Fachhochschule des Mittelstands

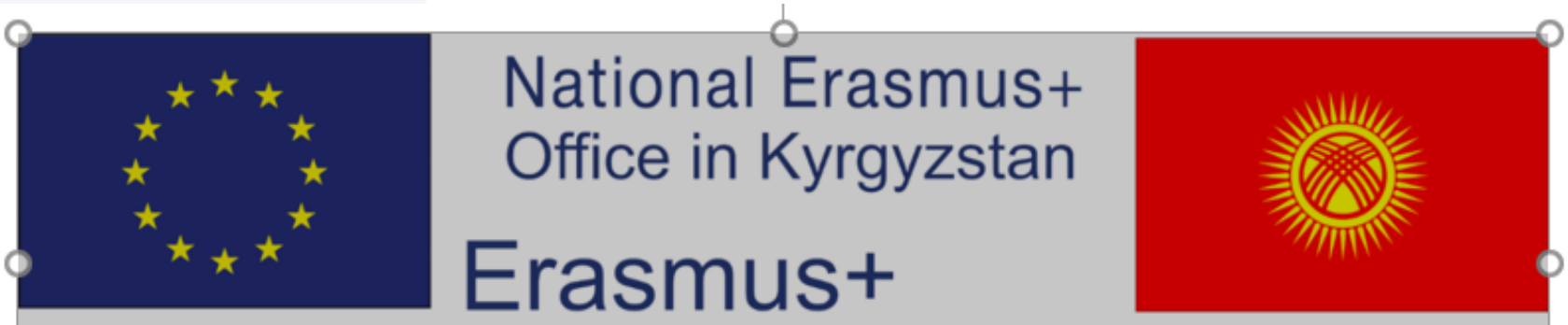
Future Skills:
How Universities can prepare for Jobs don‘t yet exist

Online Seminar Kyrgyzstan
12.12.2025

The Future of Work and Education: Trends, Uncertainty, and Readiness

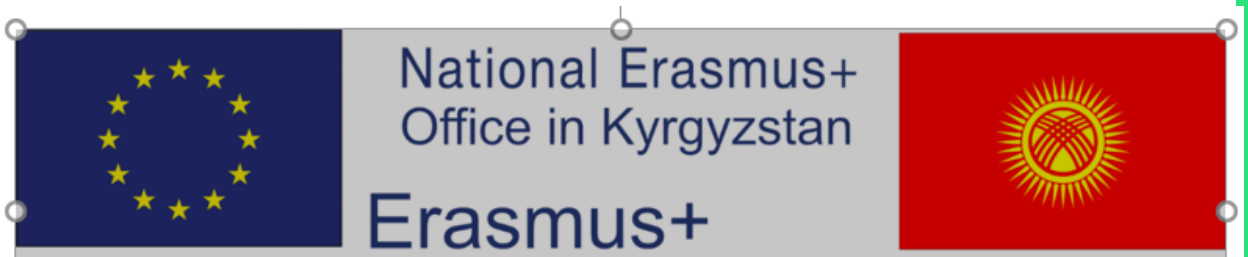
- **Global shifts in the labour market and regional specificities**
- **Disruptive technologies and implications for universities**

Prof. Dr. Rulf J. Treidel



Future of Work - Introduction

1. Why the future of work and education is changing?
2. Global shifts in labour markets and skills demand
3. 21st Century Competencies
4. Innovation in Higher Education
5. University Readiness
6. Outlook

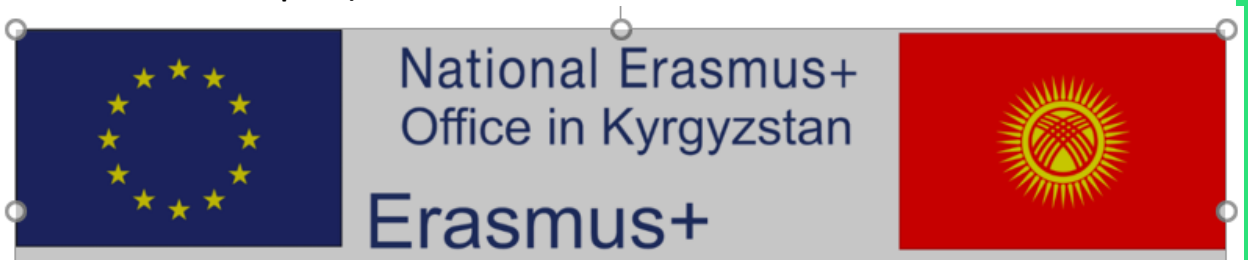


Future of Work - Introduction

“Education is no longer about teaching students something alone; it is more important to be teaching them to develop a reliable compass and the navigation tools to find their own way in a world that is increasingly complex, volatile and uncertain. Our imagination, awareness, knowledge, skills and, most important, our common values, intellectual and moral maturity, and sense of responsibility is what will guide us for the world to become a better place”

