

# ***COVID-19 PANDEMIC BOOSTING DIGITAL TECHNOLOGIES***

—  
Lenka Hebáková, Tomáš Ratinger, Iva Vančurová TC CAS (CZ)  
Mahshid Sotoudeh ITA (AT)  
Arminas Varanauskas KEF (LT)  
25. 7. 2022 – ETAC5 session 15:45-17:15 CET

# INTRODUCTION TO THE SESSION AND 4TECH

- Key input: **4Tech project** (*Development of selected technologies during and after COVID-19 crisis*). National project financed by TA CR (CZ).
- 3 presentations from 3 countries: CZ, AT, LT followed by a discussion.
  - TC CAS: *Changing attitudes towards digital technologies: effect of the Covid 19 pandemic* (TR)
  - ITA: *Chances and limits of distance learning from a pedagogical and social perspective* (MS)
  - KEF: *Learning in post-pandemic: back to “normal” or back to better?* (AV)

4Tech project = Focus on the following 4 Technologies:

- digitalization and cloud technology,
- additive production,
- telemedicine and
- digital (distant) forms of education.



# 4TECH RESEARCH – OBJECTIVES



Main aim of the project ...

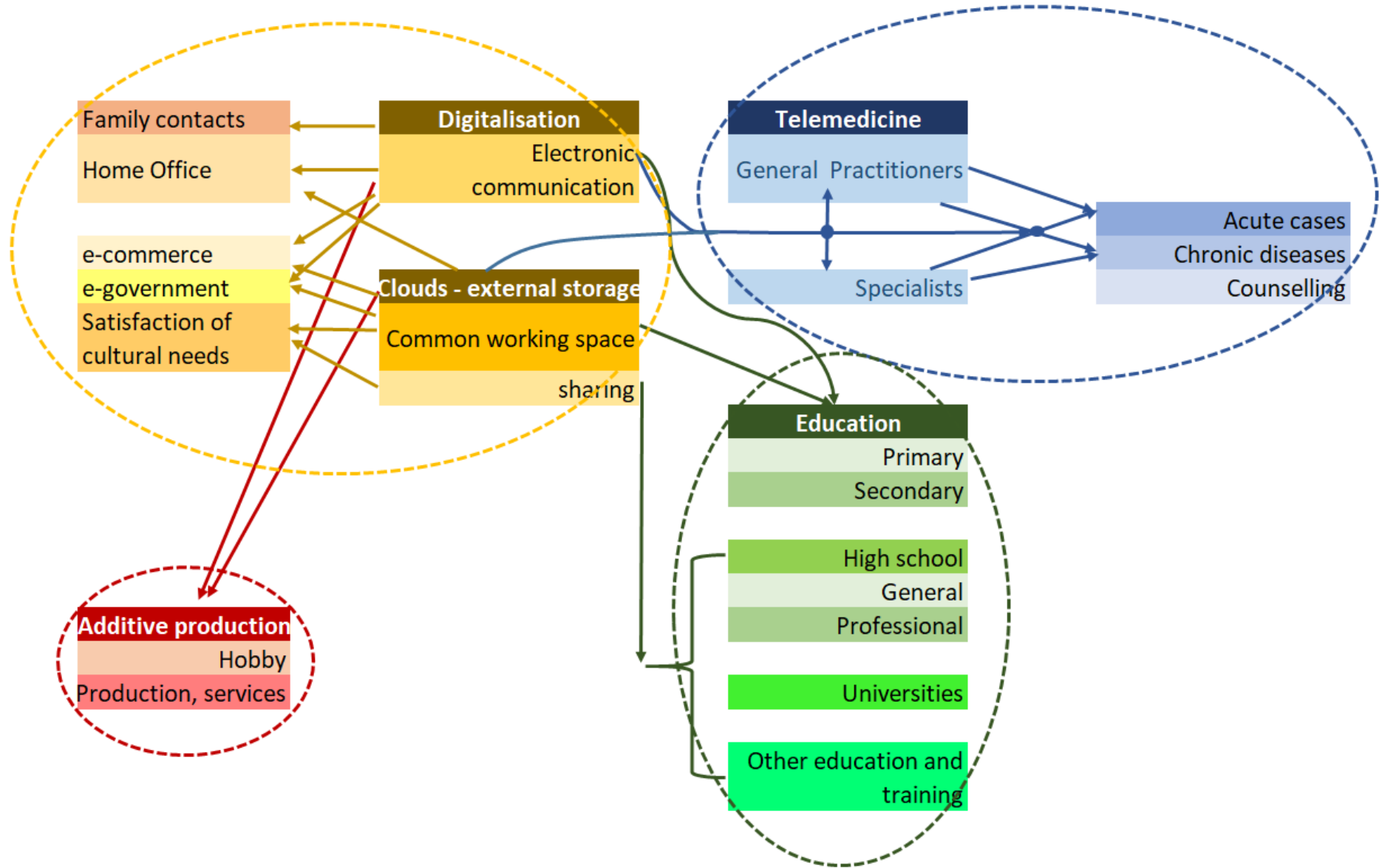
*... is to capture the impulses induced by the COVID-19 crisis which affected rural development drivers.*

Specific objectives:

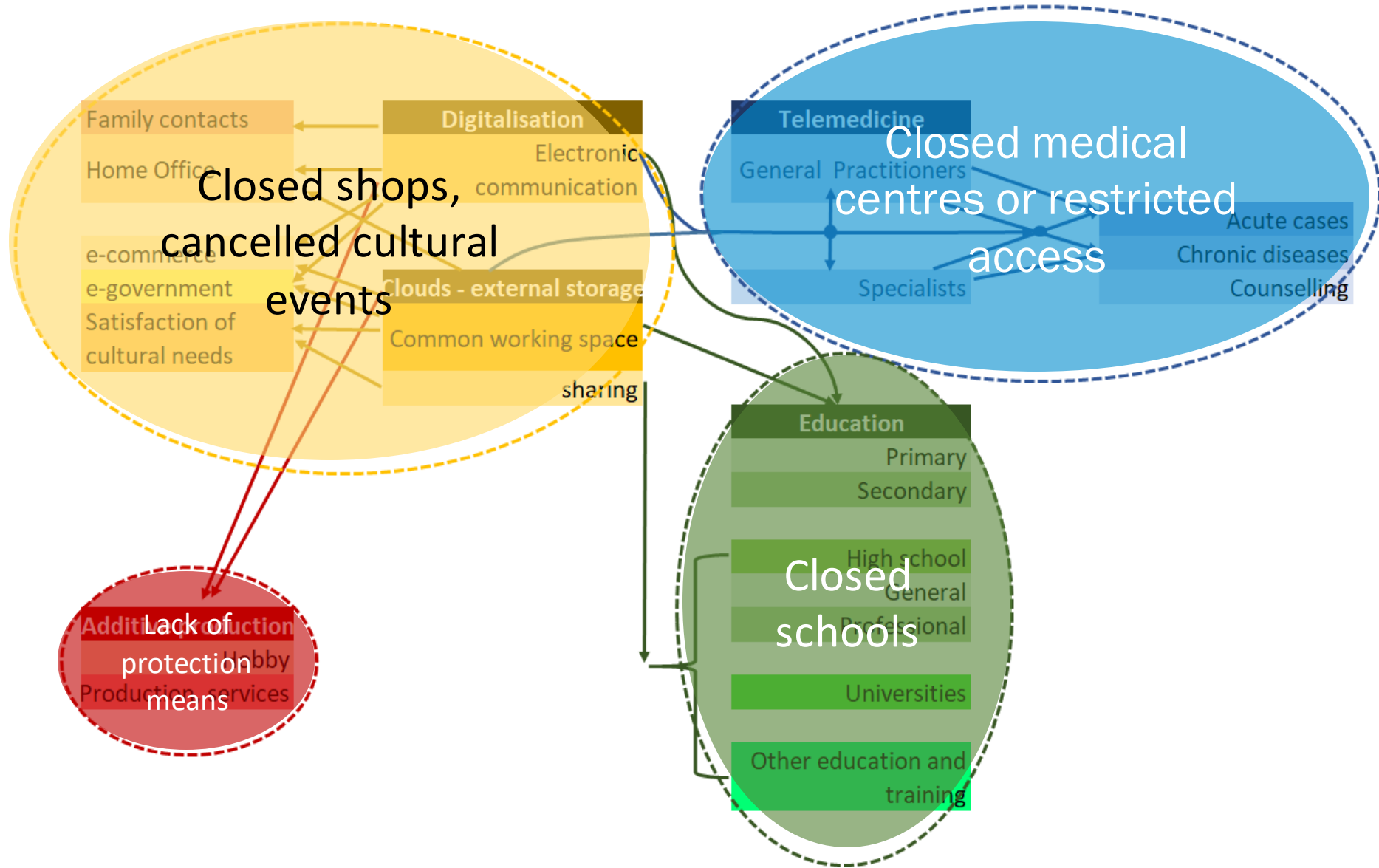
- To map extent and forms of the use of 4 technologies: digitalization and clouds, additive production, telemedicine and distant education in association with COVID-19 measures
- To analyze fulfilment of needs (linked to COVID-19 measures) and the actors' collaboration level in the respective technological areas
- To explore the change of values and attitudes of actors in respect to the 4 technologies induced by the COVID-19 pandemic
- To conduct a foresight study on the development of the technologies



