Towards the Third Generation University

Persian Gulf University

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J.G. Wissema

Delft University of Technology

www.wissema.com

Main theses

- Universities are subject to a number of developments that are changing them in a fundamental way
- This will lead to a new business model for universities called the 3GU

- The developments will create winners and losers
- Winners will be those universities that adopt the 3GU model

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Development of universities

Three generations university
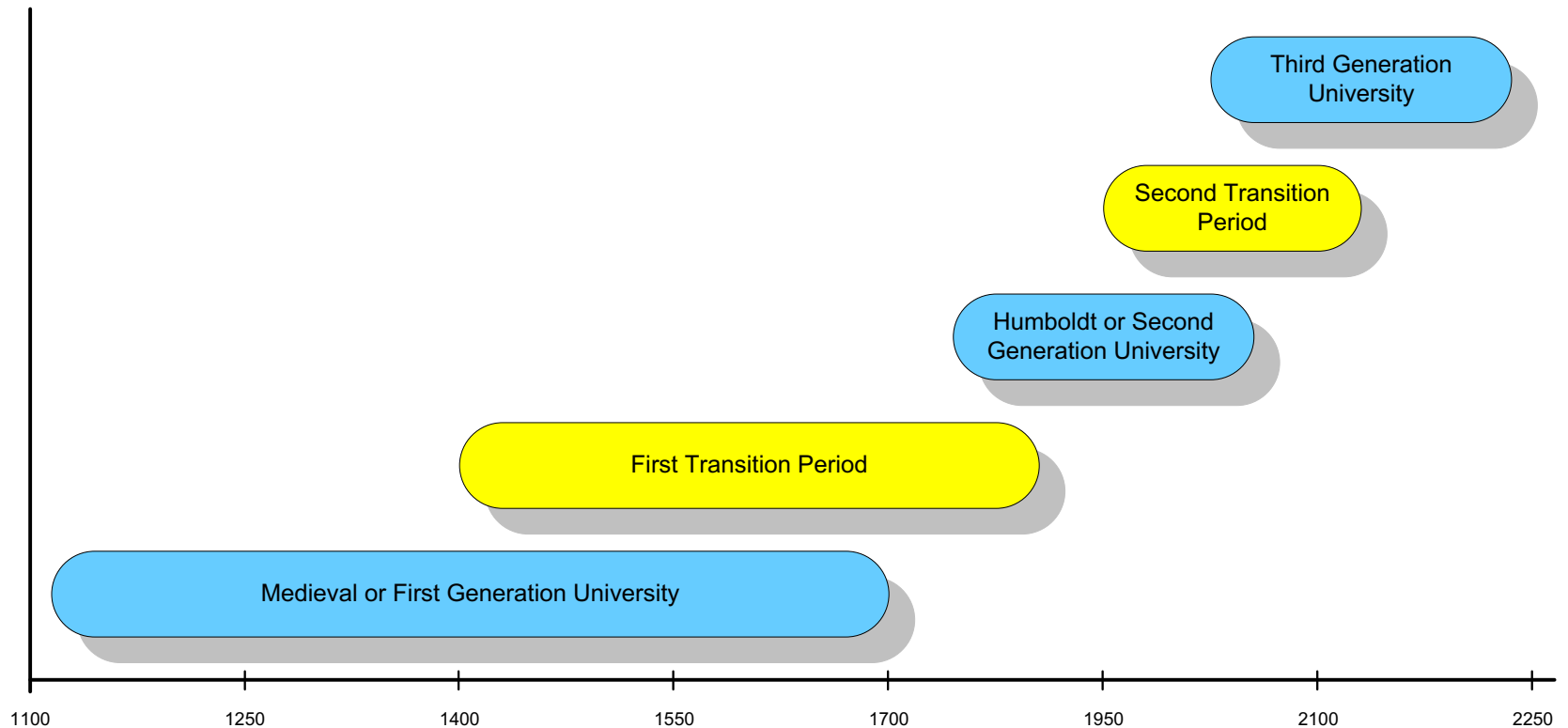
The medieval university (1G)

- First university in Bologna (1158), then Paris (1200); in 1300 there were 20 universities
- Faculties in theology, law, medicine and *artes*
- Loosely organised along individual teachers
- All teaching in Latin → much international studying
- No research as we know it; only education: to create stable theologians and administrators
- Objectives: "enlightenment of the world and stimulation of obedience"