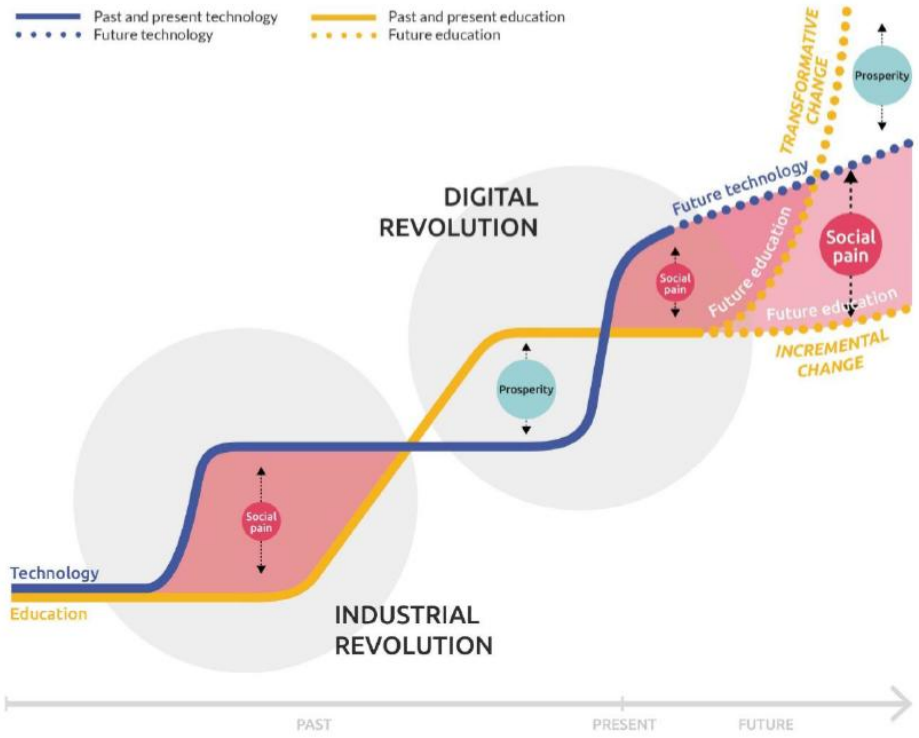
Andreas Schleicher, Director of the OECD Directorate for Education and Skills.

(OECD FUTURE OF EDUCATION AND SKILLS 2030, OECD 2019, p. 5)



Future of Work - Introduction

Figure 2. The race between technology and education

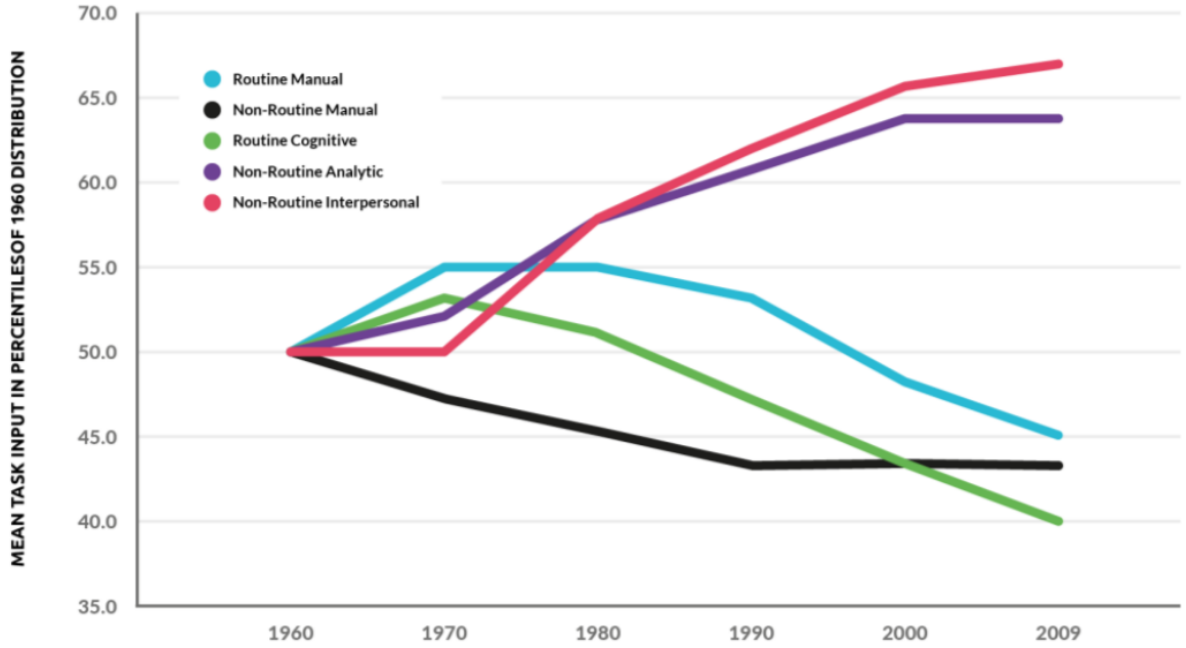


Source: Inspired by "The race between technology and education", Goldin and Katz (2010[2]).

OECD FUTURE OF EDUCATION AND SKILLS 2030, OECD 2019, p. 7

Future of Work - Introduction

Figure 3. Change since 1960 in prevalence of types of tasks required for work



Note: This figure shows how the task composition performed by US workers has changed from 1960 to 2009.
Source: Autor and Price (2013) in Bialik and Fadel (2018[7]), p.7.

OECD FUTURE OF EDUCATION AND SKILLS 2030, OECD 2019, p. 7

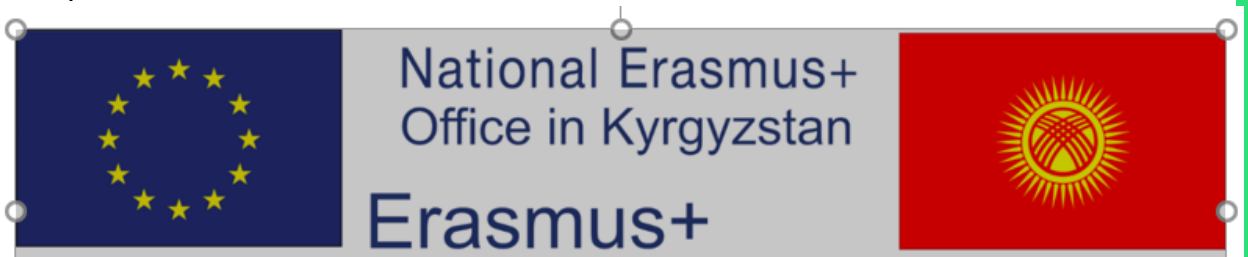
Future of Work - Introduction

OECD launched the Future of Education and Skills 2030 project in 2015

Aim to help countries prepare their education systems for the future

- **First Phase (2015-19)**, on “what” questions – what kinds of competencies (knowledge, skills, attitudes and values) today’s students need to thrive in and shape the future for better lives and for individual and societal well-being
- **Second Phase (2019 and beyond)**, on “how” questions – how to design learning environments that can nurture such competencies, i.e. how to implement curricula effectively.

