

# Technology Dynamics (MOT113a): EXERCISES

(2023-2024)

*Dr. Claudia Werker*

## WORKSHOPS and ASSESSMENT

To pass the course, students must

1. fully attend all workshops. They must:
  - a. fill in the answers to the multi-choice questions during the lectures,
  - b. join a group, answer the questions of the exercises during the group's work and upload the answers within the deadlines,
  - c. answer and upload answers to two trial exams within the deadlines,
  - d. correct the trial exams of a fellow student and upload their assessment within the deadlines, and
2. pass the exam. The mark of the digital exam is the final mark for Technology Dynamics.

Students who miss any part of a workshop are offered an individual extra-assignment that they must pass to make up for the workshop they missed.

## Exercises for group's work, take-away group's work and individual follow-up

In the following you find three kinds of exercises

- **exercises for group's work to be done during the workshops in the groups sessions**: Uploading the answers to the exercises within the deadline is compulsory (see above) and every student in a group is responsible for making this happen,
- **take-away group's work** which helps you deepening your knowledge and prepare the exam (some of the take-way group's work can be prepared individually but please make sure to meet as a group in between workshops to carry out the joint parts), and
- **tasks for individual follow-up** to prepare the following workshops.

## Workshop I INTRO

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GROUP's WORK on April 26<sup>th</sup>, 2024

Organize your group (20 minutes) by using the slide show provided on Brightspace.


### Chapter 1, Exercise 1a (15 minutes)

Please

- quick-read European Commission (2023): EU Innovation Scoreboard 2023.  
<https://op.europa.eu/en/publication-detail/-/publication/04797497-25de-11ee-a2d3-01aa75ed71a1/language-en> individually;
- take some notes according to the quick-reading slide, in particular
  - What information do you get from reading the abstract and skimming the headings?
  - Read the introduction and the conclusion. What are the main concepts used?
  - What is the research problem and what is its resolution?
  - Which pages or what parts do you have to read carefully in order to understand the gist of the paper or the webpage?

**Skill: Quick Reading**

- Become familiar with the source
  - read the abstract
  - skim the section headings
  - skim the bibliography
- Locate the point of the argument, i.e. the main claim
  - read introduction and conclusion
  - write down the problem and its resolution
  - find the evidence supporting the main claim
- If necessary identify sub-claims
- Identify key concepts
- Determine whether you need to read the paper as a whole or in part.



Source: Booth et al. (1995):  
The Craft of Research, p. 82

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### Chapter 1, Exercise 1b (10 minutes)

- Compare your notes from Exercise 1a and discuss your findings in the group;
  - create a joint slide referring to all points discussed;
  - upload the slides in your group folder by the end of the session the latest.
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## TASKS FOR INDIVIDUAL FOLLOW-UP for April 27<sup>th</sup>, 2024 until May 13<sup>th</sup>, 2024

Please **follow-up on Chapter 1** by

- (re-)reading the respective chapters and the uploads of your group;
- reading papers more detailed when necessary;
- taking notes about what and how to prepare the (trial) exams regarding this chapter; and
- writing up questions you want to ask during the next lecture.

### Chapter 2, Exercise 1

With this exercise you start with blended learning and prepare the flipped classroom for Chapter 2.1. Chapters 2.2 to 2.4 are taught traditionally.

Please

- read Chapter 2.1 and watch the respective video (see Reader)
- open a Word Document and take notes about new concepts, empirical findings, methods and particularly about questions you have;
- quick-read the papers in Readings of Chapter 2.1, read in detail what you need to read to answer your questions;
- note down questions that are still open afterwards
- **share you Word Document in the groups folder by uploading it on Brightspace until Monday, May 13, 2024 the latest.**
- write up questions you want to ask during the next lecture regarding Chapter 2.1 which will be in flipped classroom style.

Please write up questions you want to ask during the next lecture regarding Chapters 3 and 4 which will be in flipped classroom style.

