Universities in the 21st Century

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What a great challenges ahead!

- The world needs talented people and asks for innovations more than ever
- We have about 22 thousand universities worldwide (webometrics-estimate) and the number is growing: the ‘university model’ has never been so popular
- So how do we, universities, stimulate and develop the quality of university education and research?
Excellence of universities

- Of those 22 thousand universities about 1500 combine education and research (the German 19th century model, further developed in the US): a necessary precondition to safeguard academic excellence
- These universities are known for both employing inspirational academic staff members and organizing and facilitating high-level education
Competition between universities has become intense, leading to:

- Tension between education and research
- Tension between ‘excellence’ and ‘equity’
- But technology can help to overcome these tensions!
How can we promote excellence?

› Through a national Research Excellence Initiative (REI)
› Through the EC-initiatives: for instance in H2020 the European Research Council and the ESF
› For individual universities: try to attract more external money
› But a university itself can also stimulate excellence by internal policy!
What is a REI? (1)

- state-run programmes allocating time-limited (>4 years) funds to research units on a competitive basis
- primary goal: strengthen the international competitiveness of the national research landscape
- strategy: endow few research centres with considerable funds to conduct outstanding research
- selection procedure: multi-level application process based on international peer review, followed by regular evaluations of chosen centres of excellence
What is a REI? (2)

› usually open to all areas and fields of science
› funds for research centres, not individuals
› interdisciplinary / inter-institutional collaboration encouraged
› Centres of excellence can be – clusters of research groups – graduate schools – HEIs as a whole
› universities as regular host institutions for „centres of excellence“
Worldwide excellence policies

› China: 1998 launch of ‘985’ and later on ‘39’
› Singapore: 2002: Global Schoolhouse Strategy
› Germany: 2005: Excellenzinitiative
› Spain: 2009: Campuses of Excellence
› France: 2011: Sorbonne League
› Russia: Project 5:100, 5 universities in the top-100
› Japan: 2013: Super Global Universities
› And more: Finland, Sweden, Norway, Denmark, Poland, Ireland
What can an individual university do?

› Attract and develop talented students and staff members
› Develop international collaboration and spreading academic reputation
› Contribute to grand societal challenges
› Be open in many respects
› I will give some examples on behalf of my home university, the University of Groningen, The Netherlands, and its international networks, such as the Coimbra Group
Remainder of the presentation

› Highlight some of the international academic trends
› Key elements in research policy
› Key elements in education
› The issue of opening the university to the outside world
International trends

> Increased mobility of students and ‘university capital’
> Changing international labour markets
> Demand for international cooperation increases, as is demand for cross-disciplinary research
> ICT-use in education
> ‘Individualization’ of education
> Desire to be ‘open’ in many respects increases
How we stimulate excellent research?

› Hire young talented academics in an attractive career - Tenure Track - model; in Groningen we have a special model for female academics: the *Rosalind Franklin Fellowships*

› Stimulate cross-disciplinary research; offset ‘More-of-me’, focus on societal issues, like in the case of Groningen: healthy aging, energy use, and a sustainable society

› Prepare ‘high-potentials’ for both national and international subsidies and prizes

› Develop an internal talent-development model
Invest in large-scale facilities

> Some examples: (1) proton-therapy facility, (2) IBM-big data infrastructure, (3) co-invest in ESO-projects in Northern Chili

> Use Civic Science: important to use the region as a living lab – we developed a biomedical 3-generations database with 165 thousand people

> In general: we stimulate researchers to ‘produce datasets’ and to open these to the outside world
Collaboration and co-location

- Dutch research is very productive per euro invested
- Dutch researchers have large and strong international collaboration networks
- Evidence shows that the impact of articles is larger if authors work more in each other’s proximity
- This hints at exploring better collaboration options within the university, for instance in cross-disciplinary curiosity-driven and/or societal projects
Stimulating cross-disciplinary research

› By joint-PhD supervision
› By organizing pitches for young researchers
› By organizing sessions for more advanced academics: it is stimulated to talk about issues that are jointly unknown