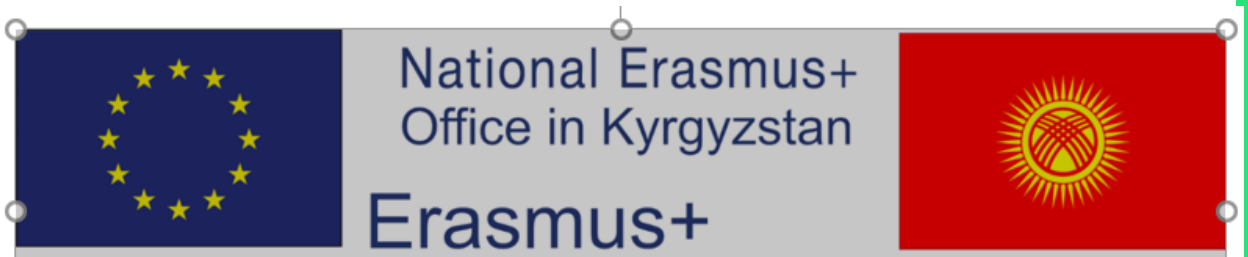
OECD FUTURE OF EDUCATION AND SKILLS 2030, OECD 2019, p. 7



1. Why the future of work and education is changing

Global Megatrends

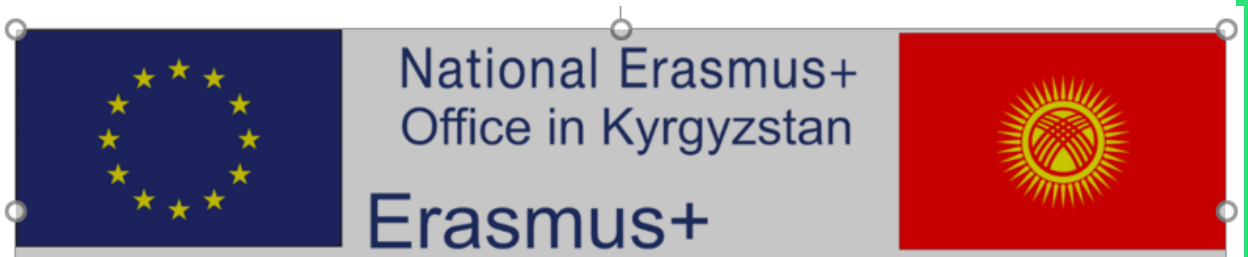
- Demographic change, urbanization, climate crisis, digitalization, geopolitics
- Trends interact and amplify each other – creating uncertainty and non-linear change
- UNESCO: “No trend is destiny” – policy and education can still shape outcomes (UNESCO, Reimaging our Future together, 2021, S. 1)



1. Why the future of work and education is changing

Demographic Shifts

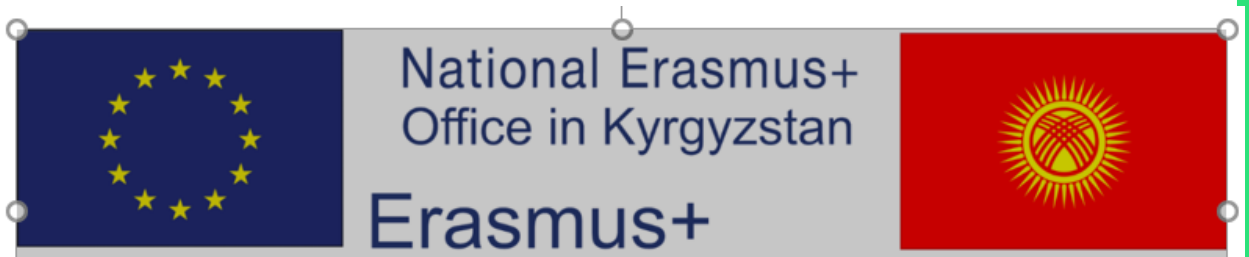
- Ageing populations in many OECD countries – pressure on pensions and health systems
- Youth bulges in parts of Africa and Central Asia – risk of unemployment or brain drain
- Migration and mobility reshaping talent flows and higher education enrolment



1. Why the future of work and education is changing

Urbanization Patterns

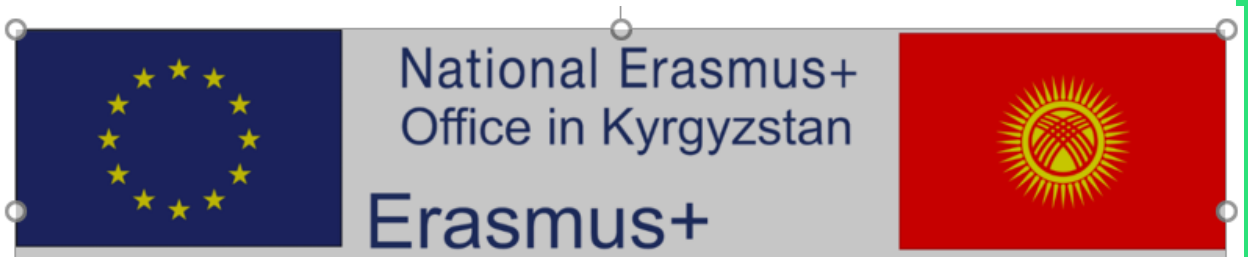
- Over half of the world's population now lives in cities – share still increasing
- Growth of secondary cities and digital connectivity – "multi-campus" learning spaces
- Implications: demand for urban skills, planning, smart city and infrastructure expertise



