Technology Dynamics MOT1412

Lecture II
September 2022

Dr. Claudia Werker

Lecture I: catching up

Getting to know each other

0. Resp. innovation and the 4th Industrial Revolution

Course Overview

1. Innovation: Concept and measurement

Introduction to (blended) learning and assessment

Introduction of exercises for groups work this afternoon

Forming groups

LEARNING: Please use Brightspace for all information on MOT1412 Technology Dynamics! https://brightspace.tudelft.nl/

Important files

1. **schedule**
2. **reader**
3. **groups‘ work including exercises**
4. slides
5. possibly additional material

Introduction to blended learning

Chapters of reader:

- text
- reading lists
- links to videos

Extra-file with exercises

Important!

You will have to increasingly prepare the lectures in advance!

We will use the lecturing time for answering questions.

Introduction to the assessment I

Important!

The two trial exam (writing and assessment) are compulsory.

You can only take the exam if you at least

- **tried to answer every question including some indication if you cannot do so in both trial exams**
- **completely assess the trial exam of one fellow student for both trial exams**
- **upload both on time on Brightspace**

Introduction to the assessment II

- Compulsary trial exams on
  - October 3rd, 2022, and on
  - October 24th, 2022

  can be done online but it is the responsibility of the students to upload the files (answers and assessment) in time on the respective day
- Exam on November 7th, 2022
- Resit on January 23rd, 2023 (preceded by a trial exam t.b.a.)

Exercises on the trial exams provide an indication of how the exam will look like.

Lecture I

Getting to know each other

0. Resp. innovation and the 4th Industrial Revolution

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Introduction to the groups‘ work this afternoon I

- Groups‘ work on campus (supervised)
- Take-away groups‘ work (self-organized)
- Tasks for individual follow-up (independent)

Introduction to the groups‘ work this afternoon II

5 ECTS = 120-150 hours/ten weeks (Q1)

12.5-15 hours/week

3 hours of lecturing and on-campus groups‘ work + 1.5h self-organized groups work = 4.5 hours/week

8-10.5 hours for individual follow-up

Introduction to the groups‘ work this afternoon III

Please

- open https://brightspace.tudelft.nl
- go to MOT1412 2022-2023 Q1 - content – exercises
- open the file MOT1412 Technology Dynamics Groups Work including Exercises

- Go to **Week of September 12th, 2022**:
  - Groups‘ Work directly after the lecture
  - Take-away groups‘ work
  - Tasks for individual follow-up

Skill: Citing, quoting, paraphrasing and summarizing sources

Basics: short and full citation

short: * Balconi, Brusoni & Orsegnio, 2010 or
* Balconi et al., 2010

long: Balconi, M., Brusoni, S., & Orsenigo, L. (2010). In defence of the linear model: An essay. Research Policy, 39(1), 1-13. http://dx.doi.org/10.1016/j.respol.2009.09.013

Advanced: quote, paraphrase and summarize appropriately

- quote when words are particularly original
- paraphrase when you state more clearly in your own words
- summarize when details are irrelevant

Follow-up Exercises Chapter 1

1. How did the groups‘ work and the take-away groups‘ work function?
2. How did you manage the individual tasks?

3. What did you learn
   a) content-wise
   b) skill-wise

from

- the webpage of European Innovation Scoreboard 2021 and
- paper by Edquist et al. 2018?

Groups' Work: Summary of discussion 1f

"Countries from different regions show a striking difference in the profile of their strengths and weaknesses. France and the Netherlands in Western Europe have very strong education and research systems, though punch below their weight in development of ICT infrastructure and SME development. By contrast, in Eastern Europe (Hungary, Slovakia, Lithuania), the level of education is comparatively rather high, though the effective innovation output seems to be lower. Performance within countries depends heavily on the indicators one focuses on. We chose to focus on the sustainability indicators for our ranking, and found the Netherlands to be the highest performer, compared to the lowest performer, Hungary. We found the relevance of indicators to vary drastically - some indicators are clearly relevant to innovation system performance, while others are opaque or only indirectly related to innovation-system performance." (Group 1)

Lecture II

2. Innovation Systems and Proximity

2.1 The Linear Model of Innovation (B/F+)

2.2 Defining Innovation Systems (TL)

2.3 Agents and Stakeholders (TL)

2.4 Proximity (TL)

B/F blended learning/flipped classroom

B/F+ introduced by the professor

TL traditional lecture

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2.1 The Linear Model of Innovation
(blended learning/flipped classroom +)