### Chapter 3, Exercise 1a

With this exercise you use blended learning and prepare the flipped classroom for Chapter 3.1. Chapter 3.2 is about the cases covered in Exercise 2 of Chapter 3. **Please prepare this before you meet as a group in between workshops.**

Please

- read Chapter 3 and watch the respective videos (see Reader);
  - quick-read Bergek et al., 2015;
  - determine what you need to read in detail of this paper;
  - **decide what needs to be read and do so, and**
  - **write-up your questions for the meeting with group.**
  - **use the framework by Bergek et al., 2015, to analyse the Lochem and the Aardwarmte Den Haag case as described and analysed in Werker et al., 2017, do not forget to define the term technological innovation system to start with;**
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## TAKE-AWAY Group's Work for April 27<sup>th</sup>, 2024 until May 13<sup>th</sup>, 2024

### Chapter 1, Exercise 1c (15 minutes)

Please quick-read the paper by Edquist et al. 2018 individually and take notes about the main concepts used, the research problem and its resolution.

### Chapter 1, Exercise 1d (15 minutes)

As a group please critically assess the European Innovation Scoreboard 2023 in the light of Edquist et al. 2018.

1. What kind of information does the European Innovation Scoreboard 2023 provide?
2. What kind of information does it not provide?
3. Is the use of the indicators and the interpretation of the data correct?

Write up the results on minimum half a page and **upload them in your group folder until Monday, May 13, 2024.**

### Exercise 1e (20 minutes)

Please

- as a group let everyone pick a different country from the EU Innovation Scoreboard;
- figure out the strengths and weaknesses of this country with the help of the innovation indicators used in the EU Innovation Scoreboard individually;
- prepare one slide with your main results

### Chapter 1, Exercise 1f (30 minutes)

Please

- present your results from Exercise 1e to each other (15 minutes) and
- discuss which country scores best and which worst (15 minutes). In particular, critically assess the indicators used. The person taking notes writes-up your conclusions on about one page.
- **Upload your slides and your conclusions on Brightspace until Monday, May 13, 2024 the latest.**

### Chapter 3, Exercise 1b (10 minutes)

Please as a group

- discuss open questions regarding the Bergek et al., 2015, paper with your fellow students;
- note questions still open down in a document and
- **upload it on Brightspace until Monday, May 13, 2024 the latest.**

### Chapter 3, Exercise 1c (30 minutes)

Please as a group

- write up your findings on at least one page on the Lochem and the Aardwarmte Den Haag case, refer to the parts in the papers you used, i.e. short citation, including page number and paragraph with full citation at the end.
- **Upload the document on Brightspace until Monday, May 13, 2024 the latest.**

### Chapter 4, Exercise 1 (40 minutes)

With this exercise you use blended learning and prepare the flipped classroom for Chapter 4.1 and 4.2. Chapter 4.3 is about the cases covered in Exercise 3 of Chapter 4.

Please

- read Chapter 4 and watch the respective videos (see Reader) individually;
- quick-read the Readings of Chapter 4 individually; and
- **determine as a group which (parts of) of the papers you need to read in detail to fully understand Chapter 4.**

### Chapter 4, Exercise 2a (40 minutes)

Please

- individually watch the following video:  
[https://www.youtube.com/watch?v=v\\_ng8tJPVB0](https://www.youtube.com/watch?v=v_ng8tJPVB0)
- **as a group determine which parts of the paper by Nevzorova, 2022, you have to read to answer the following questions:**
  - What is the research question, the claim, the reasons and the evidence given in the paper?
  - Which method and which indicators were used?
  - What is the focal geographical dimension of the Russian biogas case?
  - Discuss the functional factors of the Russian biogas case.
  - Do you agree with the findings of the paper? Please particularly discuss the reliability of the indicators used. Go back to chapter 1 to assess the indicators.
- do the reading accordingly.

### Chapter 4, Exercise 2b (30 minutes)

- **answer the questions posed in Exercise 2a and;**
- **upload them on Brightspace not later than Monday, May 13, 2024.**

### Feedback for the chairperson (10 minutes)

Please

- get familiar with the start, stop, continue method  
(<https://www.sessionlab.com/methods/start-stop-continue>);
  - give constructive and detailed feedback to the chairperson.
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## WORKSHOP II Innovation Systems

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### Tasks for the chairperson **before** May 15<sup>th</sup>, 2024

As designated chairperson please prepare the following in advance:

- read the exercises of the sessions of May 15<sup>th</sup> and 16<sup>th</sup>, 2024 and make yourself familiar with the time-line;
- prepare a slide with the questions and the links to the material necessary so that the group can start with working right away;
- make sure that the group members will be present and that those responsible for taking notes and uploading are aware and prepared.