› See: https://www.youtube.com/watch?v=zk-KYvUW4HY
Education: What we like and acknowledge

- We like to train students that are able to ‘innovate’ in their new environment
- We like *On Campus* education and the concept of learning communities
- We acknowledge heterogeneity of fields
- We like ‘deeper learning’ over ‘surface learning’
- We like students who take responsibility in their own learning trajectory
- We like ‘variety’ of any kind in the student population
Implementing educational policy

- A strategy focused on: (1) learning communities, (2) the International Classroom, (3) flipping the classroom
- Besides there is a desire for research-infused education and career orientation, and
- Separate models of education for talented students: honours programs for about 10% of the student population
Stimulating ‘deeper learning’

› Traditional lectures, with the lecturer ‘broadcasting’ without acknowledging the student mix, have a limited impact on learning

› Students learn more if they are more active in class, can bring in their own input, and feel the owner of their own learning process

› The following slide shows brain activity of a student during a week
Student brain activity
Flipped Classroom

> More preparation and activity before the actual lecture starts

> Just-in-time instructions: video-lectures, collaborative document sharing systems (see NB (Nota Bene) at MIT), pre-class testing

> In class: active individual input, peer instruction, discussions, working on projects, testing
The Flipped Classroom

Teacher

Prepare Reading Assignment (RA)

Push RA to students via web

Complete readings

Respond to assigned questions

Push responses back to teacher via web

Students

Review answers

Plan short lectures

Choose Concept Tests (CT)

Give short lecture

Deliver CT

New Topic

Another CT

or

Review answers

Think individually

Vote

Peer discussion

Revote

2-7 days before class

12h before class

During Class

Just-in-Time Teaching (JiTT)

Peer Instruction (PI)
The International Classroom

1. Taking account of intercultural differences before class starts

2. Making use of the different cultural/international backgrounds of students in class in discussions and problems/cases: let students bring their home examples

3. Preparing for the international labour markets
Learning communities

- Although it is important to take individual responsibility, we like to exploit the fact that students like the Groningen campus
- Both social and educational arguments to form learning communities
- Always a mix of lecturers and students: different forms of communities
Career development

- We stimulate entrepreneurship and the entrepreneurial attitude of students
- We use career intermediation software: Career ConNEXT
- We offer various tools and ask student societies to actively participate
International networks

› Our university is a true believer of the benefits of international cooperation!
› Coimbra Group – active member
› U4: with Ghent (Belgium), Gottingen (Germany) and Uppsala (Sweden)
› Bilateral active partners: e.g. Newcastle, Fudan, USP, Maryland
› And a brand new initiative: University of Groningen Yantai as a branch campus in China
University of Groningen Yantai

> Yantai (1.8 million) is a city in the province Shandong (97 million people)
> Will start in 2017
> Capacity up to 10 thousand students
> Broad range of programmes, PhD-students
> Goal: spread the reputation of the University of Groningen
Impression
Balance between being ‘regional’ and ‘international’ at the same time

> We see ourselves as a ‘window to the international world’ and connect the region to international developments
> We use our region as a ‘living lab’ for international research and education
> We incorporate local companies in international projects and we ask international companies to join the region
The benefits of international networks

› Sharing knowledge and experience
› Offering students help in acquiring foreign experience
› Using ‘trust’ among members in research proposals
› Creating influence through lobbying
› Looking for strategic complementarities
Excellence in Europe - a must for UoG

- ERC is extremely important
- Since 2008 the UoG has obtained 32 Starting Grants, 3 Consolidator, 4 Proof of Concept, and 7 Advanced Grants
- Annual additional budget by the EC has increased to 30 million euro per year
Universities in the 21st century

> Research: curiosity-driven and societal orientation – cross-disciplinary – open – civic science – strong interaction with companies and institutions

> Education: individual active student contributions in class – new ICT – international experience – labour market oriented – unbundled, but with strong campuses

> Societal involved
Concluding: optimism!

› We, universities, bring welfare, both in the short - and in the long run
› We develop the multi-talented young students and researchers
› We safeguard the important academic traditions
› We bring the world to our region
› We determine the future!
Thank you for your attention