First Transition period
(roughly 1450 – 1815)

- Humanism (1350 – 1550): human dignity first, freedom, value of the personality
- Renaissance: early development of scientific method, experimentation, logical argumentation, transparency
- Book printing
- Discovery of the world
- Reformation
- Enlightenment in the 18th century
- New developments in research emerged outside the universities

Second Generation: Wilhelm von Humboldt

- Prussian diplomat and minister of education; linguist and philosopher of the enlightenment
- Established the University of Berlin as a role model
- Based on the ideals of Renaissance and the Enlightenment movement, the 2G university brought the modern scientific method to perfection

Characteristics Humboldt university (2GU)

- Research is the main task and education is integrated with it (master – fellow– apprentice)

- Elite university (intellectually and otherwise)

- Based on rationality, observation and transparency

- Research is mono-disciplinary. Increase of disciplines and ever further sub-specialisation

- University becomes nationalistic; Latin disappears as lingua franca; inter-university mobility is hampered

Developments that induce the Second Transition Period

1. Explosion of student's numbers → mass education and management problems
2. Exploding cost of cutting edge research → universities have to look for alternative funding
3. Technology-driven enterprises discontinue fundamental R&D (but still have a need for it)
4. Globalisation leads to three kinds of competition
5. Governments want universities to play a role in the knowledge economy
6. Rise of interdisciplinary research

New challenges in the 1990s

- Universities become cradles of new, technology-based, economic activity, especially in IT industry and life sciences

- IT is developed through technostarters → support for technostarters

- Universities become regarded as an element of the National Innovation System

- Corporations open up their R&D activities, which creates exiting possibilities for collaboration