# 4 TECHNOLOGIES



# 4 TECHNOLOGIES AND THE COVID-19 PANDEMIC



# SESSION AGENDA

## PART 1

- *Introduction 15,45 – 15,50*
- *3 presentations with pitches – 15,50-16,20*
- *Questions and answers 16,20-16,30*

## PART 2

- *Interactive discussion in groups – window of opportunity*
- *Roles of participants and format will be explained after PART 1*
- *Group talks will be structured around pitches, moderated and facilitated*
- *Conclusions will be presented by group rapporteurs in the end to all in the plenary*
- *Outputs from the discussion on spot as well as online will be used for the 4Tech project.*





# The four emerging technologies in the COVID-19 pandemic and beyond

## What has changed in the sociotechnical landscape?

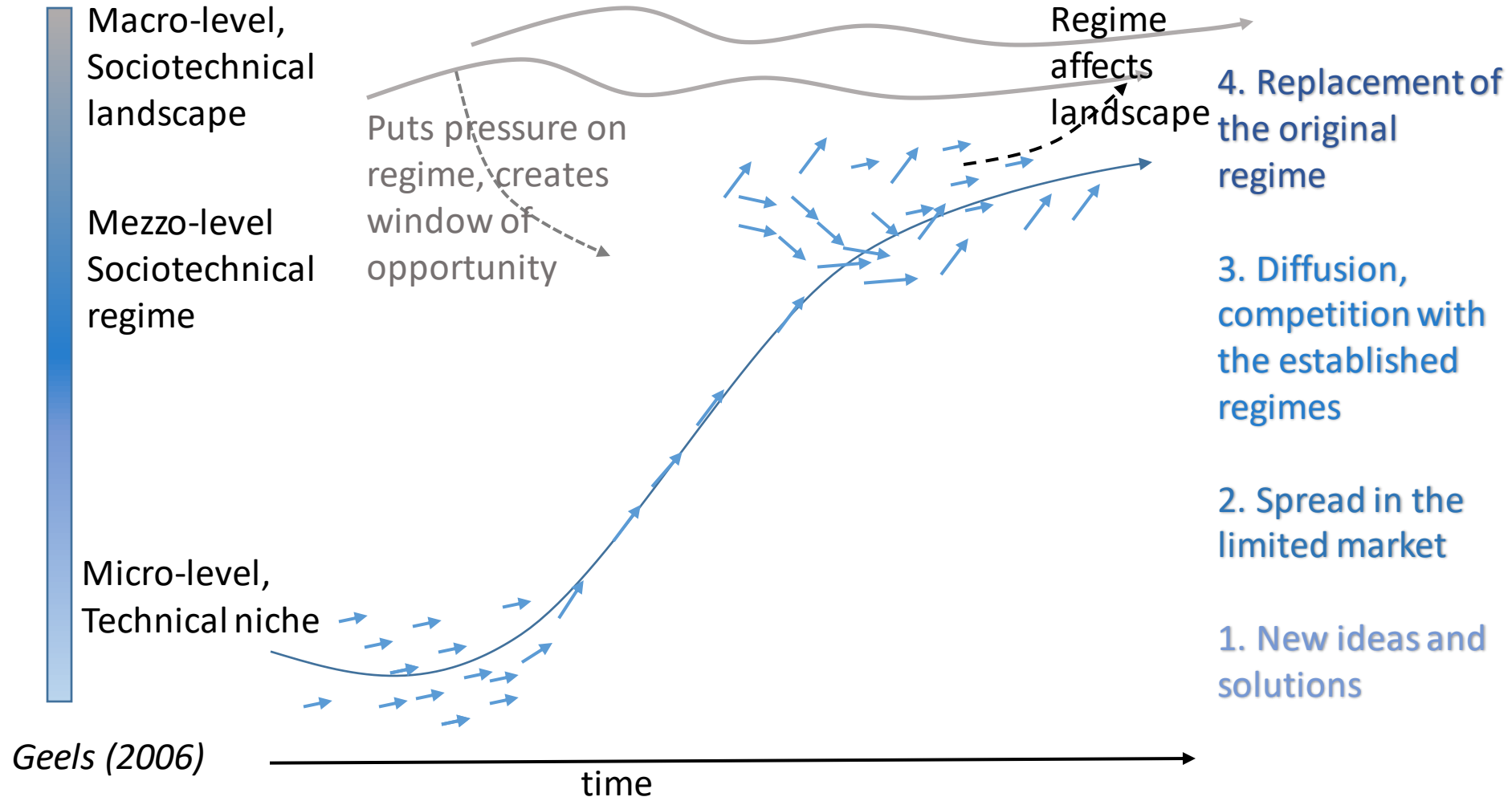
TA conference

25. July 2022



Faculty of Economics and Management,  
Czech University of Life Sciences

# Concept: Multi-level Perspective on System Innovation





# Restrictions related to Covid 19 pandemic: window of opportunity

Technological trends (e.g. web 3.0, virtual and extended reality, etc.)

Institutional conditions

Education system

Societal values

Sociotechnical landscape in the post-pandemic period

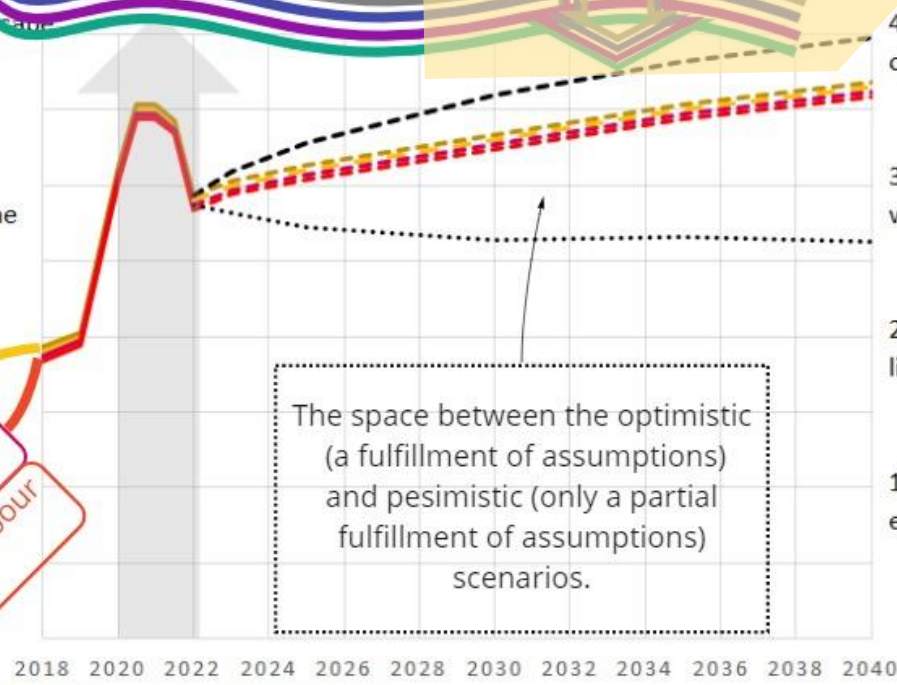


Macro-level Sociotechnical landscape

Mezzo-level Sociotechnical regime

Mikro-level Technical niche

- Capital and investment
- Technical equipment
- Knowledge and skills
- Human resources, labour market

