



# Real Estate Education and the Fourth Industrial Revolution: Opportunities and Threats



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# Introduction

- What does Real Estate Education have to do with the 4<sup>th</sup> Industrial Revolution?
- Brief introduction
  - raise a few issues
  - More questions than answers
- Why do I talk about this?
  - Long term user of computers and the Internet (book 1993)
  - Involvement in university administration at WU
  - Involvement in academic associations (GfR, ERSA, ERES)
- What I will talk about
  - Industrial revolution (first to fourth)
  - Universities and higher education
  - Some ideas and examples (opportunities)
  - The new competition (threats)



# Industrial Revolution

- Technological, organizational and societal changes that fundamentally change products, production processes, power structures
- Set of radical innovations
- Need to diffuse through economy and society
- Process, not an event
- Faster and slower processes
- Conflicts with established structures (mode of production, business models, social groups and structures, political views and parties)
- Not every period of change and conflict is an “industrial revolution”

# Industrial revolution

- “Phases” and fundamental changes are much easier to identify in retrospect.
- 1<sup>st</sup> Industrial revolution (from mid 18<sup>th</sup> century):
  - man and horse power → water and steam power.
  - Workshops → factory
  - Capitalists – workers
- 2<sup>nd</sup> Industrial revolution (from mid 19<sup>th</sup> century):
  - Railway network
  - Electricity
  - Telegraph, telephone
  - Assembly line, automobile, mass production and mass consumption (scale economies)

# Industrial revolution

- 3<sup>rd</sup> Industrial revolution (from mid 20<sup>th</sup> century)
  - Electronics, transistor, bits and bytes, integrated circuits, digital storage, computer
  - Shift from atoms to bits
  - Digital products (software, music, pictures, films) are easy to store, copy, distribute, process into new digital products
  - Dramatic declines in costs and prices
- 4<sup>th</sup> Industrial revolution (21<sup>st</sup> century)
  - Networks, Internet, sensors, cloud storage, cloud computing, robotics
  - Machine to machine communication (standardized interfaces)
  - Customization
  - Knowledge economy

# Is there a 4<sup>th</sup> Industrial revolution?

- It does not really matter
- As long as we do not view it as a replacement
- Digitalization is continuing strongly
- Computer networks have a long history (ARPAnet: 1968)
  
- We are faced with
  - Continued digitalization of products and (production and consumption) processes
  - A global network connecting computers and allowing them to communicate
  - A huge number of digital end products (smartphones, laptops, tablets), all capable of two-way communication
  - Continuously growing content
  - Huge collections of data in cloud storages
  - Dramatically declining prices (computing power, storage, access, printing)



# Universities and digitalization

- Research: academic institutions are drivers of digitalization
  - Many essential innovations came from them (ARPAnet, HTTP + HTML)
  - Development of open source software and respective tools and institutions
  - Collective software development, maintenance, and support
  - Today there exist open source options for all major types of software
- Open access publishing (diamond! – no APCs)
  - Developed and promoted by academics and universities
  - Wider circulation of research results, no paywall
  - More citations
  - No commercial interests

# Relevance for higher education?

- Higher education is part of the knowledge economy
  - Universities and academic associations (like ERES) are important institutions of this sector
- Long tradition (859: Fez, 970: Kairo, 1088: Bologna, ...)
- Surprisingly constant mode of operation:
  - bring together students and lecturers for face-to-face interaction

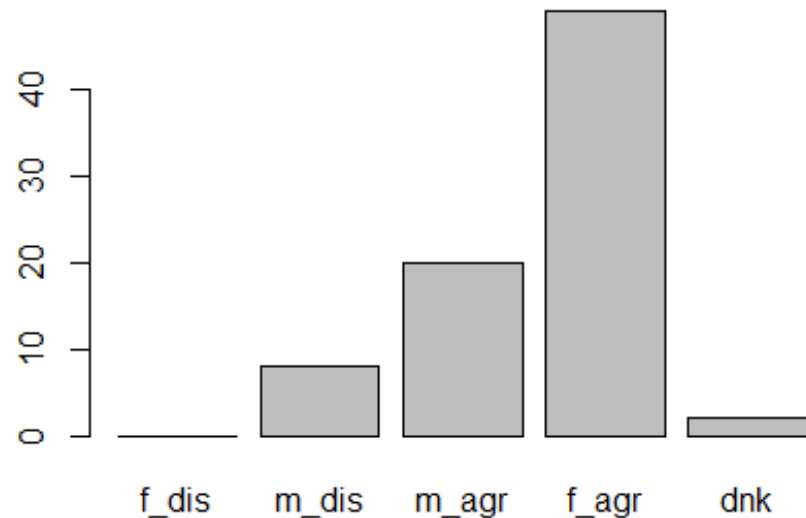
Giovanni d'Andrea lecturing at the University of Bologna, 1348 (Medieval Civic Museum, Bologna, Italy)