- Partly because of these trends, partly because of the need of generating more income, universities start systematic know how exploitation
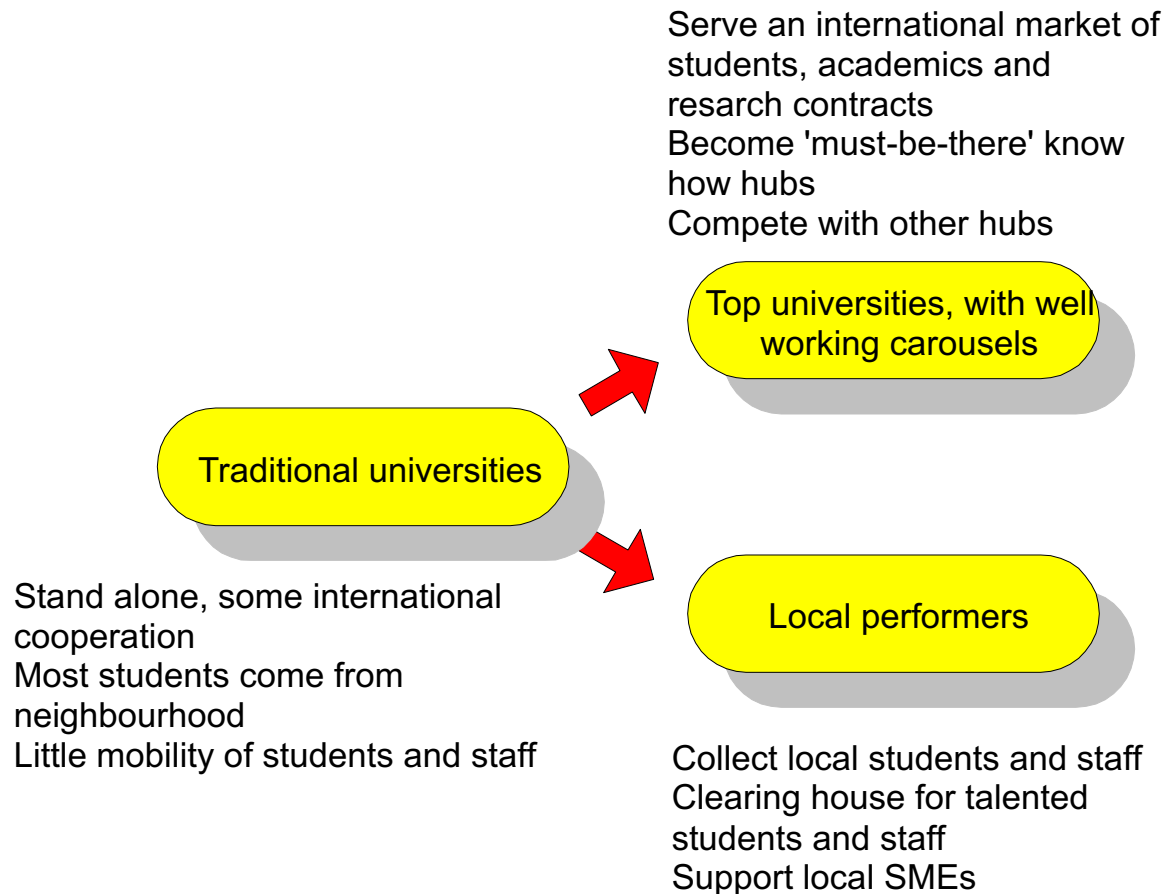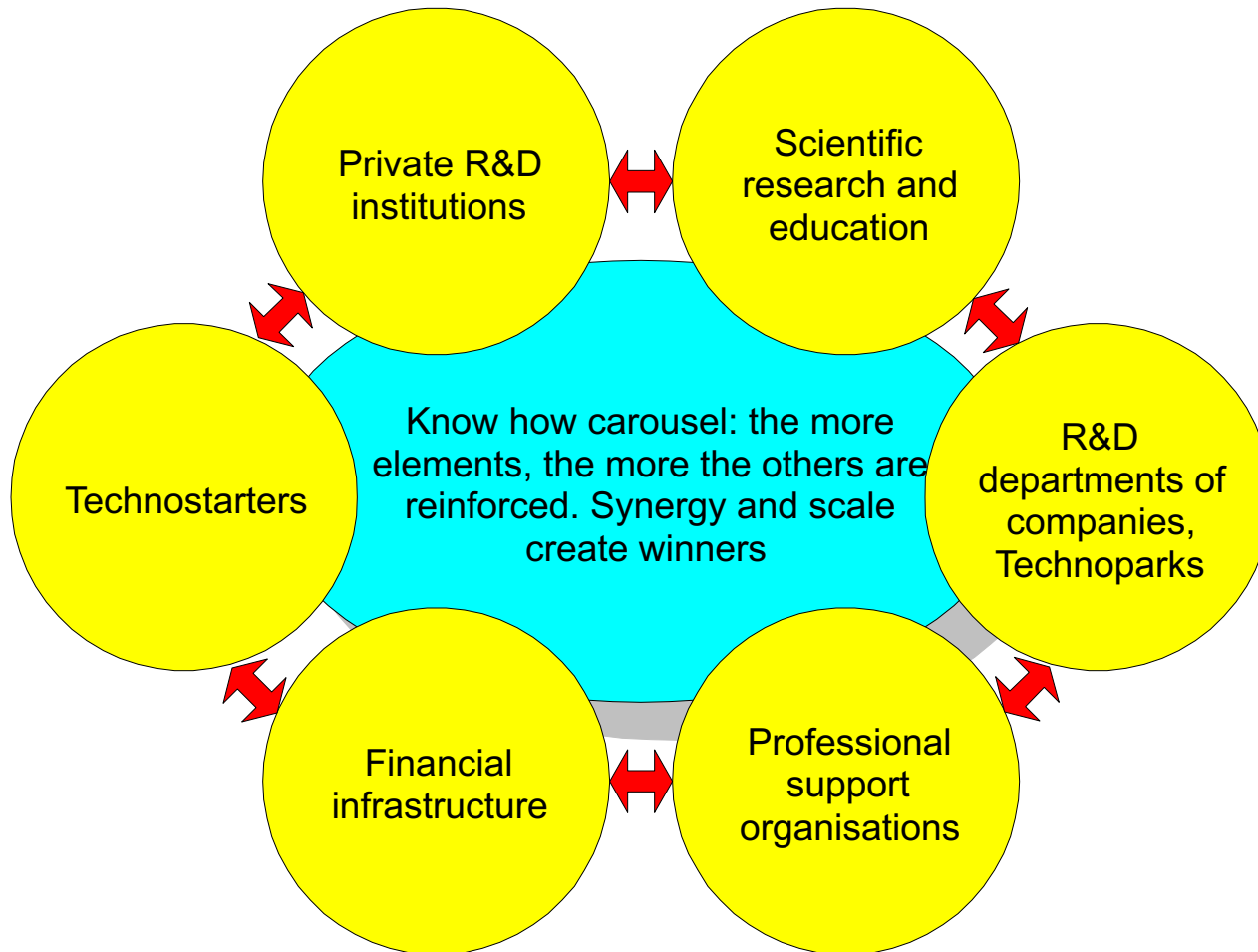
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Third Generation University