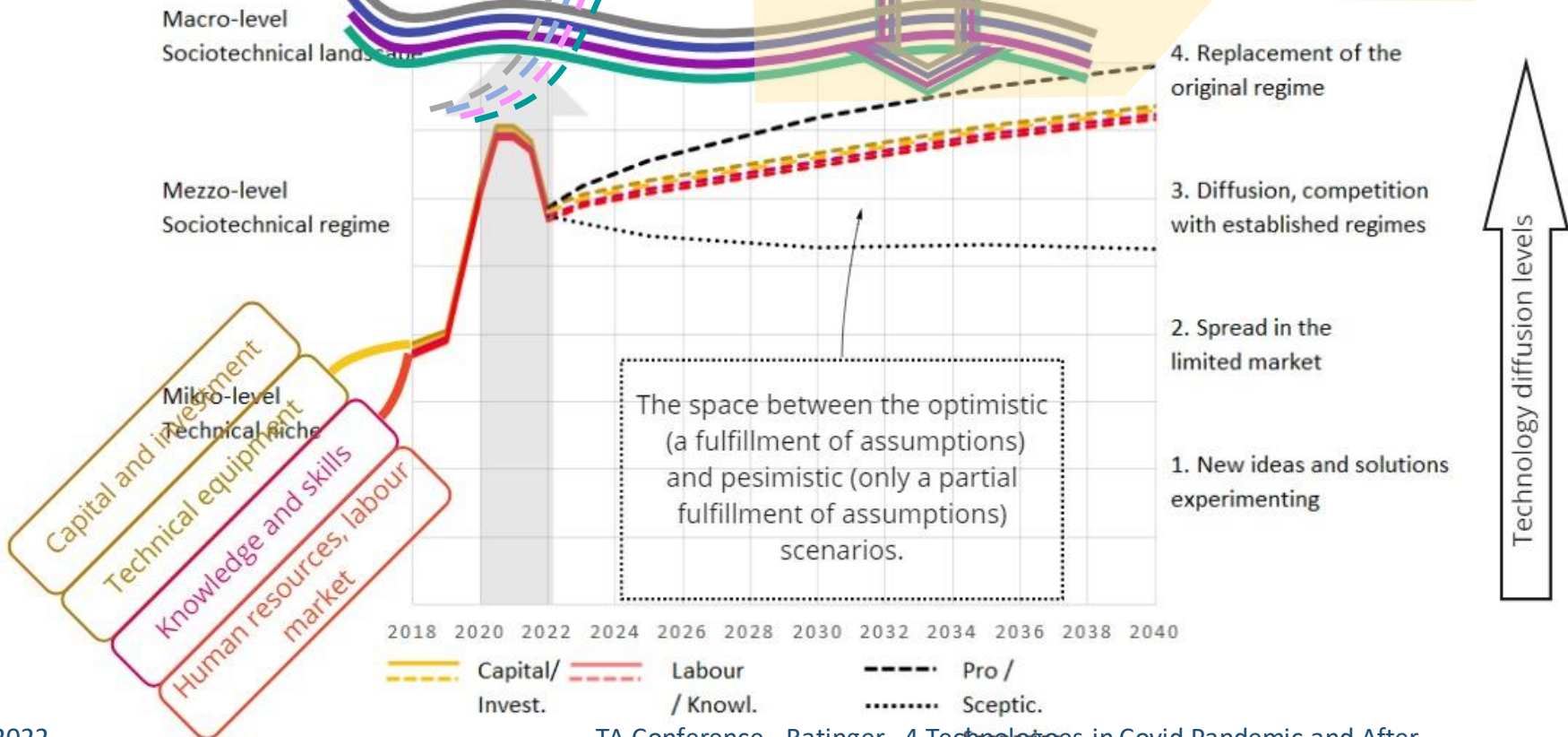
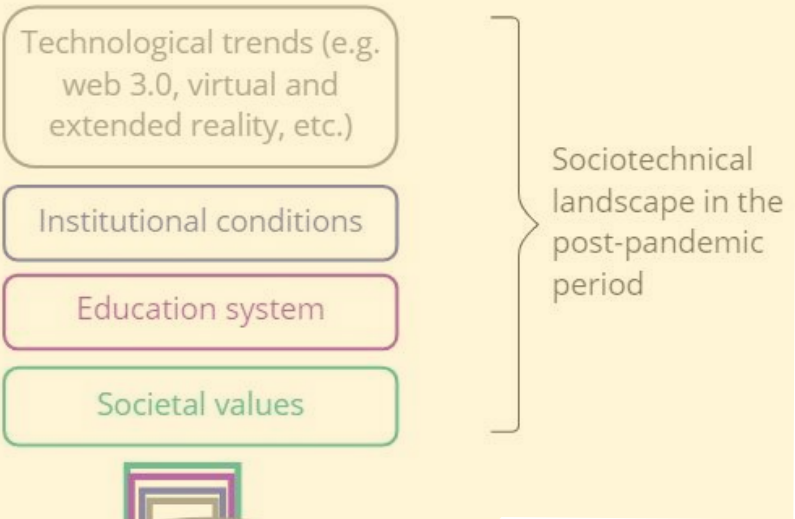


1. New ideas and solutions experimenting
2. Spread in the limited market
3. Diffusion, competition with established regimes
4. Replacement of the original regime

Technology diffusion levels



# Effects on the sociotechnical landscape



# Conclusions of the analysis of “lockdown” boosts

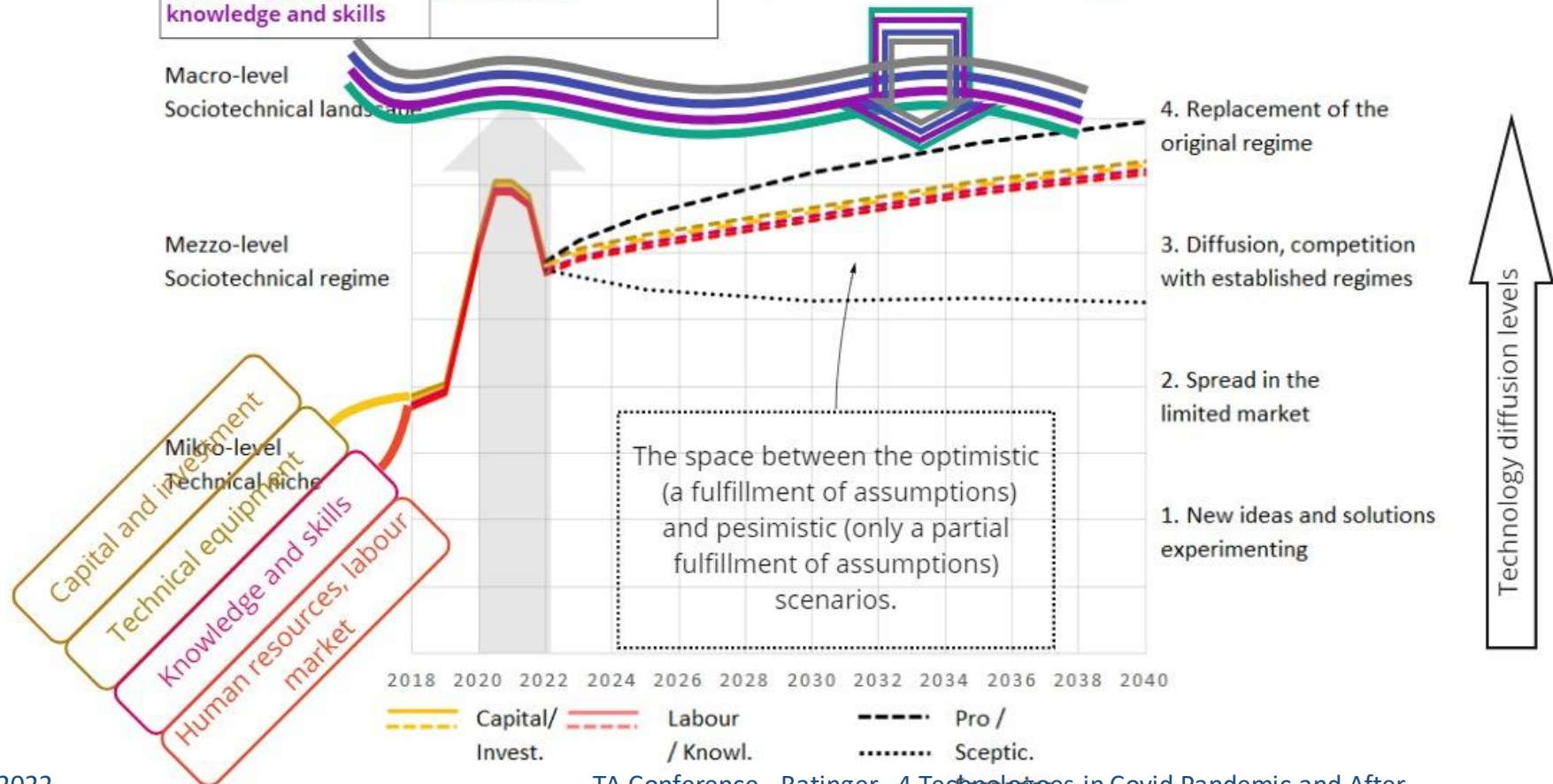


- ICT equipment + infrastructure
  - Intensive use → need for more capacity
- Learning and changing attitudes
  - Learning by doing, the length of the lockdown, previous experinec
- Institutional conditions / changes
  - Adoption in the emergency situation → need for institutional changes
- Digital divide effects
  - Technical (easy with state assistance, civil society), social (more serious)
- A special lesson of the additive production

Need for adequate technical equipment for more intensive use of digital based services	Need for a bigger capacity of data network connections
Need for legal and other institutional changes (particularly in the education and health sectors)	New distributions of responsibilities and forms of collaboration
Accelerated learning process - gaining knowledge and skills	Shift in societal values / preferences



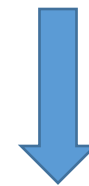
Sociotechnical landscape in the post-pandemic period