If due to unforeseen circumstances you cannot be the chairperson on that day make sure that someone else takes over well in advance of the session.

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### GROUP's WORK on May 15<sup>th</sup>, 2024

Organize your group (**5 minutes**): Please take a seat, settle in and make sure that you have groups members doing the chairing (already determined before), taking notes and uploading for this and the next group's session.

#### Chapter 2, Exercise 2a (**40 minutes**)

- Every student quick-reads the paper by Werker et al., 2017 (see Chapter 2.3 in the Reader for the link) 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 session the latest** (**10 minutes**).

#### Chapter 2, Exercise 2b (**45 minutes**)

- 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)?
- 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 session the latest** (**25 minutes**).

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## GROUP's WORK on May 16<sup>th</sup>, 2024

### Chapter 3, Exercise 2 (30 minutes)

Please

- quick-read the paper by Nevzorova, 2022, individually;
- determine as a group which parts to read in detail to answer the following questions:
  - What is the focal TIS of the Russian biogas industry?
  - What is the sectoral context?
- do the reading individually;
- answer the questions jointly on half a page;
- put these answers together with the answers to Exercise 2 of Chapter 4 in one document; and
- **upload the document on Brightspace at the end of the session the latest.**

### Chapter 4, Exercise 3a (60 minutes)

Please split up the two cases, i.e.

- the case of the Bangalore software industry as analysed in Chamiade and Vang, 2018, and
- the case of the Swiss national innovation system as analysed in Marxt and Brunner, 2013,

between the group members.

Please

- individually quick-read the paper of the case you are assigned to;
  - as a group figure out what the major concepts used, the research questions and resolutions of the papers are;
  - as a group discuss how you can analyse the two cases using the knowledge you obtained in chapter 0 to 4;
  - individually solve the case you are assigned to accordingly;
  - as a group discuss the findings and compare the two cases
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## TAKE-AWAY Groups Work for May 17<sup>th</sup>, 2024 until May 27<sup>th</sup>, 2024

### Chapter 4, Exercise 3b (85 minutes)

Please as a group

create an exam of 1.5 hours assigning 90 points (for about each minute spent one point to indicate the time and the effort) for either the two cases you analyzed. Put both questions and model answers in a document and upload it on Brightspace no later than Monday, May 27, 2024.

### Chapter 5, Exercise 1a (40 minutes)

Please

- read Chapter 5 individually;
- quick-read the paper in the Readings Section individually;
- determine as a group which (parts of) of the papers you need to read in detail to fully understand Chapter 5.

### Chapter 6, Exercise 1a (40 minutes)

Please

- read Chapter 6 and watch the respective videos (see Reader) individually;
- quick-read the paper in the Readings Section individually;
- watch the videos and take notes
  - <https://www.youtube.com/watch?v=dGGayYzLSRQ&feature=youtu.be>
  - [https://www.youtube.com/watch?v=VI2Qp\\_D1KfE&feature=youtu.be](https://www.youtube.com/watch?v=VI2Qp_D1KfE&feature=youtu.be)
  - <https://www.youtube.com/watch?v=GauvZRC8CW4&feature=youtu.be>
- determine as a group which (parts of) of the papers you need to read in detail to fully understand Chapter 6.

### Feedback for the chairperson (5 minutes)

Give constructive and detailed feedback on the chairing of the group using the [start, stop, continue method](#).

### Feedback for the groups work (10 minutes)

Please give a quick round of feedback about how everyone in the group contributes by using the distinctions under the heading “Ensure everyone contributes” on this [webpage](#).

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## TASKS FOR INDIVIDUAL FOLLOW-UP for May 17<sup>th</sup>, 2024 until May 27<sup>th</sup>, 2024

Please follow-up on **Chapter 2** by

- re-reading the chapter;
- reading the literature in the Readings of Chapter 2 more detail when necessary; and
- taking notes about what and how to prepare the (trial) exams for this chapter.