1. Why the future of work and education is changing

Globalization 2.0

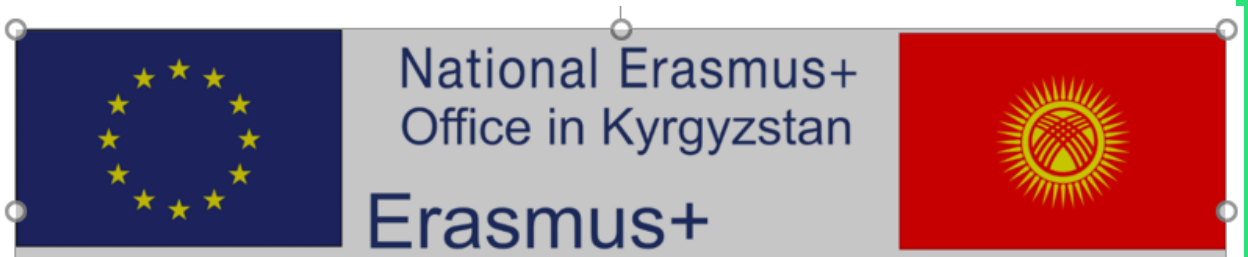
- Shift from trade in goods to trade in services, data and ideas
- Regional blocs, “friend-shoring” and supply-chain reconfiguration
- Global competition for talent – remote work expands labour markets beyond borders



1. Why the future of work and education is changing

Geopolitical Uncertainty

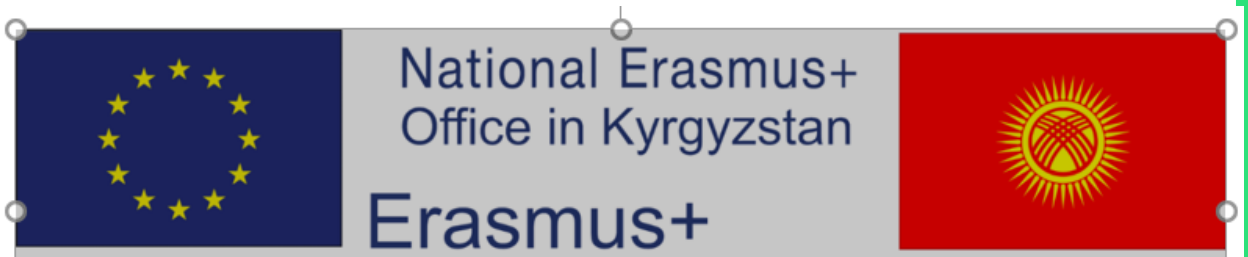
- Polycrisis: pandemics, wars, debt crises and political polarisation
- Shocks influence quickly finance, energy and food systems
- Universities need scenario planning, risk literacy and resilience as core capacities



1. Why the future of work and education is changing

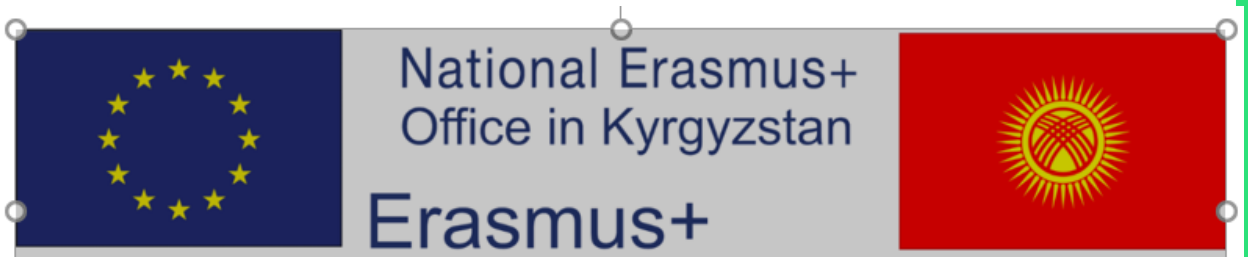
Climate Change & Green Transition

- Climate change already affecting livelihoods, productivity and migration
- Net-zero and green transition creating new sectors and “green skills” demand
- ILO and OECD highlight need for just transition and reskilling in carbon-intensive regions



2. Global Shifts in Labour Market

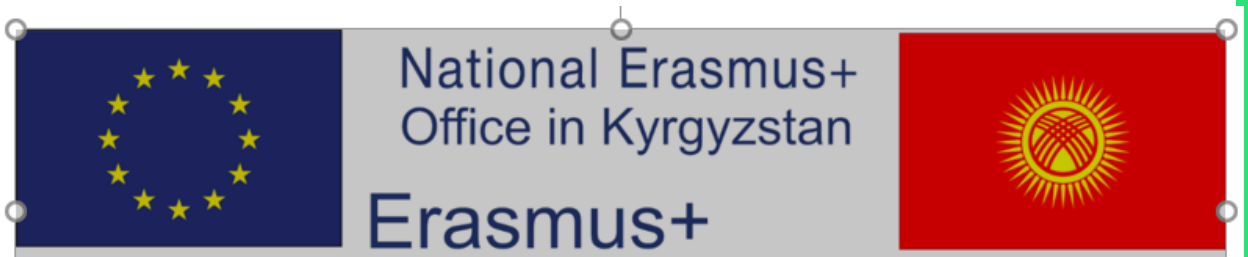
- Long-term shift from agriculture and manufacturing to services and knowledge work
- Rise of care, health, education and digital services – especially in urban areas
- ILO: decent work agenda emphasises job quality, security and social protection



2. Global Shifts in Labour Market

Skills Polarization

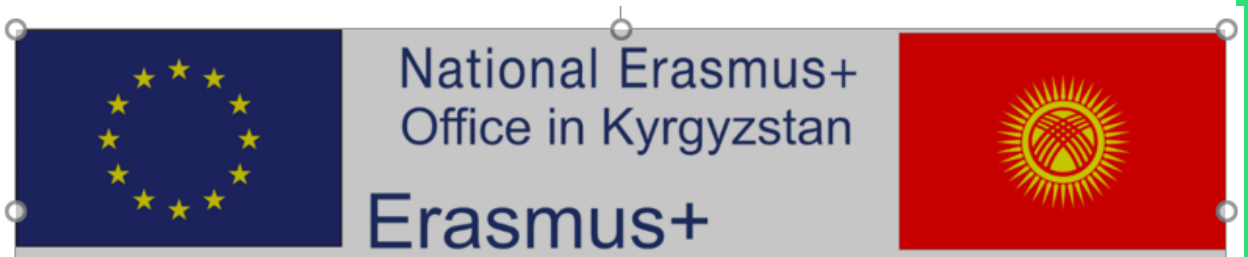
- Routine, middle-skill jobs most exposed to automation and offshoring
- Growth at the top (high-skill, knowledge-intensive) and bottom (low-wage services)
- Risk: widening wage inequality and social fragmentation without active skills policies