# Foresight approach



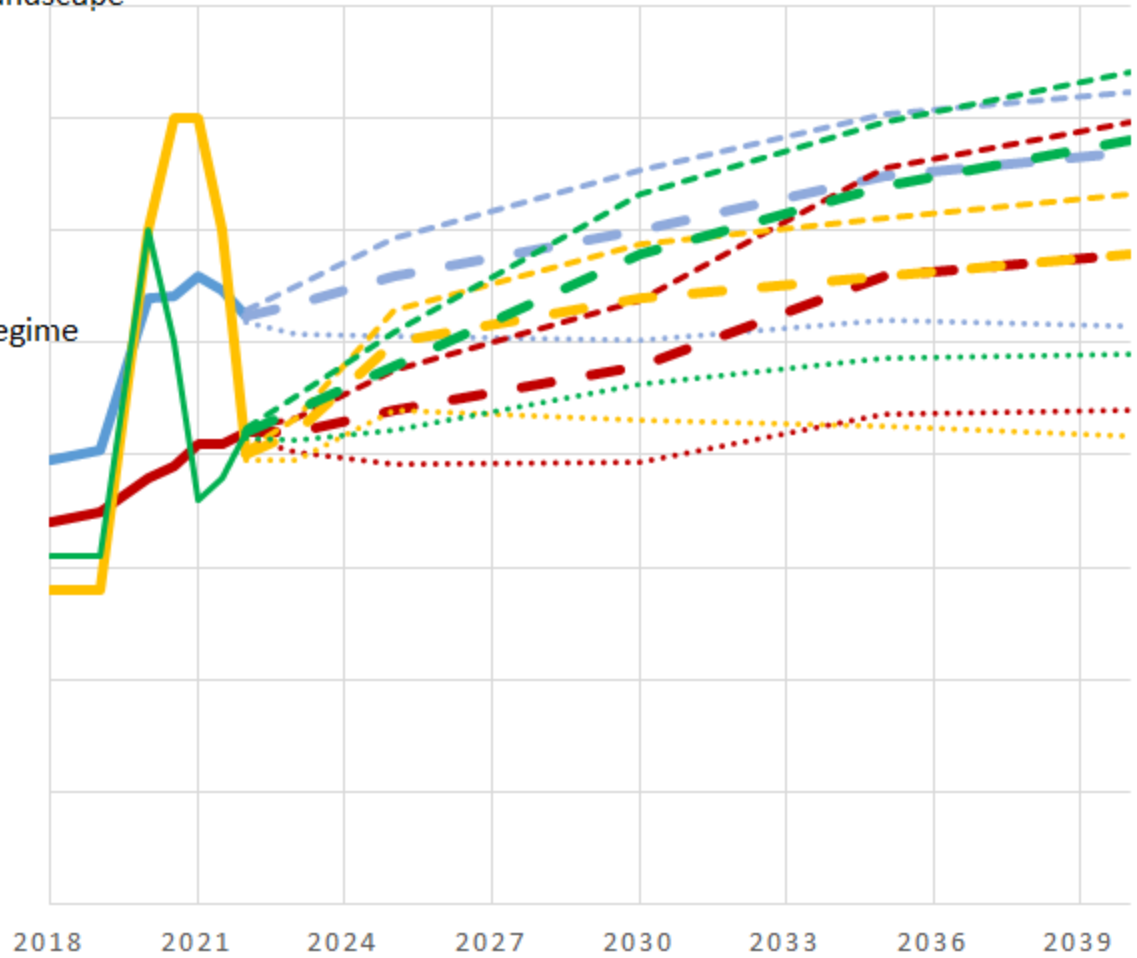
- If the “pandemic impulse” contribute to the diffusion of the selected technologies and their dominance by 2040 ?
  - Becoming “sociotechnical regimes”
- Two scenarios Pro (positive) and Sceptical.
- Expert panel for each technology
  - What does it mean becoming a regime?.
  - SWOT analysis →
    - Key internal factors (including “pandemic” lessons)
    - Key external factors: trends and long term policies
  - Stakeholders
  - Effects: What will change most in the life of citizens and firms, geographical and social implications.



Macro-level  
Sociotechnical landscape

Mezzo-level  
Sociotechnical regime

Micro-level  
Technical niche



4. Replacement of the original regime

3. Diffusion, competition with established regimes

2. Spread in the limited market

1. New ideas and solutions, experimenting

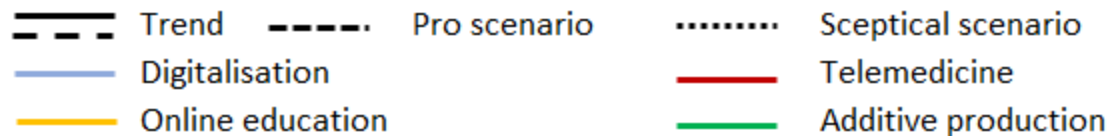
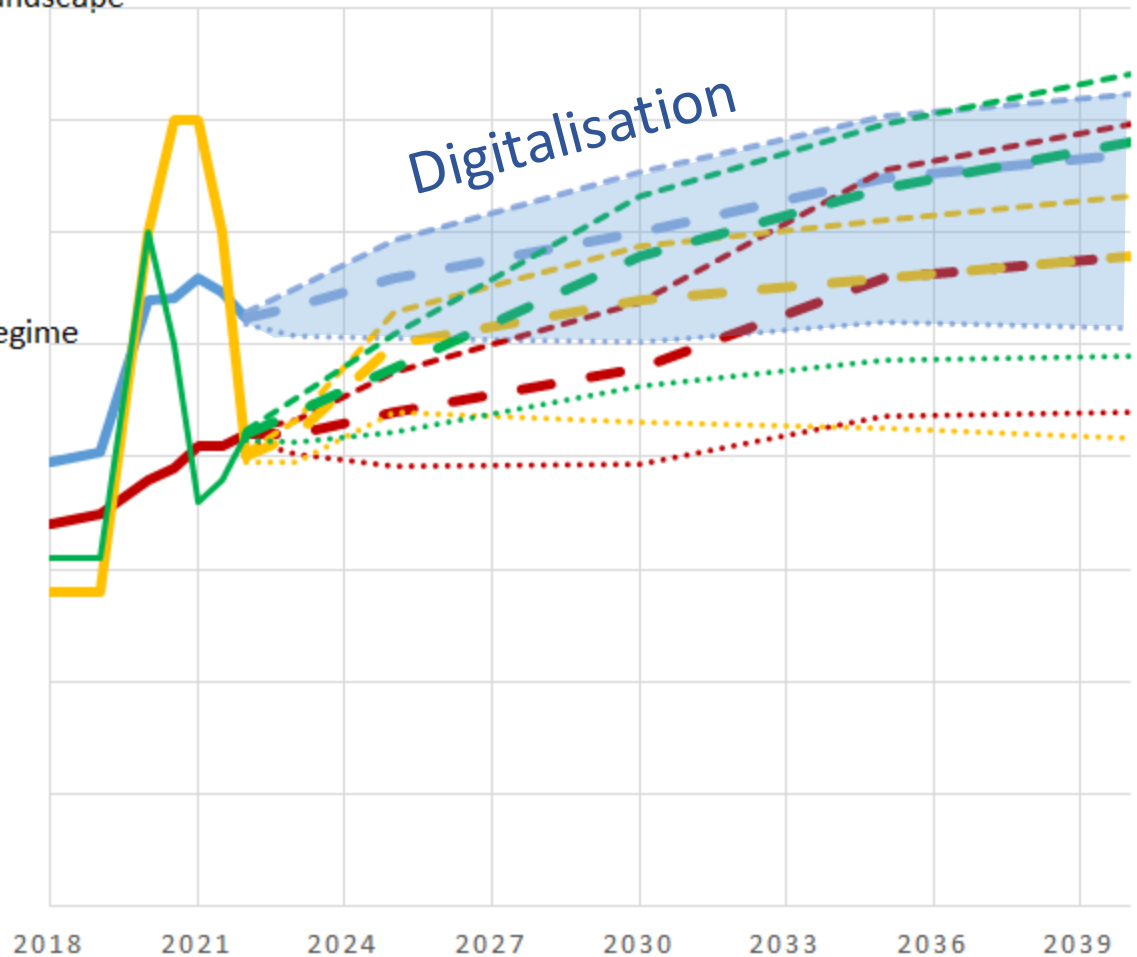


- Trend
- Pro scenario
- ..... Sceptical scenario
- Digitalisation
- Telemedicine
- Online education
- Additive production