Please follow-up on **Chapter 3** by

- re-reading the respective chapter;
- reading the papers in the Readings of Chapter 3 in more detailed when necessary; and
- taking notes about what and how to prepare the (trial) exams.

Please follow-up on **Chapter 4** by

- re-reading the respective chapter;
- reading the papers in the Readings of Chapter 4 in more detailed when necessary; and
- taking notes about what and how to prepare the (trial) exams.

### **Chapter 4, Exercise 3c**

Please repeat Exercise 3b for the case you did not do in the group.

Please take all the notes of what and how to prepare chapters 0 to 4 for the (trial) exams and prepare accordingly.

### **Chapter 5, Exercise 1b**

Please do the reading as agreed upon during Exercise 1a.

### **Chapter 6, Exercise 1b**

Please do the reading as agreed upon during Exercise 1a.

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## WORKSHOP III RRI

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### Tasks for the chairperson **before** May 29<sup>th</sup>, 2024

As designated chairperson please prepare the following in advance:

- make sure that the assessment criteria of the trial exam are available to the groups' members;
- read the exercises of the sessions of May 29<sup>th</sup> and 30<sup>th</sup>, 2024 and make yourself familiar with the time-line;
- prepare a slide with the questions and the links to the material necessary so that the group can start with working right away;
- make sure that the group members will be present and that those responsible for taking notes and uploading are aware and prepared.

If due to unforeseen circumstances you cannot be the chairperson on that day make sure that someone else takes over well in advance of the session.

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### GROUP's WORK on May 29<sup>th</sup>, 2024

Organize your group (**5 minutes**): Please take a seat, settle in and make sure that you have groups members doing the chairing, taking notes and uploading for this and the next group's session.

### **Trial exam I**

Please within **45 minutes**

- assess the exam of the indicated fellow student uploaded on Brightspace with the help of the assessment criteria provided on Brightspace
- discuss with your fellow students
  - which parts you found difficult to assess,
  - in which parts you found inspiration for answering similar questions better in the future and
  - what you learned for preparing an exam.
- **Summarize your findings on one page and upload them on Brightspace by the end of the session the latest.**

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## Exercises for the groups work on May 29<sup>th</sup>, 2024

### Chapter 5, Exercise 2 (45 minutes)

Please

- have a look at the cases you analysed for Chapters 2, 3 and 4 and identify the values that play a role for the stakeholders in these cases;
- put your results in a document, preferably using a table
- compare the cases
- put your findings on the comparison in a document;
- upload it **on Brightspace until the end of the session the latest.**

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GROUP's WORK on May 30<sup>th</sup>, 2024

Organize your group (5 minutes): Please take a seat, settle in and make sure that you have groups members doing the chairing, taking notes and uploading for this and the next group's session.

### Chapter 6, Exercise 2 (35 minutes)

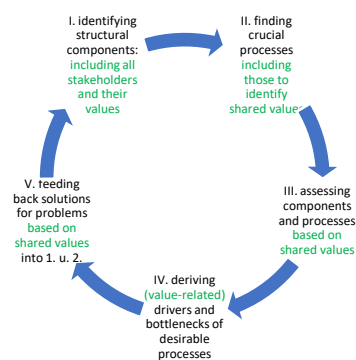
Please as a group

- have a look at the indicators introduced in Werker et al., 2020;
- discuss their advantages and disadvantages;
- figure out in what way do they differ or are similar to the indicators introduced in Chapter 1;
- summarize your findings in a file and **upload it on Brightspace by the end of the session the latest.**

### Chapter 6, Exercise 3 (50 minutes)

As a group, please take any of the cases you analysed so far. Make sure that you can answer the following questions based on the material you have or find additional material on <https://scholar.google.com>.

Please use the scheme from Werker, 2020, Figure 11.2: Write up your findings in a document, indicate your sources and **upload it on Brightspace by the end of the session the latest.**



into I. and II.