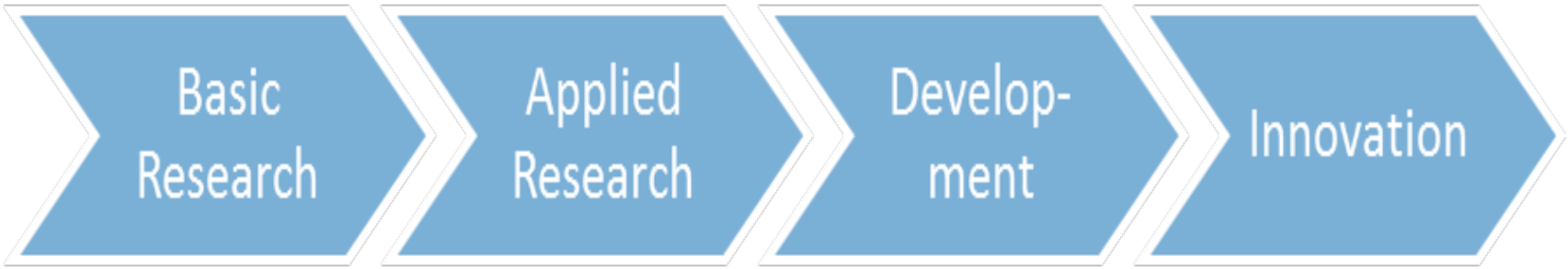

Figure 1: The linear model of innovation inspired by Godin (2006)

2.1 The Linear Model of Innovation

Please explain the muddiest point you identified!

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2.2 Defining Innovation Systems

- Institutions
  - Formal (e.g. written laws)
  - Informal (e.g. codes of conduct)
- Innovative agents from industry, government, universities, public and private research agencies
- Relationships between innovative agents

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2.3 Agents and Stakeholders: Differences I

Agents versus other stakeholders:

- agents can act and influence
- other stakeholders are subject to changes

2.3 Agents and Stakeholders: Differences II

Agents: who takes the lead?

- Industry, in particular firms
- Government, in particular via specific policy fields (e.g. military sector, health)
- Universities:
  - research, teaching and valorisation
  - basic and applied research

2.3 Agents and stakeholders: types

2.3.1 Academic agents & stakeholders: mainly universities

2.3.2 Industrial agents & stakeholders, i.e. companies

2.3.3 Governmental agents & stakeholders: e.g. city councils, ministries

2.3.1 Universities: Basic Research and Beyond

1. The mission of universities
2. Universities as regional knowledge providers
3. Universities' potential to foster and generate human capital and entrepreneurship
4. Universities as nodes of intra- and inter-regional linkages
5. Regional outcomes of universities' relationships

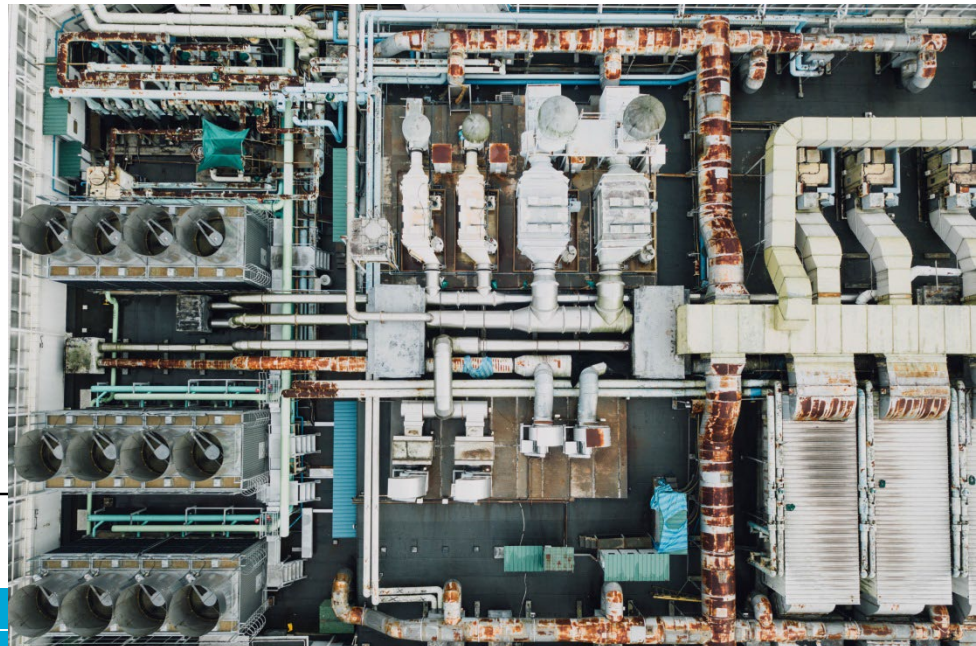
See Fromhold-Eisebith & Werker, 2013, for details.