Macro-level  
Sociotechnical landscape

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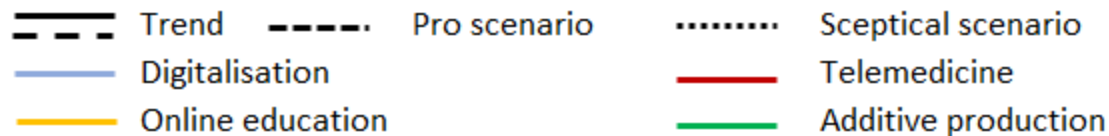
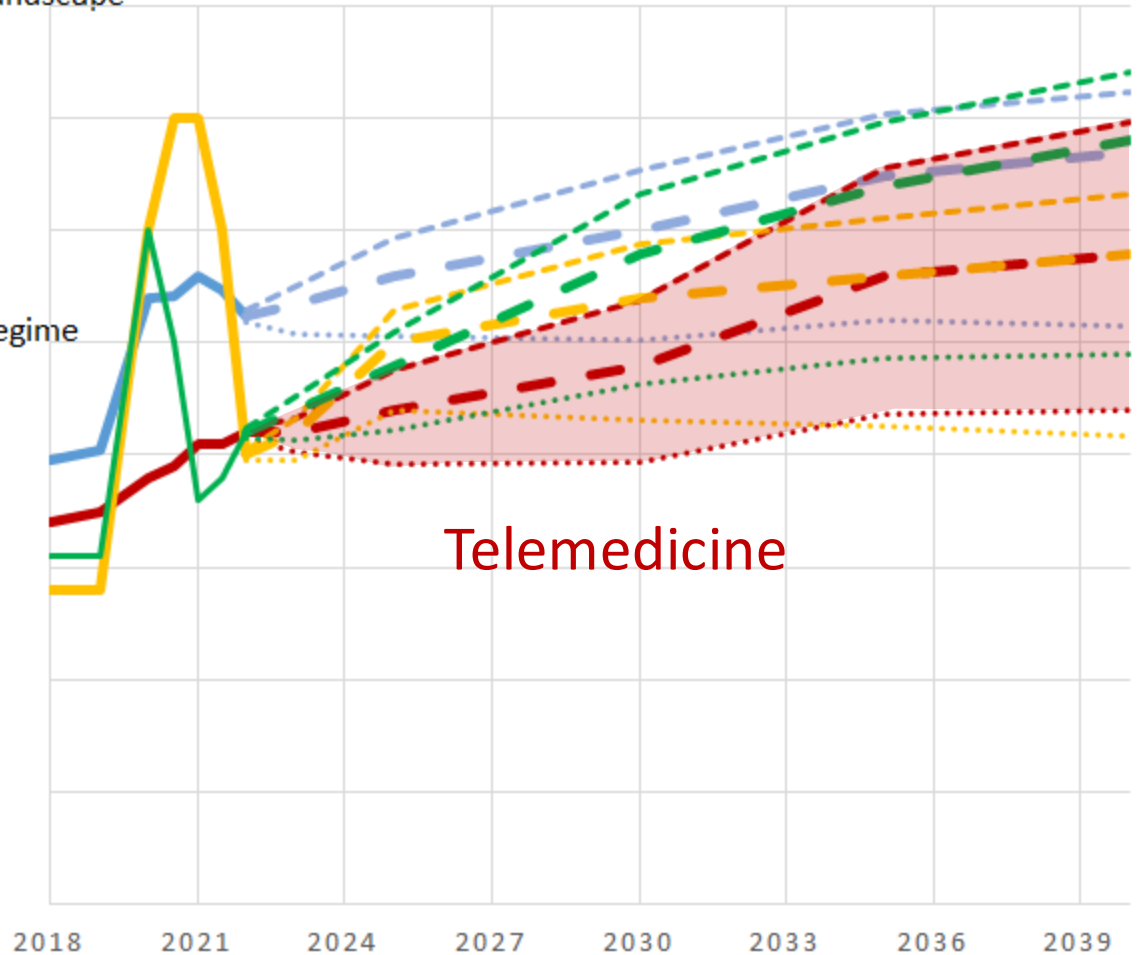
## Factors

- Improving the coverage of the high speed internet
- Effective cyber security
- Qualified IT people in public administration
- Legislation favouring digitalization (at least not hindering)
- Coming ICT literal generations
- Education strengthening digital and financial literacy
- Accompanying services (e.g. logistic)