2. Global Shifts in Labour Market

Gig & Platform Economy

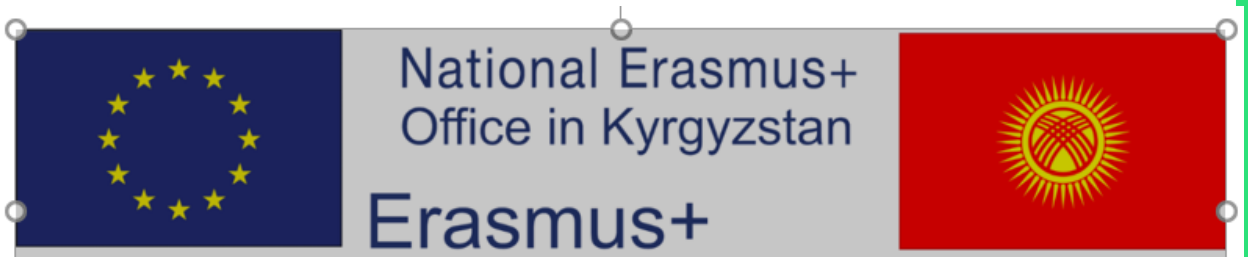
- Platform work expanding in transport, care, freelancing and online micro-tasks
- ETF and ILO show rising platform work in Central Asia, especially among youth
  - Challenges: precarity, algorithmic management;
  - opportunities: flexibility, entry to labour market



2. Global Shifts in Labour Market

Remote & Hybrid Work Models

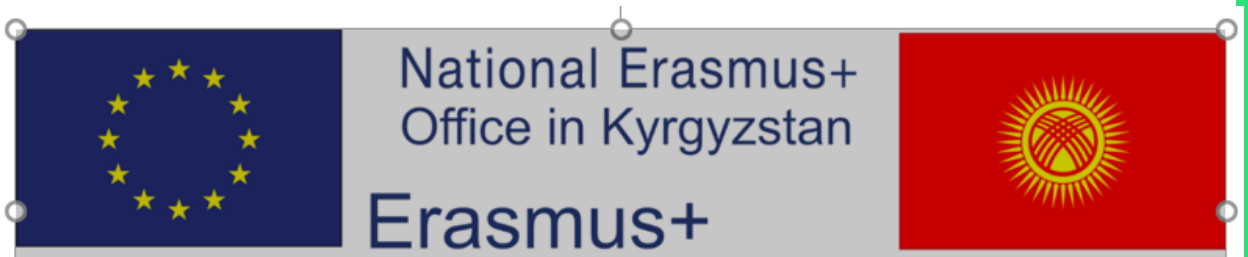
- COVID-19 accelerated remote and hybrid work in knowledge-intensive sectors
- Global talent pools: firms can hire across borders; workers compete globally
- Implications for graduates: digital collaboration, self-management and cross-cultural skills



2. Global Shifts in Labour Market

Automation Trends

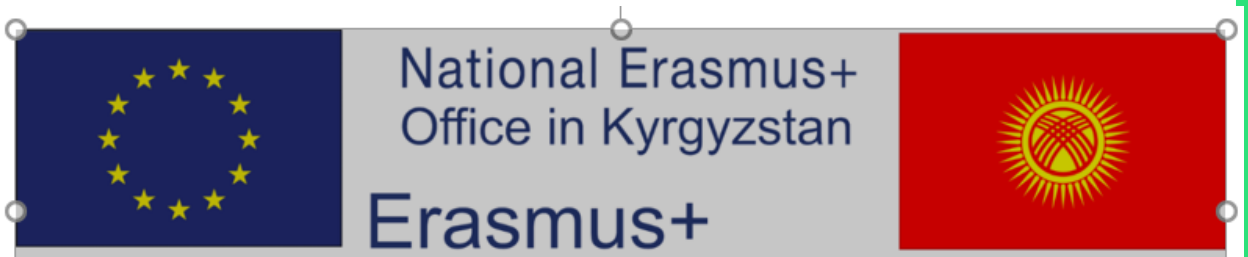
- Robotics and software automation replacing routine manual and cognitive tasks
- OECD: ~9–27% of jobs automatable or at high risk across member countries
- New jobs emerge in design, maintenance, data and human-centred roles



2. Global Shifts in Labour Market

AI & Machine Learning

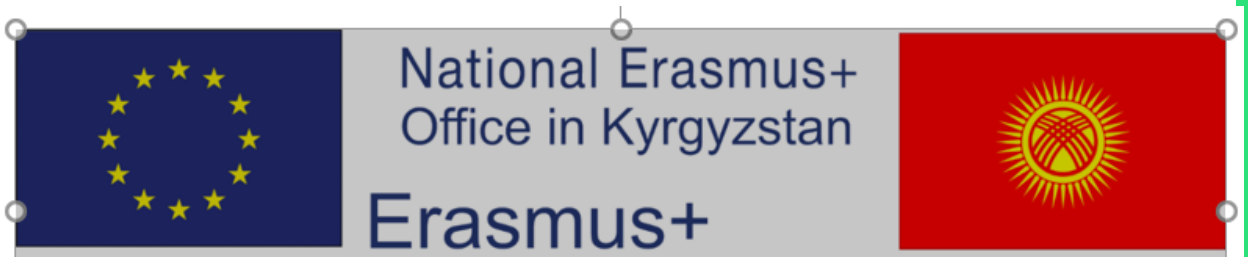
- Automation Trends Generative AI can now produce text, code, images and even scientific drafts
- WEF: employers expect ~39% of core skills to change by 2030 due to AI and other trends
- AI is a general-purpose technology – transforming most disciplines and professions