The Cambridge Phenomenon

- In 1960: few commercial activities around the university

- Now 3000 high tech firms with direct employment of 60 000

- Development largely due to private initiative and initiatives of Colleges

- After 1996 university seeks cooperation with industry

- After 1997: government funds for commercialisation

- Business School in 1990, Centre for Entrepreneurship in 2003

- Many groups of business angels and professional service firms and other private initiative

- Still largest number of Nobel Laureates (72)

Competition leads to two kinds of universities

Serve an international market of students, academics and resarch contracts
Become 'must-be-there' know how hubs
Compete with other hubs

Top universities, with well working carousels

Traditional universities

Stand alone, some international cooperation
Most students come from neighbourhood
Little mobility of students and staff

Local performers

Collect local students and staff
Clearing house for talented students and staff
Support local SMEs

Emerging: The 3rd generation university and the know how carousel

Private R&D institutions

Scientific research and education

Technostarters

Know how carousel: the more elements, the more the others are reinforced. Synergy and scale create winners

R&D departments of companies, Technoparks

Financial infrastructure

Professional support organisations

Contours 3rd Generation University

1. The basis is fundamental research - still

2. Research is mainly transdisciplinary research carried out in Institutes, managed by academics

3. In research, education and commercialisation of know-how there is considerable cooperation with industry (technology-based enterprises, production firms, start-ups). The 3 GU is an open university: via know how carousel and including an academic hospital

4. International competition for students, academics and corporate research contracts

5. Two-tier university: mass university with special arrangements for the best and brightest (staff and students)

Contours 3rd GU continued

6. Recovery of academic creativity. Central role for the Design Faculty
7. Cosmopolitan university with English as *lingua franca*
8. Know-how exploitation becomes the third objective with a range of specific instruments including a 4th member of the Board of Management. Know how exploitation or service to society will be integrated with research and education

Summary

	Characteristics of the:		
	First Generation University	*Second Generation University*	*Third Generation University*
objective	education	dito, plus research	dito, plus know how exploitation
role	defending the truth	discovering nature	creating value
method	scholastic	modern science, monodisciplinary	same, interdisciplinary
creating	professionals	dito, plus scientists	dito, plus entrepreneurs
orientation	universal	national	global
language	Latin	national languages	English
organisation	nationes, faculties, colleges	faculties	University Institutes
management	chancellor	(part time) academics	professional management

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Technostarters and why universities should support them

Who are the technostarters?

- *Technostarters are students or staff members who establish their own technology based firm*
- They are people with initiative who are willing to take full responsibility of their own life and work
- Technostarters are learners and good organisers
- Most technostarters do not want to work for a boss …..
- ….but some see the start-up as a career opportunity as industry needs entrepreneurs, not managers
- It does not take a special gene. Every student or staff member can become an entrepreneur

Why do people do it?

- I want to take responsibility for my own future (53%)

- I relish the challenge of going it alone (52%)

- I want to be my own boss (48%)

- I have a unique idea (43%)

- I want to make more money (28%)

- I am unhappy in my job (19%)

- I want flexible working hours (8%)

- I am unemployed (6%)

Source: Shell LiveWIRE Entrepreneur of the Year Award Finalists Report 2004

Role of the technostarters

High technology companies are both an important part of our world's economic growth as well as the place where many young entrepreneurs realise their dreams

John L. Hennesy, President of Stanford University and (co-)founder of high tech firms