- I. identify the structural components including all innovative agents and/or stakeholders and their values (use results from Ex. 1 of Chapter 6)
  - II. find crucial processes including those to identify shared values
  - III. assess components and processes based on shared values (if you can detect them, else provide some insights how they could look like)
  - IV. derive (value-related) drivers and bottlenecks of desirable processes
  - V. propose solutions for problems based on shared values
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TAKE-AWAY Groups Work for May 31<sup>st</sup>, 2024 until June 5<sup>th</sup>, 2024

### **Trial exam I**

Please as a group discuss in **85 minutes**

- your experience during the exam: how did you do regarding timing, being calm or not etc.;
- the parts of the exam that went smoothly and the ones that did not;
- do advice and help each other on parts that did not go so well;
- write up a plan for each group member about the parts that did not go smoothly and **upload the document no later than Wednesday, 5 June, 2024.**

### **Exercise to prepare trial exam II**

#### **Chapter 6, Exercise 4**

Please take a case you did not choose for Chapter 6, Exercise 3, and repeat the analysis of Exercise 2 for this case.

#### **Feedback for the chairperson (5 minutes)**

Give constructive and detailed feedback on the chairing of the group using the [start, stop, continue method](#).

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## TASKS FOR INDIVIDUAL FOLLOW-UP for May 31<sup>st</sup>, 2024 until June 5<sup>th</sup>, 2024

Please look carefully at the assessment of your trial exam I. Follow the plan as discussed with the group to catch up.

Please follow-up on **Chapters 5, 6 and 7** by

- re-reading the respective chapter;
  - reading the papers in the Readings of Chapters 5, 6 and 7 in more detailed when necessary;
  - taking notes about what and how to prepare the (trial) exams; and
  - take all the notes of what and how to prepare chapters 5 to 7 for the (trial) exams and prepare accordingly.
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## WORKSHOP IV OUTRO

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### Tasks for the chairperson **before** June 7<sup>th</sup>, 2024

As designated chairperson please prepare the following in advance:

- make sure that the assessment criteria of the trial exam are available to the groups' members;
- read the exercises of the session of June 7<sup>th</sup>, 2024 and make yourself familiar with the time-line;
- prepare a slide with the questions and the links to the material necessary so that the group can start with working right away;
- make sure that the group members will be present and that those responsible for taking notes and uploading are aware and prepared.

If due to unforeseen circumstances you cannot be the chairperson on that day make sure that someone else takes over well in advance of the session.

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### GROUP's WORK on June 7<sup>th</sup>, 2024

Organize your group (**5 minutes**): Please take a seat, settle in and make sure that you have groups members doing the chairing, taking notes and uploading for this and the next group's session.

### **Trial exam II**

Please within **40 minutes**

- assess the exam of the indicated fellow student uploaded on Brightspace with the help of the assessment criteria provided on Brightspace
- discuss with your fellow students
  - which parts you found difficult to assess,
  - in which parts you found inspiration for answering similar questions better in the future and
  - what you learned for preparing an exam.
- **Summarize your findings on one page and upload them on Brightspace by the end of the session the latest.**

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**Exercises for the groups work on June 7<sup>th</sup>, 2024**

**Chapter 7 Exercises to be announced**

**45 minutes**

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## TAKE-AWAY Groups Work for June 8<sup>th</sup>, 2024 until June 11<sup>th</sup>, 2024

### Instructions

#### **Chapter 7, Exercises to be announced**

**45 minutes**

#### **Trial exam II**

Please as a group discuss in **20 minutes**

- your experience during the exam: how did you do regarding timing, being calm or not etc.;
- the parts of the exam that went smoothly and the ones that did not;
- do advice and help each other on parts that did not go so well
- write up a plan for each group member about the parts that did not go smoothly and **upload the document no later than Tuesday, June 11<sup>th</sup>, 2024.**

Please as a group come up with a plan of how and when to support each other in the coming days before the exam. (**20 minutes**)

Please upload your plan including time schedule of meetings and content on Brightspace on Tuesday, June 11th, 2024 the latest.

#### **Feedback for the chairperson (5 minutes)**

Give constructive and detailed feedback on the chairing of the group using the [start, stop, continue method](#).

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## TASKS FOR INDIVIDUAL FOLLOW-UP for June 8<sup>th</sup>, 2024 until June 16<sup>th</sup>, 2024

Please

- go through the whole course material;
- repeat the exercises that you found difficult and only check the answers after you did them; and
- follow-up on the plan you made with your group.

Success with your preparation!