2. Global Shifts in Labour Market

Robotics & Industrie 4.0

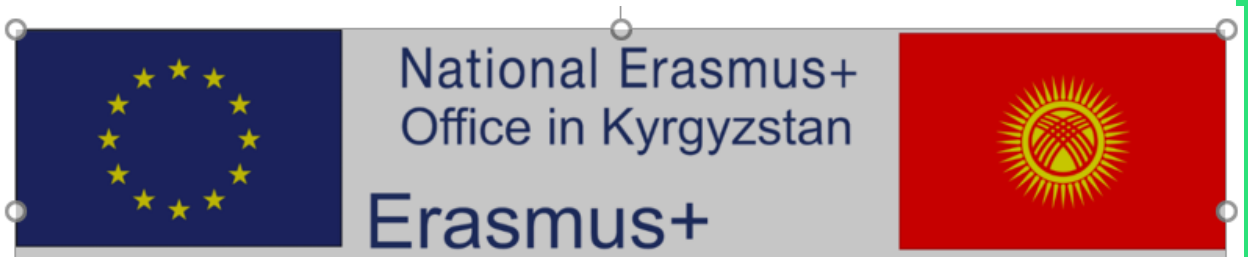
- Cyber-physical systems and advanced robotics in manufacturing and logistics
- Smart factories demand data, systems and process engineers, not only operators
- Universities must connect engineering, computer science and management education



2. Global Shifts in Labour Market

Digital Platforms

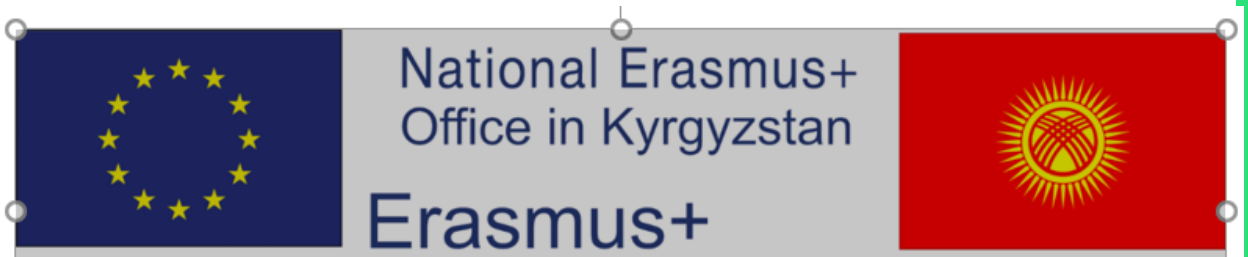
- Platforms organise markets (work, learning, finance, mobility, entertainment)
- Winner-takes-most dynamics: a few platforms coordinate global ecosystems
- Graduates need platform literacy: understanding algorithms, data and governance



3. 21st Century Competencies

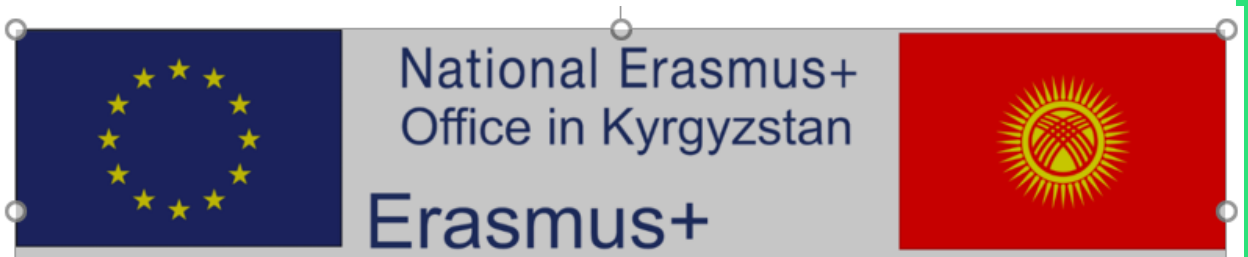
Future Skills

- Combination of technical, cognitive, social-emotional and meta-learning skills
- WEF and OECD: problem-solving, critical thinking, creativity, collaboration remain central
- Transversal skills enable workers to move between occupations and sectors over a lifetime



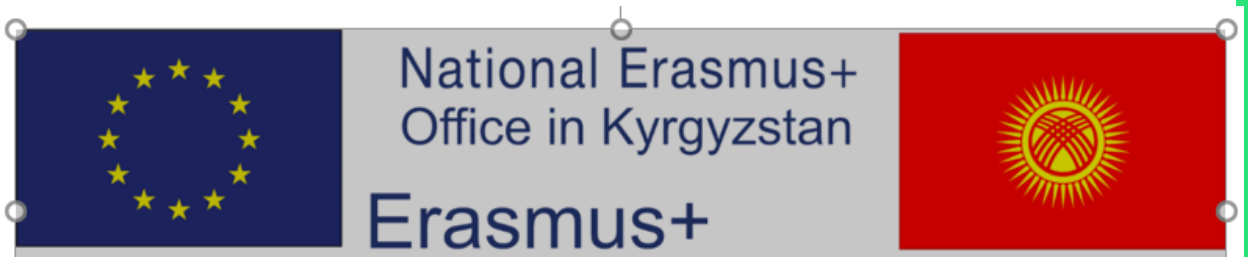
3. 21st Century Competencies

- Learning Compass 2030: knowledge, skills, attitudes and values for well-being
- Competencies: creating new value, reconciling tensions and taking responsibility
- Emphasis on agency – learners shaping their own and collective futures