Macro-level  
Sociotechnical landscape

Mezzo-level  
Sociotechnical regime

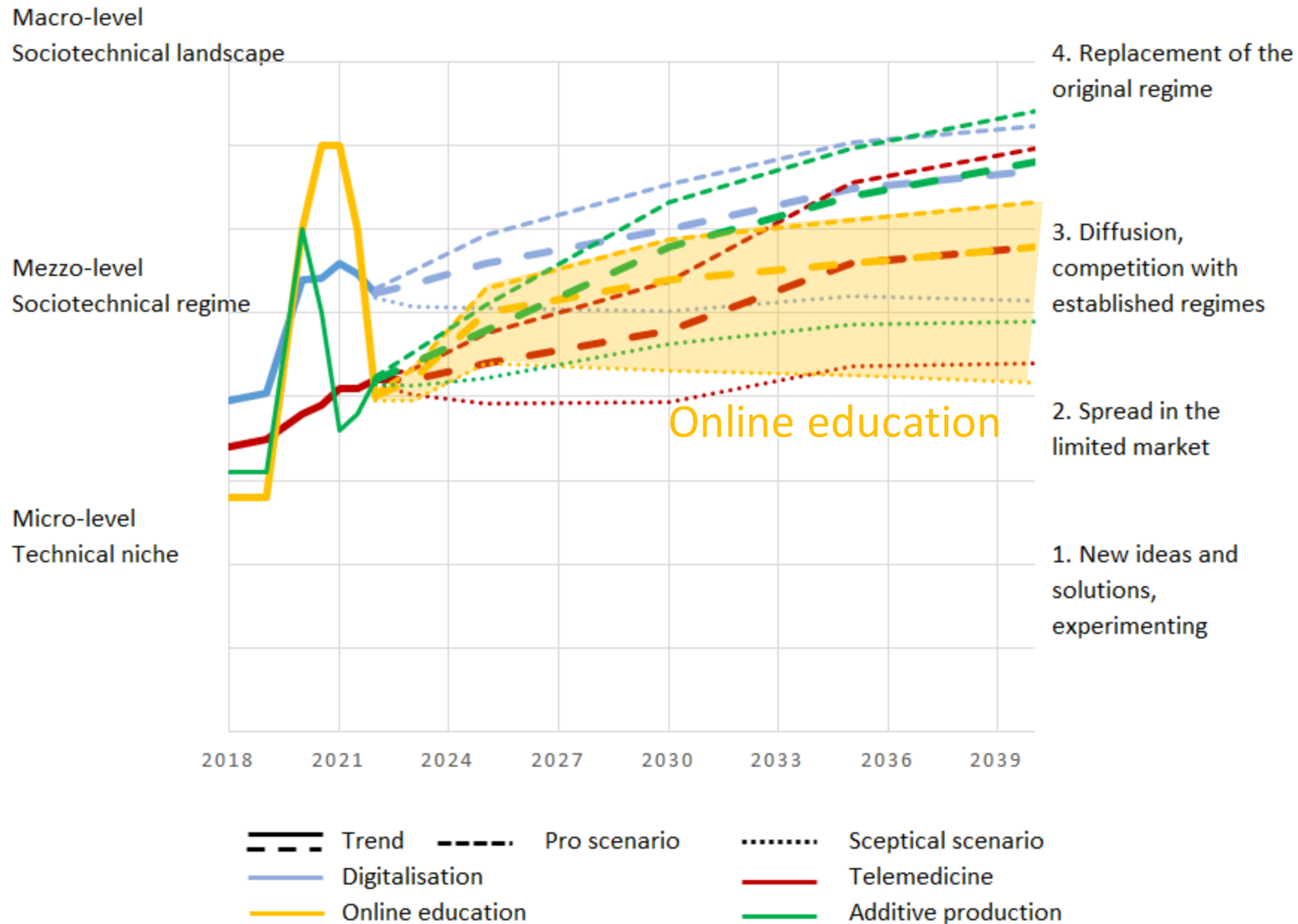
Micro-level  
Technical niche



### Factors

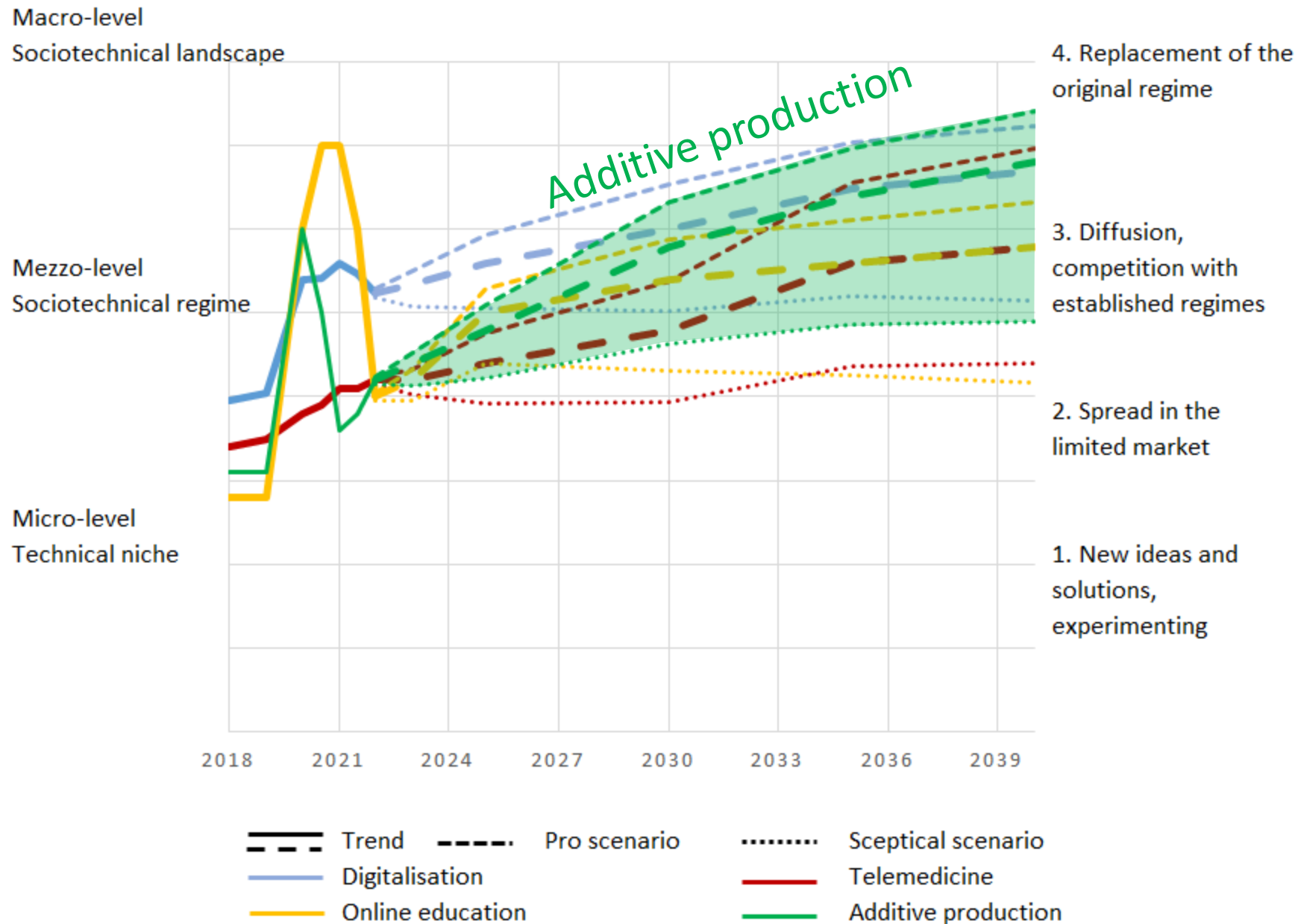
- Internet access and improving ICT literacy
- Increasing availability of telemedicine devices
  - Willingness to use them
  - Price
- Institutional aspect
  - Legal base,
  - (Care) Standards
  - Distribution of responsibilities





## Factors

- Improving ICT skills of teachers + standards
- Enhanced organizational and technical capacity of schools
- New pedagogical and didactical methods
- Improving computer literacy among the population
- General acceptance of
  - online education (legal, symbolic)
  - new roles and responsibilities of parents and students



## Factors

- Gradual standardisation of products and production (norms)
- Increasing share of certified materials
- Preference for local production in reaction to the disruption of global markets
- AddP gradually in curricula of professional high schools and technical universities

# Conclusions



- What boosts did provide the Covid 19 pandemic to the diffusion of the “digital” technologies [in the next 2 decades]?
  - † Breaking mental blocks, rapid learning about digital society, experiencing advantages
  - † Increased trust in digital means / media including online payments
  - † Households and firms realized the need for enhancing technical and human capacities
  - † Triggered or accelerated institutional changes (or at least a debate on them)
  - † Strengthened arguments for public support to (investment in) digitisation

# Conclusions



- The worries have concerned mainly the declines of social contacts (individualization, separation)
  - People felt fed up with doing everything online
- While the other threats of “digital society” rather suppressed
  - Cyber attacks, fake news
  - Digital divide
  - Advertisement and other practices breaking freedom of decisions
  - Stalking and similar
  - ...
  - “digitization saves time, but this will not be used for relaxing, instead it will accelerate our life [carousel]” ↗ hustle-bustle



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**Lenka Hebáková, Tomáš Rátínger**

hebakova@tc.cz; ratinger@tc.cz

<https://www.tc.cz/en> | <https://www.strast.cz/en>

[www.tc.cz](http://www.tc.cz)

# Chances and limits of distance learning from a pedagogical and social perspective

Dr. Mahshid Sotoudeh

5<sup>th</sup> ETAC, Karlsruhe/ Session

25<sup>th</sup> July 2022

## Innovation impulse by COVID-19 pandemic

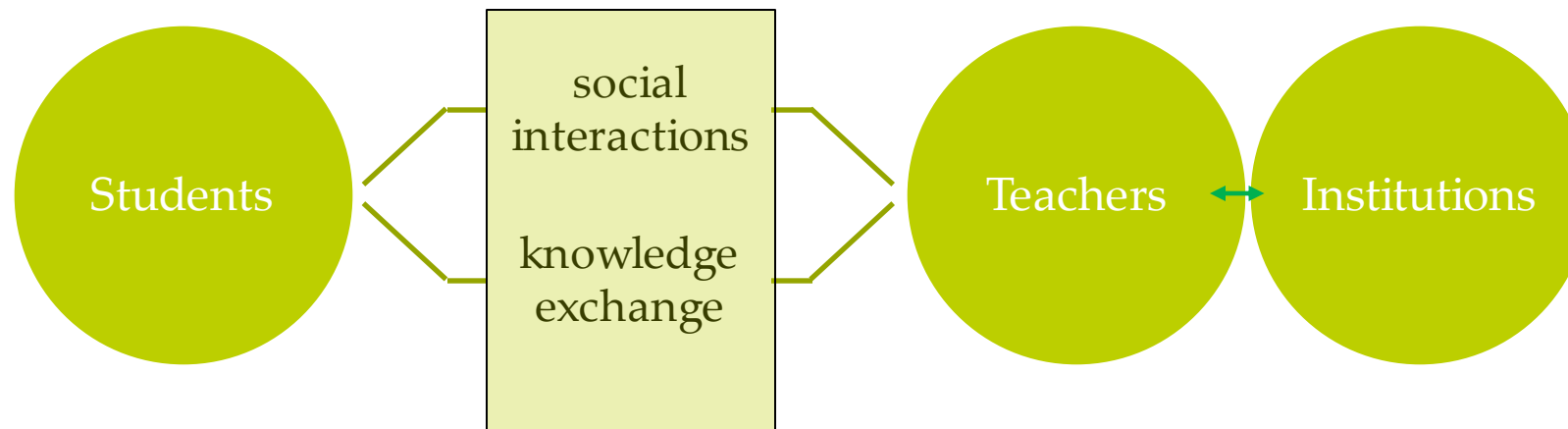
- Widespread Adoption of Hybrid Learning Models
- Increased Use of Learning Technologies
- Technical innovation in real learning experiments for *Emergency Remote Teaching (ERT)*
- Industry and administration report a rapid diffusion and a broad spectrum of applications for distance learning

