ecosystems: connections

1. Allow for collaboration and co-creation
2. Include multiple practices, domains or cultures (boundary crossing)
3. Interdisciplinarity



Educational ecosystems: culture

1. Focus on mission of WUR: high quality knowledge, rich learning context, flexible and personal learning paths
2. Learning for agency, sustainability, environmental responsibility and emancipation



Educational ecosystems: pedagogy

1. Active learning
2. Experiential and hands-on
3. Metacognitive skills
4. Teachers as coaches
5. Teachers as interdisciplinary guides/assessors
6. Teachers as ICT supporters
7. Teachers as boundary crossers



Educational ecosystems: spaces

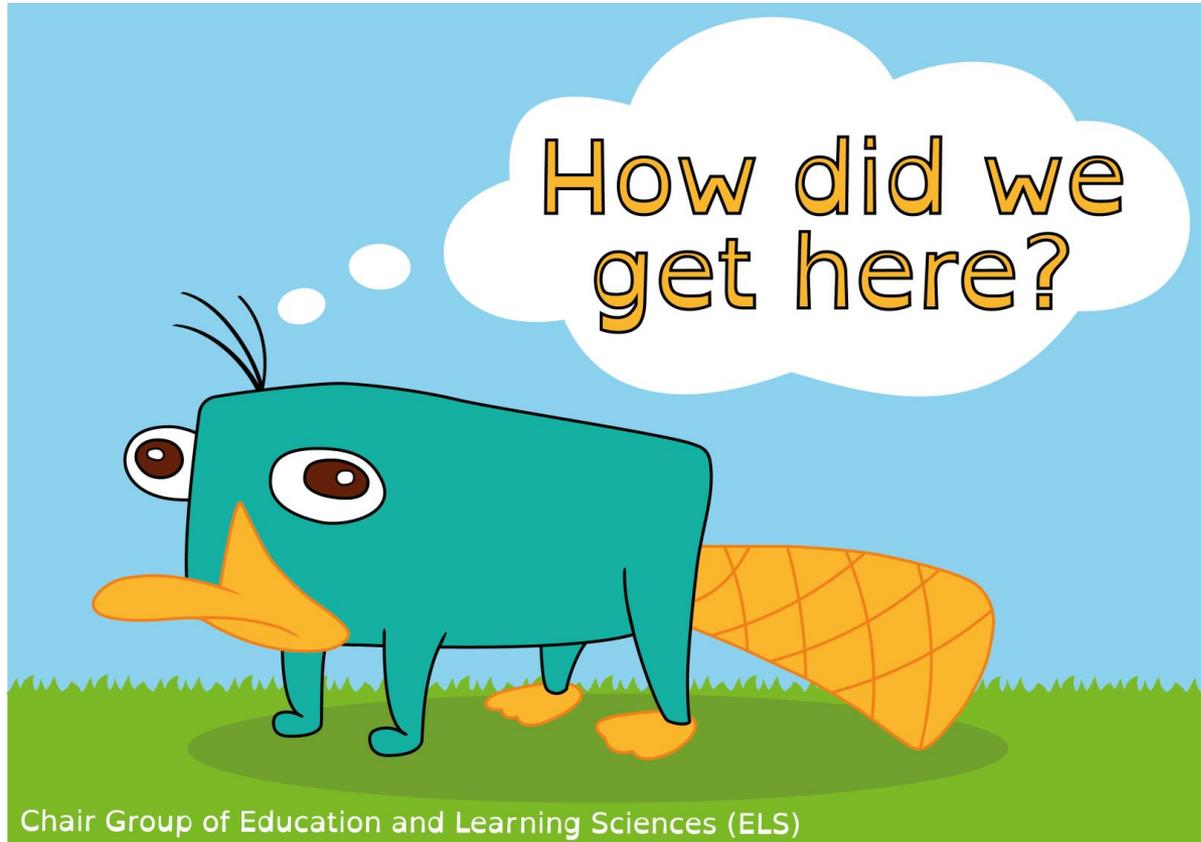
1. Authentic
2. ICT-infused
3. In-'school' and 'out of school'
4. Flexible and open



Evaluating educational ecosystems

- Focus at different levels
- Take into account different timescales
- Common data collection methods, as well as 'new' forms (big data, eye-trackers, physical indicators, etc.)
- Different types of actors may be involved in data collection, analysis and even reporting
- Use of multiple and complex analysis methods
- Link to a variety of criterion/outcome variables
- Include different learning contexts and links between them

Current and future research projects



Picture of 'Perry the platypus' (Phinneas & Pherb) by Nicolette Tauecchio

Examples of recently started projects / themes

- Boundary crossing (Oonk, Gulikers, Tho, Bregt e.a.)
- Complex competencies and their development (Ploum, Lans, Ovbiagbonhia)
- Innovation of education evaluation (Tassone, Runhaar, Biemans e.a.)
- Higher education/WUR as ecosystem (Megawanti, Nameghi, Zelissen)
- Teacher education as innovative domain (Theelen, Adams)

Thank you

- University board and Rector Magnificus
- Management of SSG
- Dean of education & Educational Support Centre
- Martin Mulder, Harm Biemans, Carla Oonk, Jolanda Ruisbroek, Nicolette Tauecchio, Marissa van den Berg, Laura de Wit
- Former colleagues at TU/e and Eindhoven School of Education
- WUR colleagues outside ELS, and co-chairs of the section Business Sciences

Thank you



The Education and Learning Sciences group

A special thank you to...

- My parents, sister and other family
- My friends
- My children (Tim & Bas)
- My wife (Wendy)



Ik heb gezegd!