Digital Literacy

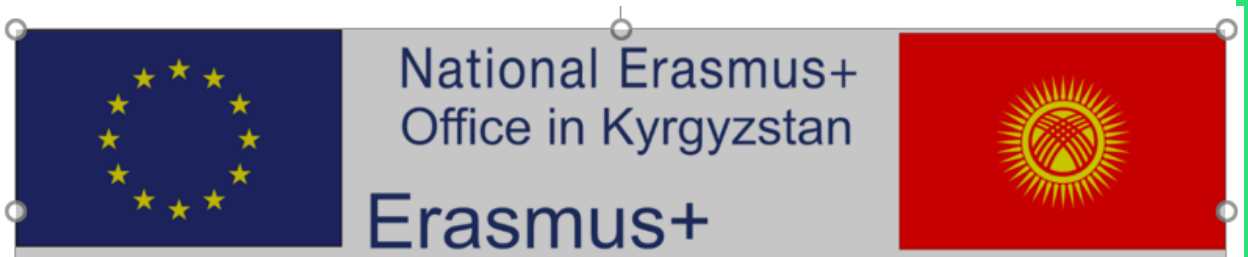
- Beyond basic ICT skills: understanding data, platforms, cybersecurity and digital rights
- Ability to evaluate information and counter mis- and disinformation
- For universities: integrate digital literacy across disciplines, not only in CS programmes



3. 21st Century Competencies

AI Literacy

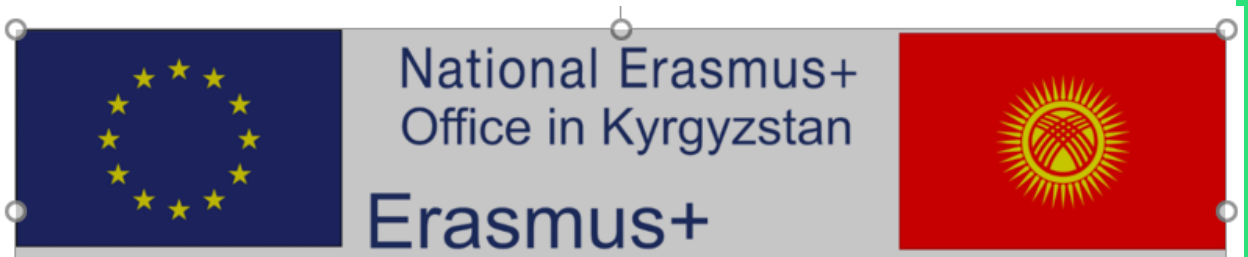
- Understanding what AI can and cannot do; limits, biases and ethical issues
- Prompting, evaluating AI output and using AI as a partner, not a crutch
- Responsible AI education: fairness, transparency, accountability and human oversight



3. 21st Century Competencies

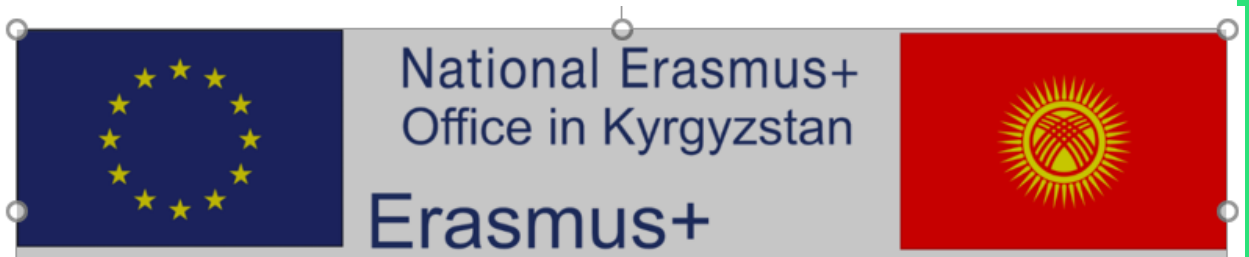
Human Machine Cooperation

- Most jobs will be reconfigured rather than simply replaced by machines
- Humans focus on sense-making, ethics, empathy, creativity and complex coordination
- Design curricula around human strengths in an AI-rich environment



4. Innovation in Higher Education

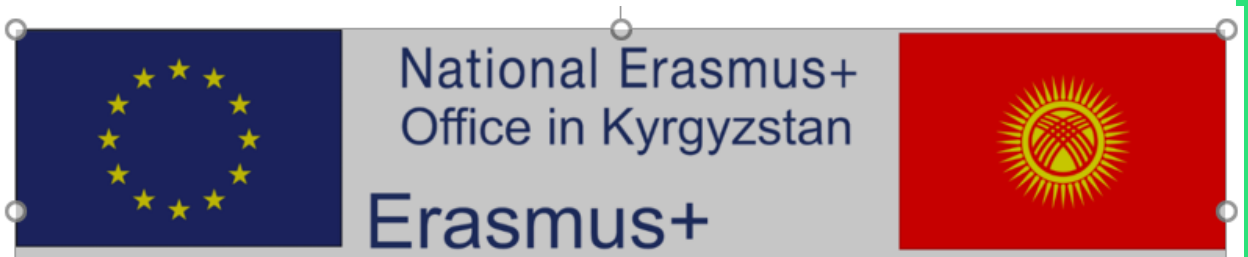
- UNESCO Futures of Education: universities as laboratories for new social contracts
- Shift from knowledge transmission to knowledge co-creation with students and society
- Need for agile governance, experimentation and partnerships with ecosystems



4. Innovation in Higher Education

Micro Credentials

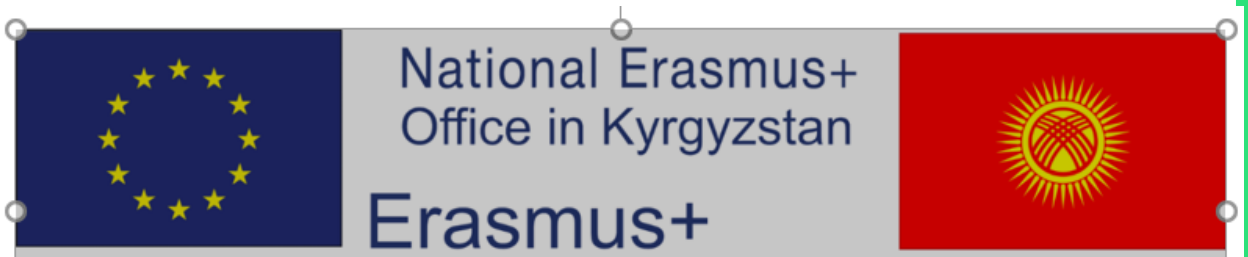
- Short, targeted learning offerings recognised with digital badges or certificates
- Support modular upskilling and reskilling throughout the life course
- Universities can partner with industry to co-design and co-brand microcredentials