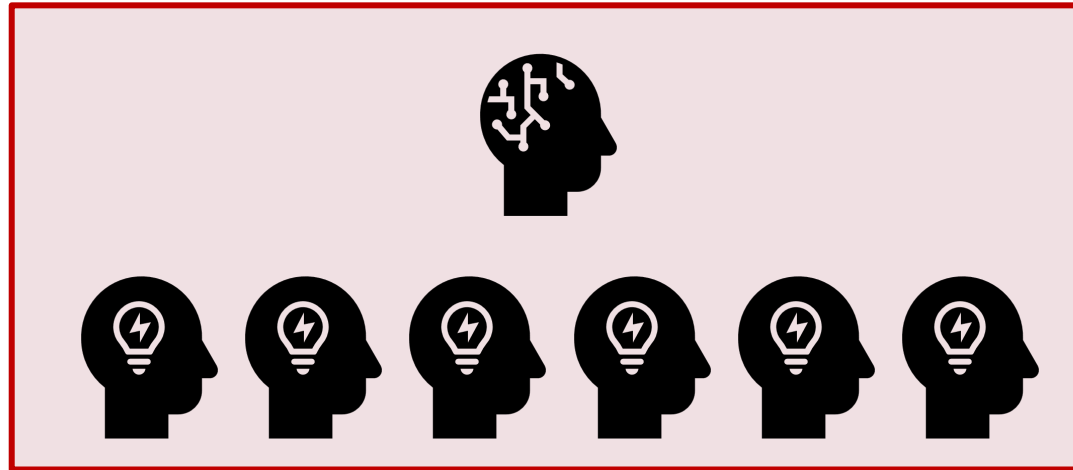
# Teaching during the pandemic

- **Also in the future, direct face-to-face contact will be essential for good teaching**
  - 87.3% agree; 62% fully, 25.3% mainly



Gunther Maier, Sabine Sedlacek (2022)  
Real estate teaching and research in  
times of COVID-19 - The faculty's view.  
Presentation at ERES 2022, Milano,  
Italy.

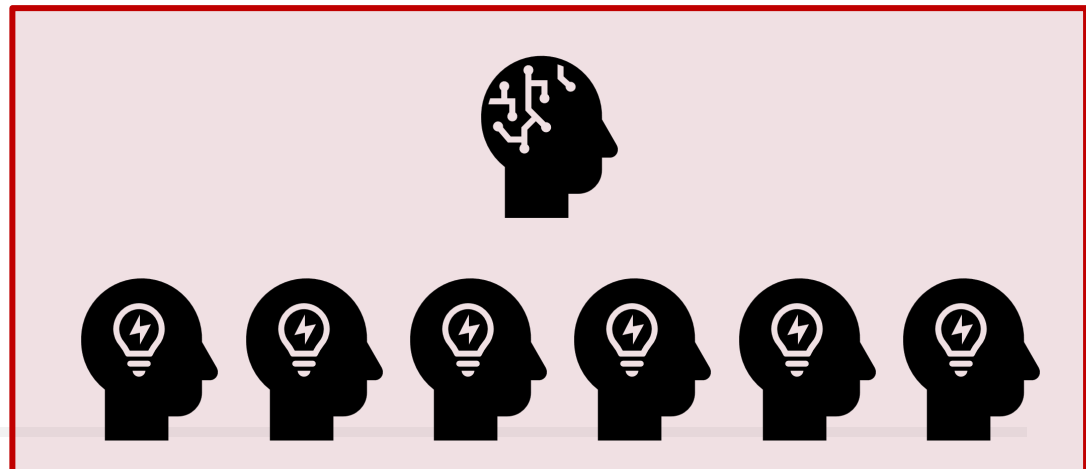
# The (traditional) teaching setup



- Required and suggested readings (from library or bookstore)
- Within the classroom (flipped or not)
- Students learn from the lecturer and from each other
- Lectures, group work, trial and error, implicit evaluation