Technology push meets demand pull

## Distance learning in higher education

Physical separation of teachers and students

The use of various technologies to facilitate communication

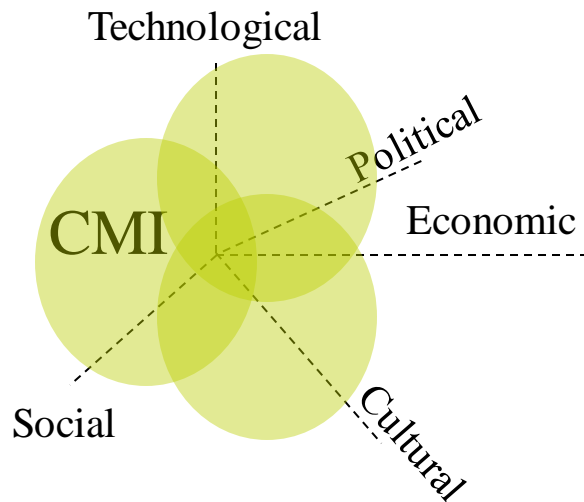


Various technologies  
Organisational changes

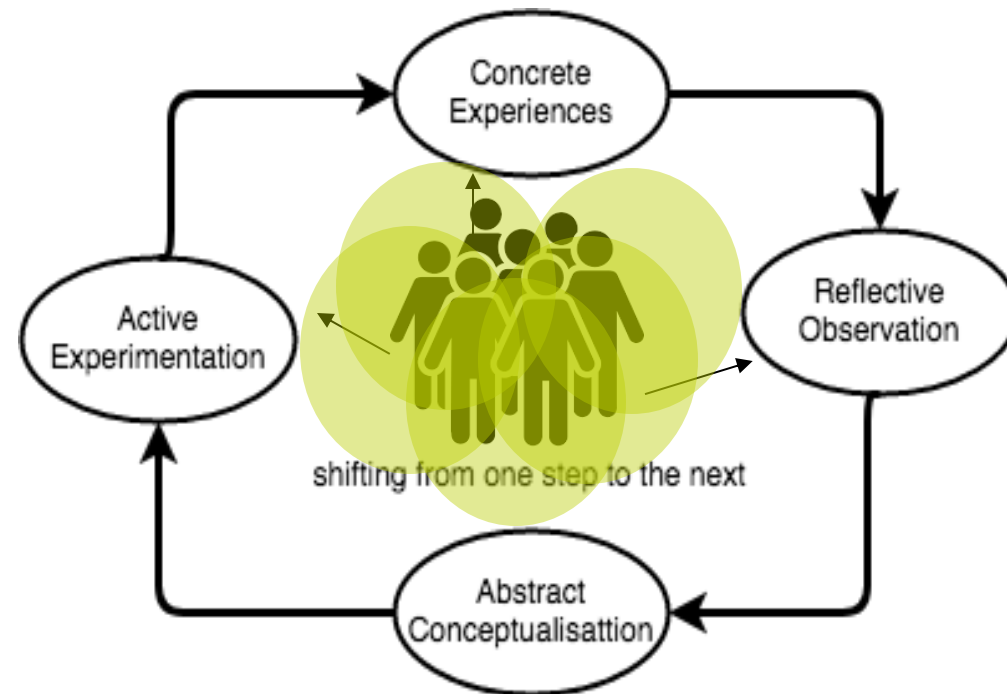


# Learning is more than communication of knowledge It requires a multidimensional human-centred process to co-create different types of knowledge

Teachers, Students and Administration



The Contextualized Multiple Intelligence  
(CMI, Cheng 2000)



Kolb's learning cycle Chiang et al. (2021)

## Key questions for shaping of distance Learning

- human-machine-human interactions  
(communication, learning, evaluation)
- Contents
- private-public collaborations (technical, organisational innovations)
- Multi-perspective analysis
  - Who is involved?
  - Which priorities are available?
  - Are there conflicts of different interests?

# Thank you for your attention!

Contact:


Dr. Mahshid Sotoudeh (she/her)

A-1010 Vienna, Bäckerstraße 13

T: +43 (1) 51581 6590

[msotoud@oeaw.ac.at](mailto:msotoud@oeaw.ac.at)

[oeaw.ac.at/en/ita](http://oeaw.ac.at/en/ita)

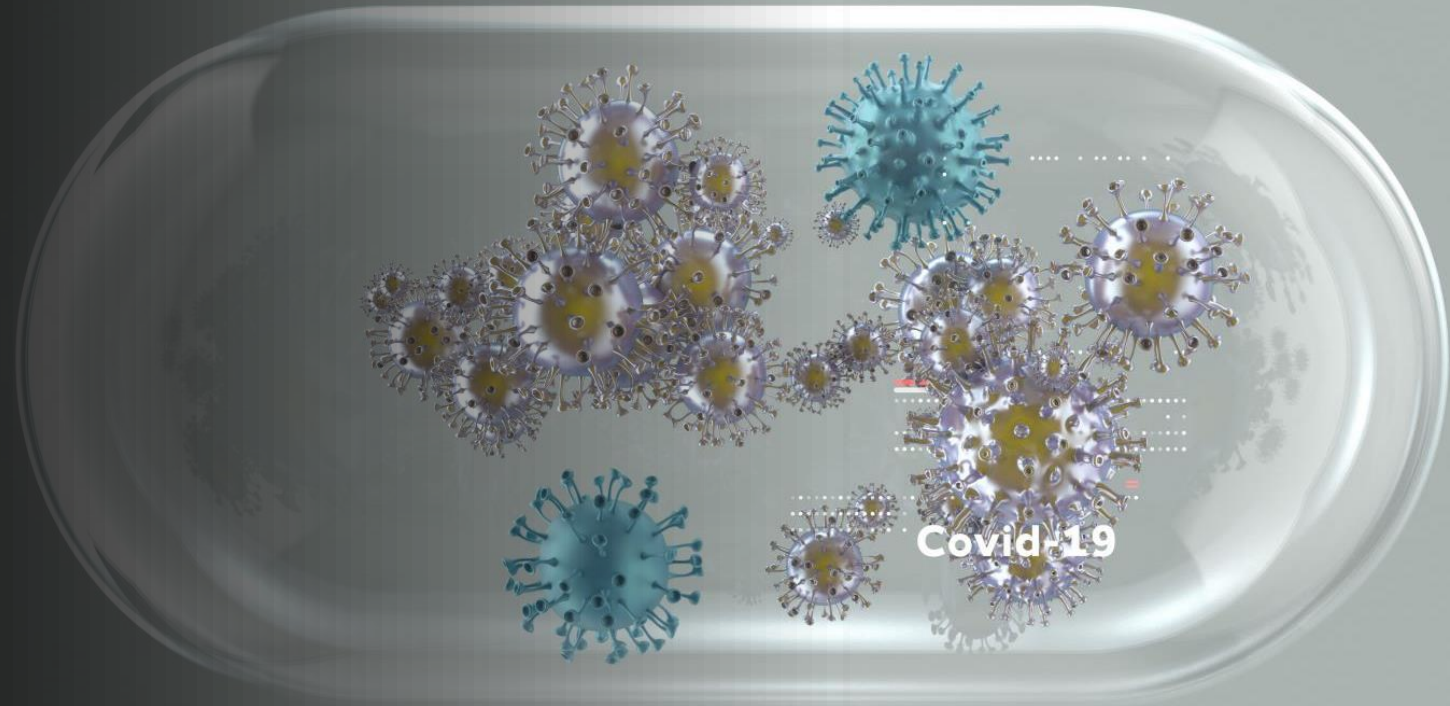


# Learning in post-pandemic: back to “normal” or back to better

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Arminas Varanauskas

5th ETAC, Karlsruhe, 25<sup>th</sup> of July  
2022



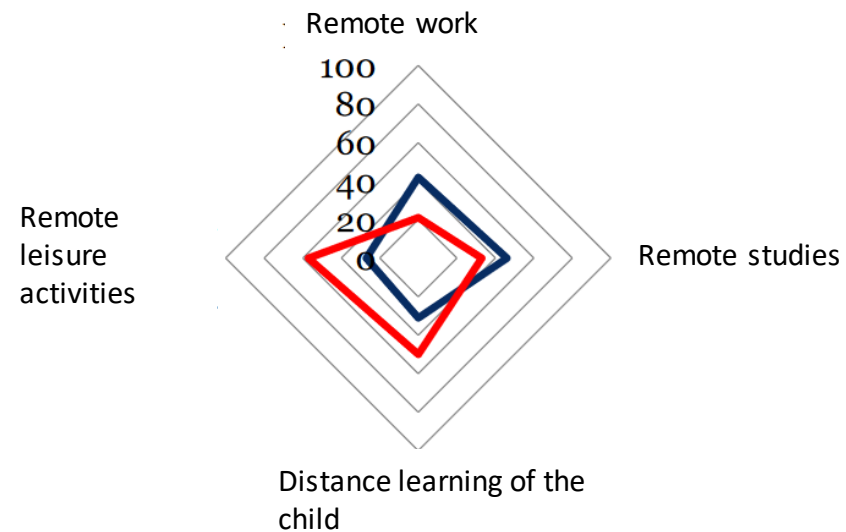
The background features several sets of concentric, curved lines in shades of grey and white, creating a sense of motion and depth. A prominent blue speech bubble shape is positioned on the left side, containing the main title.