Bank Boston Report

- In 1997 there were 4000 MIT-related companies (located world wide)
- These employed 1.1 million people
- Annual world sales of $232 billion
- That is roughly equal to a gross domestic product of $116 billion, which is comparable to the 1996 GDP of South Africa or Thailand
- MIT also "imports" entrepreneurs as many companies were not spin-outs of the university but rather company founders who came to Massachusetts to benefit from the presence of MIT
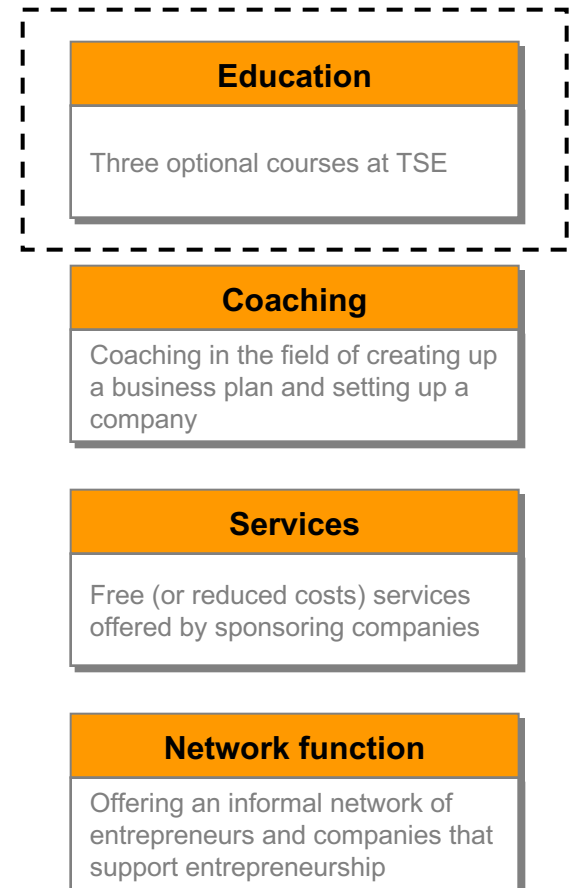
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Teaching entrepreneurship

Creating the flow of support: Professional support by sponsors

Foundation "Network Young Entrepreneurship"

Activities

Delft University of Technology

Section Technology, Strategy & Entrepreneurship

Sponsoring Companies

Roland Berger Strategy Consultants

Business plan / strategy

Ξℓ ERNST & YOUNG

Financial administration, fiscal affairs

ARNOLD SIEDSMA

Intellectual Properties

HOLLAND VAN GIJZEN ADVOCATEN EN NOTARISSEN

Legal Advise

Rabobank

Investments

BENNIS PORTER NOVELLI COMMUNICATIE ADVIESBUREAU

Marketing and Communication

Friends

Alumni

Wissema Consulting Ltd

Education

Three optional courses at TSE

Coaching

Coaching in the field of creating up a business plan and setting up a company

Services

Free (or reduced costs) services offered by sponsoring companies

Network function

Offering an informal network of entrepreneurs and companies that support entrepreneurship

Our course for real starters

- The curriculum follows the chapters of the business plan. We start with the business concept and then work along the chapters of market research, marketing, manufacturing, financial forecasting, financing, corporate and IPR legal matters etc
- The lectures are given by practitioners; they also assess the corresponding chapters of the business plan
- End term is the quality of the business plan, no exams!