2.3.2 Industry: Applied Research and Beyond

Entrepreneurship

Motivation to become an entrepreneur

Some facts about entrepreneurs



Entrepreneurship

"… **entrepreneurship** is the process by which new enterprises are founded and become viable …

way of measuring entrepreneurship is to look at new firm formation, i.e. at entry rates (either gross or net, that is entry flows minus exit flows)"

(Vivarelli, 2013, p. 1456, bold by me)

Alternatively: agents creating innovation

includes **intrapreneurship** of large firms, governm.

Motivation to become an entrepreneur

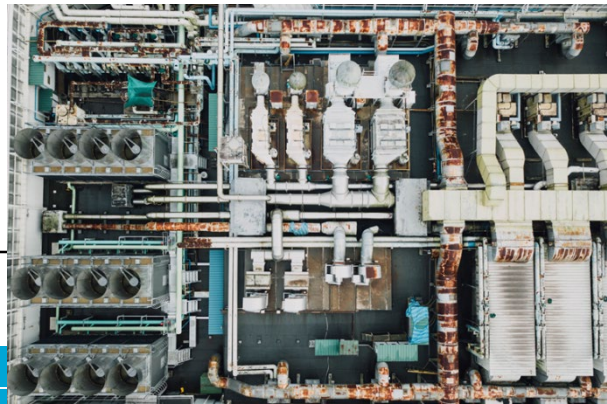
- Progressive factors such as profitability, demand, technological opportunities, innovative potential
- Regressive factors such as low wages / unemployment
- Personal traits such as previous work experience, ethnic background, financial status, and motivation
- Firm characteristics such as age, size, human capital
- Environmental factors: see e.g. government

Some facts about entrepreneurs

- opportunity entrepreneurs motivated by progressive drivers versus
- necessity entrepreneurs pushed by defensive and regressive drivers
- Stylized fact: entry and exit rates are highly correlated ⇒ revolving door
- Developing countries often dominanted by traditional and low-tech sectors

⇒ turbulence more likely

⇒ progressive entrepreneurs



(For details see Vivarelli, 2013)

2.3.3 The Government: Knowledge Infrastructure and Beyond

- Traditionally government provides knowledge infrastructure
- Subsidies for research and development
- Procurement
- Governmental agents as advisors
- Governmental agents as guardians of stakeholders‘ interests

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2.4 Proximity between innovative agents collaborating

Kind of prox.	Distinct attributes
Geographical	Location (pure physical distance)
Institutional	Formal and informal rules & regulations
Social	Embeddedness in knowledge fields, profess. associations or social comm.
Organizational	Organizational objectives and organization-specific formal and informal rules & regulations
Cognitive	Knowledge areas of expertise and experience as well as reputation
Personal	Personal features, personal character traits and behavioural patterns

Introduction: Exercises Chapter 2 I

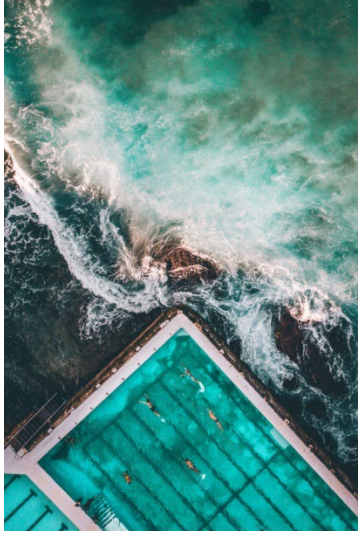
Exercise 2a

- Every student quick-reads the paper by Werker et al., 2017 (see Chapter 3.2 in the Reader) individually, taking notes in the process. (15 minutes)
- Please - as a group - figure out the differences between the innovation systems approach and the Triple Helix approach. (15 minutes).
- Please summarize your findings on the differences between the innovation systems approach and the Triple Helix approach on a slide and upload the document on Brightspace by the end of the day the latest (10 minutes).

BREAK

Introduction: Exercises Chapter 2 II

Exercise 2b



- Have about half of the group focus on the Lochem case and the other one focus on Aardwarmte Den Haag as described and analysed in Werker et al., 2017. Please answer the following questions (20 minutes):
  - Who are the agents, who are the stakeholders of the cases? Are they academic, entrepreneurial, governmental or civic actors
  - What are their interests and motivations?
  - Which agents and stakeholders are close to each other and in which respect (consider the different kinds of proximity for this)?

Introduction: Exercises Chapter 2 III

Exercise 2b

- …
- As a group compare the two cases. Summarize your findings on minimum one page and upload the document on Brightspace by the end of the day the latest (25 minutes).

Please fill in the mud cards (1 minute) and return them to us!

1. What are the three things you learned today?
2. What are the two things you are still curious about?
3. What is the one thing you did not understand?

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