## Special COVID related funding programme

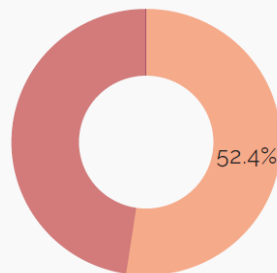
- Distance education of children during the COVID-19 pandemic: threats and opportunities from an ecosystem perspective (S-COV-20-11) + Children's health: Long term effects on children's physical and mental health (2020-2022) + Electronic media use and young children's health (2017-2018)
- Psychosocial stress responses to the COVID-19 pandemic and research-based coping recommendations (S-COV-20-12)
- Implications of COVID-19 for Public Safety: Threats and New Opportunities (S-COV-20-26)

# What should we continue doing online and what not?

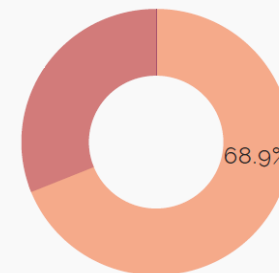
- Should continue online/remote after pandemic
- Online/remote is stressful



# Majority of youth experienced stress

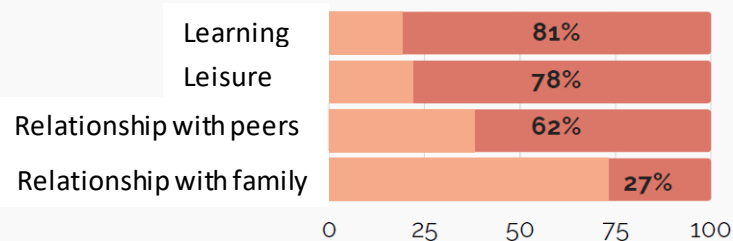


52.4% first year student feel stressed due to changes in study process



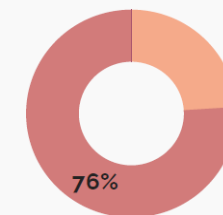
68.9% helps relatives with pandemic challenges

VU Psichotraumatologijos centro tyrimo duomenys



Areas of students' lives affected by pandemic

No difficulties Have difficulties



76% school students think that pandemic will have negative impact on their possibilities after the school

VU Psichotraumatologijos centro tyrimo duomenys

# Health problems

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Eyesight issues

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Obesity: 2016 – 5%; 2020 spring – 6.8%; 2021 autumn – 8.8%

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Headaches (11–14-year-old age group): 2018 – 37%; 2020 spring – 55%; 2021 autumn – 63%

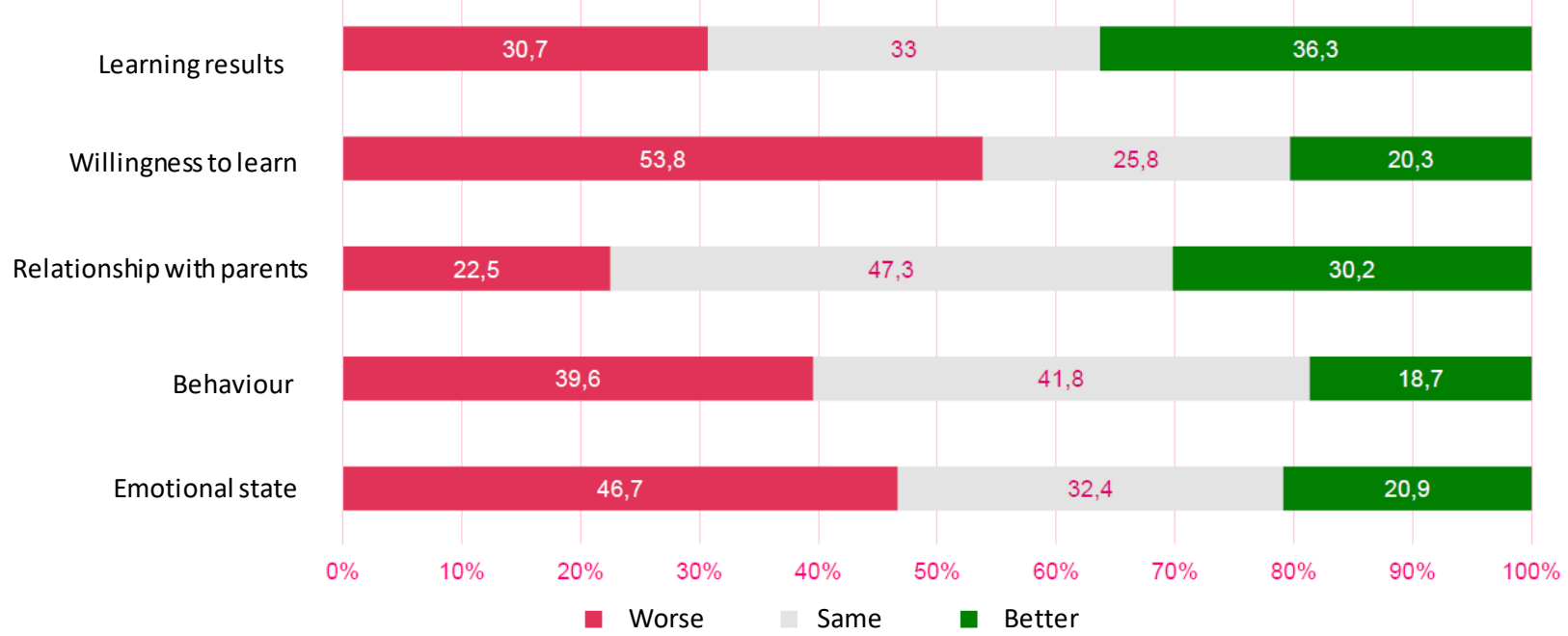


# Non-formal learning impact on young children (primary students)

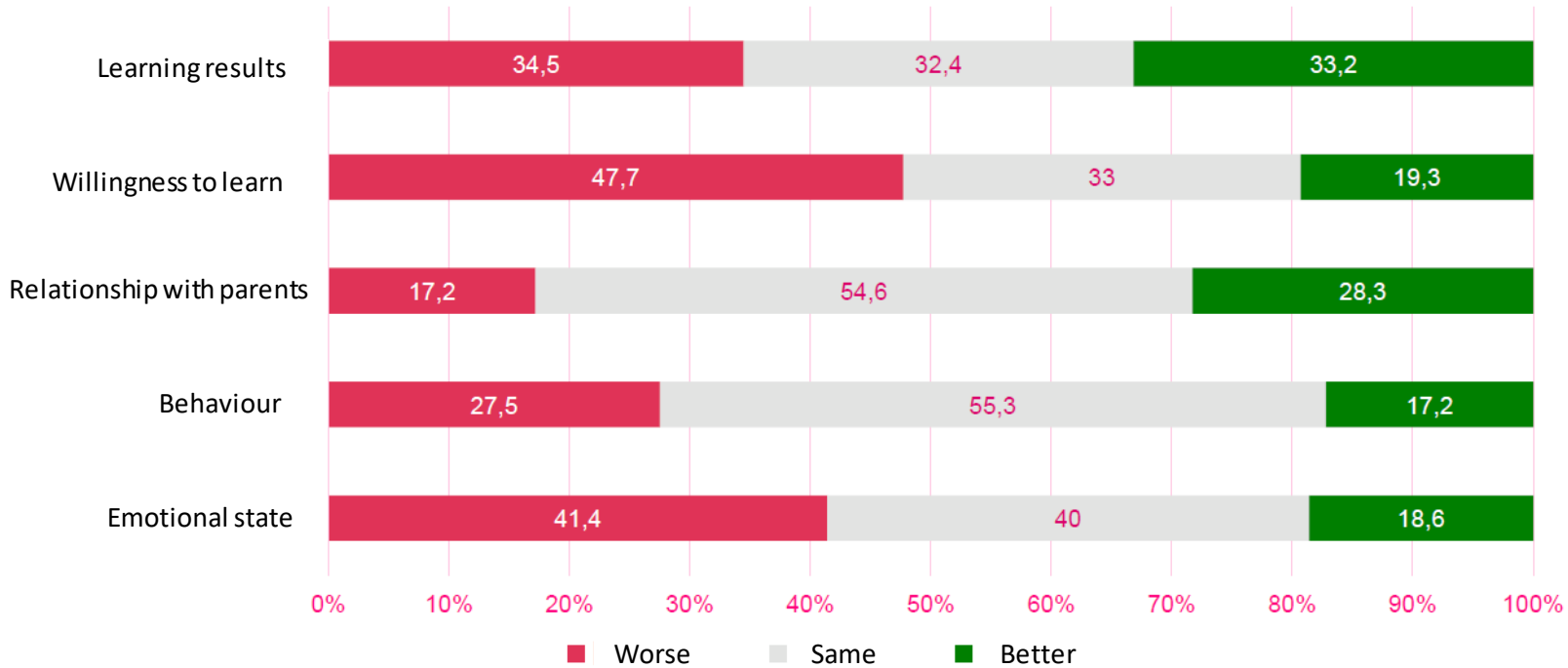
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- Those who enrolled f2f or remote:
  - spends less time on-screen for leisure
  - has better emotional feeling
  - better behaviour
  - higher willingness to learn
  - learning results are better
  - better relationship with parents
- Those who stopped go to non-formal during pandemics:
  - have highest number of nightmares
  - have highest numbers of somatic symptoms (stomach, head, eyes and other aches, constipation, diarrhea)

# First quarantine



# Second quarantine





Can technology help mitigate health risks associated with distance learning (both mental and physical)?

What policies needed to ensure that education adapts best practices in day-to-day activities?