The cascade model
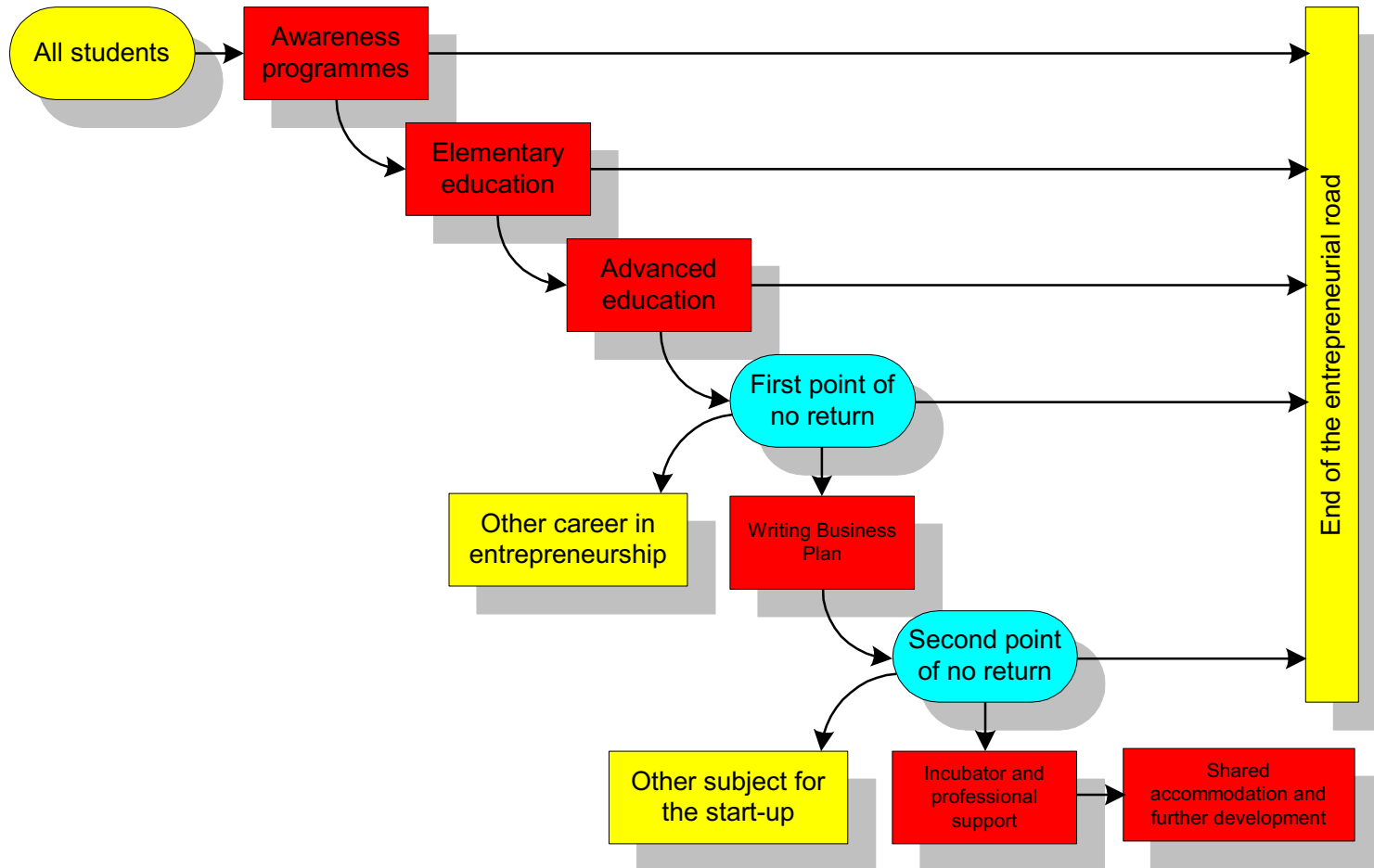
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The new learning

Learning

- Learning and teaching have remained essentially the same during the past millennia: "The sage on the stage" and the pupils making notes

- This is changing rapidly and we can identify three stages of learning / teaching

- These approaches to learning coincide, not surprisingly, to the three generations of universities

- But you don't have to be a 3GU to apply them – schools do

- Let's go through the stages

Stage 1: Classical learning

- Direct interaction between teacher and students or small groups of students

- Some of the lectures are interactive, others are monologues

- There can be exercises: dissection tables, labs, field research in botany

- It was practiced in antiquity and the Middle Ages and it still comprises a good part of our learning system, especially in post-graduate courses

Stage 2: Industrial learning

- With the Industrial Revolution came the need for mass education

- The six principles of industrial society were applied to education:

  1. Specialisation: the higher up the teaching ladder, the more specialised the courses

  2. Standardisation: courses, diplomas, students and teachers became standardised. Choice of a university became irrelevant

  3. Synchronisation: Education connects seamless to work with the diploma being the 'linking pin'. Diplomas are the communication tool between graduates and employers

Industrial learning cont'nd

4. <u>Concentration</u>: schools and universities became ever larger until they have become true learning factories; exams have become likewise industrialised

5. <u>Maximisation</u>: Output of schools and institutes of higher learning was maximised, quantity as well as quality. Enter all kinds of (quality) measurement. Universities boast of their high 'production' of scientific papers, just like a car manufacturer boasts about the number of card produced

6. <u>Centralisation</u>: In just about every country, the Ministry of Education sits at the top of the National Education System