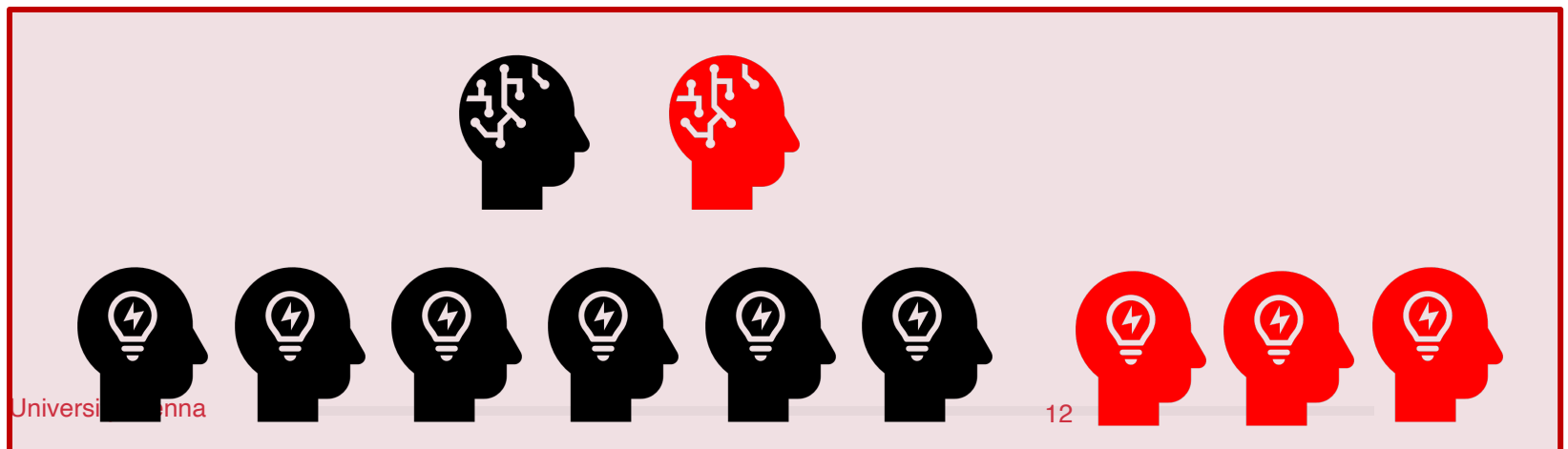
# Real estate education & ERES: Opportunities

- All ideas are meant to be open to the outside world (incl. industry)
- Digital Textbooks
  - Free digital versions, open source management software, no copyright issues through proper licensing, cheap printed versions through book on demand (no inventory, very low fixed costs)
- Textbooks as “digital notebooks”
  - Digital notebooks are documents that include text and code (in Python, R, Julia)
  - Allow the reader to run the embedded code, adjust it, copy it, etc.



# Real estate education & ERES: Opportunities

- Network of experts (academic or industry) for virtual classroom inclusion
  - Self declaration, quality control (through feedback or through description)
  - Reputational benefit for the individual, visibility
- Linking classes
  - Related topics, joint presentations
  - Seminar groups across institutions
  - “virtual student exchange”



# Real estate education & ERES: Opportunities

- “Basic Real Estate” videos
  - A series of videos explaining basic terms and concepts of real estate
  - “Real Estate”, “RE Development”, “RE Management”, “Leverage effect”, ...
  - For students, practitioners, new faculty members
  - Shows competence, contrasts “how to make money” videos
- “Virtual tours through buildings”, “Virtual tour excursions”
  - E.g., green buildings, iconic buildings, urban infrastructure
  - Linked with text, pictures, videos, web-links
  - Repository of publicly accessible tours, linking tours to virtual excursions
  - Needed: 360 degree camera, software (freeware: Marzipano)
  - Viewing: standard web-browser



# Digitalization and new competition: Threats

- With the available technologies (digital cameras, smartphones, free software) everybody can produce content for knowledge transfer
- With the available cloud storage, everybody can make the content globally available (YouTube, Google Docs, Microsoft, Sharing platforms)
- Offer specific information, courses, degree programs, certificates
- Cloud companies (and large publishers) can (mis)use the material
- Network externalities may replace academic institutions



# Digitalization and new competition: Threats

- Cooperate or compete?
- Institutions cannot leave it to the individuals – institutional policy is required
  
- Sharing of
  - Course descriptions
  - Reading lists
  - Slides
  - Texts
- Production of
  - Videos
  - Virtual tours
  - Textbooks
  
- Developing
  - YouTube “Star”
  - Virtual “Nobel laureates”
  - Institutional presence
  - Modern image
- Risk of
  - Exploitation by commercial providers
  - Commercial interests
  - Example of publishing!

# Digitalization and new competition: Threats

- Quality control – certification
  - academic institutions as independent trusted third party
  - Business opportunity for academic institutions?
- Choice between
  - Naively feeding the competition
  - Naively ignoring new developments and the new competition
- Institutions need to define standards and guidelines
- Do academic institutions have to build their own infrastructure?
  - Repositories, public archives, social media infrastructure
  - Learn from experience in academic publishing



# Conclusions

- Digitalization, fourth industrial revolution, etc. are of high relevance for higher education
  - Universities
  - Academic societies like ERES
  - Teaching (and research, third mission, administration)
- Opportunities
  - Utilize the network of lecturers and researchers
  - Identify opportunities, encourage community to use them
  - Develop infrastructure for sharing and exchange (knowledge, expertise, concepts, instruments, ...) with an open science perspective
- Threats
  - New market entrants (cloud storage providers, exchange platforms)
  - Risk of feeding the competitor
  - Institutional strategies are required

Thank you for your attention