Disrupting trends – at the 'supply-side'

1. Results of pedagogical research. Challenges:
   a. Why year classes, rather than multi-age groups?
   b. Why should a student be forced to repeat a year – and waste time and motivation - if only some subjects are below standard?
   c. Why should pupils and students follow standard programmes? After all, neither students nor jobs are standard?
   d. So, the trend is towards self-study, learning in small groups and individual tutoring

'Phenomenon-based learning' - Finland

2. 'Phenomenon-based learning = students work on a project, either alone or in a team. Finland is building a completely new set of schools:

   a) Classrooms with benches are replaced by 'lounge-like islands'

   b) 'Classes' with pupils of different age are smaller than 19 students

   c) There are neither school inspectors nor teacher evaluations (an ombudsperson comes instead), school days are short and summer breaks lasts ten weeks

   d) Students are being assessed by their teachers; there are no exams other than for those who want to continue learning, more of an entrance exam in fact

'Supply-side' trends cont'nd

3. Embedded' learning, getting assignments in industry or other employers while still at school or university.

4. Teachers still matter. A study of the University of Melbourne found that 'teacher expertise' is the most effective way in learning

5. Internet already has a vast impact. The popularity of MOOCs, a rather primitive way of learning, has taken great flight. On-line learning has great potential and this will be augmented by:

6. Artificial intelligence - still in its infancy but it holds vast promises

7. Brain research

1. New tools such as Neuropixels, a probe, 1 cm long and 70 microns across, is inserted into the brain and can read signals from groups of brain cells.

2. Much efforts go into the design of brain-computer interfaces, allowing persons with artificial limbs to move them by the power of thought, just like we do naturally

3. We know now that intellectual exercise, like learning a new language, is 'training' the brain like one can train a muscle

'Demand-side' trends - students

- New generations demand different work.

- Millennials seek challenges more than money, they want to work for a coach, not a boss, they want to substitute the annual job evaluation for ongoing discussion in which attention is given to strengths, not weaknesses

- Status does not interest them, many don't own a car. Millennials are twice as likely to invest in so-called responsible companies and are twice as likely to exit investments because of objectionable corporate activity as the average investor

'Demand-side' trends - employers

- Already for many years, HR practitioners advocate focus on human development. Instead of standard employees, employers need 'made-to-measure' personalities

- This means that the output exams and diplomas rapidly lose their significance. The current, bureaucratic procedures are being replaced by negotiations in which the employer brings in 'honest' job descriptions while the potential employee delivers a 'pitch' illuminating what he or she stands for, what educational pattern she has taken and what she is looking for

'Demand-side' trends - employers

- Finally, there is opposition against the notion that learning is just a matter of cost/benefit analysis.

- Courses are not only a purely financial investment. "Studying at universities should be a unique and transformational experience, challenge your principles, take you out of your comfort zone"

Elements of the New Learning

1. "No lectures, no classrooms, no majors, no departments" – Christine Ortiz at MIT. "Rise of the challenge-driven university" rather than coercion-driven education – Geoff Mulgan

2. Teaching becomes a succession of team-projects and individual learning projects with increasing complexity ('levels', as in games)

3. Students will choose such courses by matching their chances in the job market with their interests. They might take quite unorthodox combinations, such as mixing Mandarin and philosophy with a course in physics

4. Contacts with all kinds of employers start at day one

Elements of the New Learning cont'nd

5. Teachers become coaches rather than orators. Teaching becomes a high-standard profession

6. Institutes of Advanced Learning at major universities

7. Students learn to pitch what they have learned and what they seek in employment

8. End of overspecialisation – knowing more and more about less and less – A.D. Lindsay of Oxford

9. Students are in charge of education, not the 'system'. This means a devolution of the National Education System; let students and teachers decide what and how to learn, top-down design of courses is contra-productive

Elements of the New Learning cont'nd

10. Output exams and diplomas become just a festive celebration of the completion of an education.

11. The emphasis shifts to input exams. The world's top universities already apply this, requiring not only a good school diploma but engaging in a series of interviews with potential students

12. Back to education as a transformational experience. Students will be encouraged to engage in all kinds of social activities, urged to do so by potential employers

Questions or comments?

If you are interested in reading additional information on the topic of the 3GU, you can scan the QR-code and go to my Facebook page, where I regularly post information.