4. Innovation in Higher Education

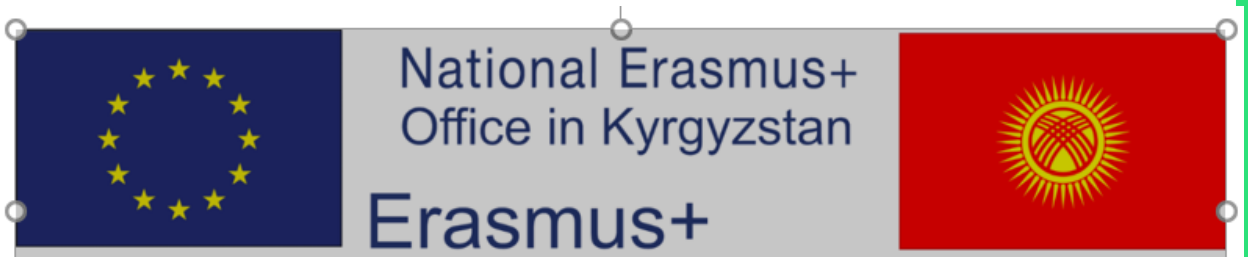
Life Long Learning Models

- Career paths are less linear – workers need recurrent opportunities to learn
- From “front-loaded” education to “learning throughout life”
- Requires flexible admissions, recognition of prior learning and new funding models



Competency-Based Education

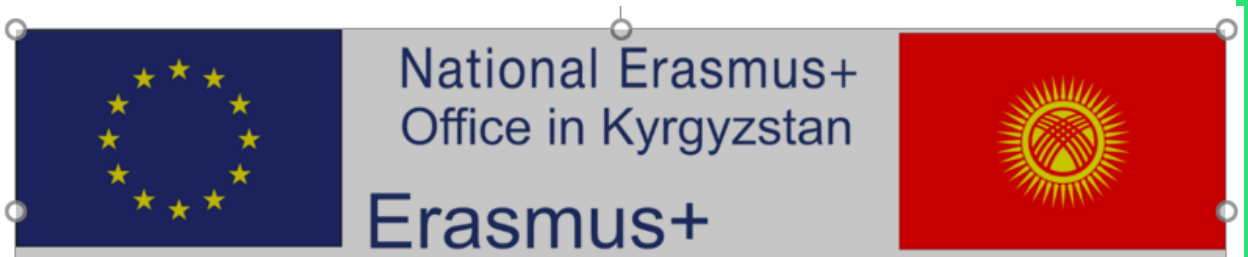
- Progress based on demonstrated competencies, not seat time or credits alone
- Clear learning outcomes aligned with labour market and societal needs
- Assessment emphasising performance tasks, portfolios and real-world projects



4. Innovation in Higher Education

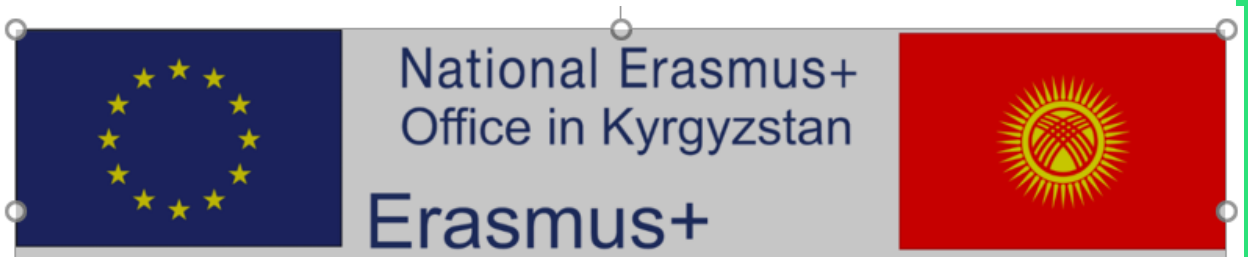
Personalized Learning

- Use of data and AI to tailor learning pathways, pacing and feedback
- Balance between personalisation and collective, social learning experiences
- Risks: privacy, bias, over-optimisation; need for human-centred learning design



Blended & Online Education

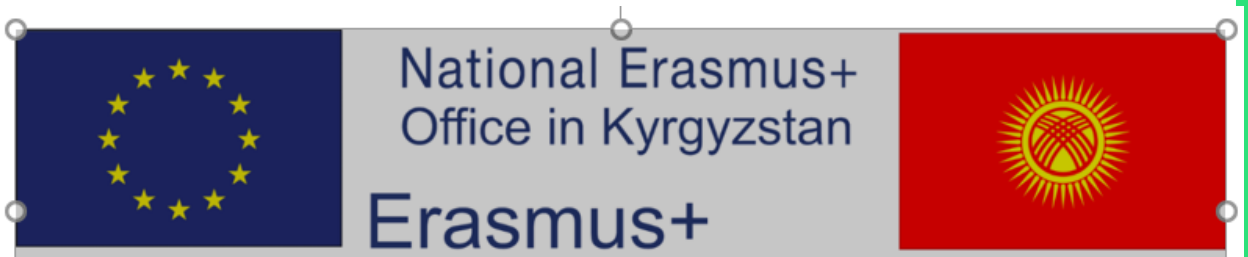
- Blended models combine the strengths of online and face-to-face modalities
- Online learning expands access, especially in remote or rural regions
- Quality requires instructional design, student support and robust digital infrastructure



4. Innovation in Higher Education

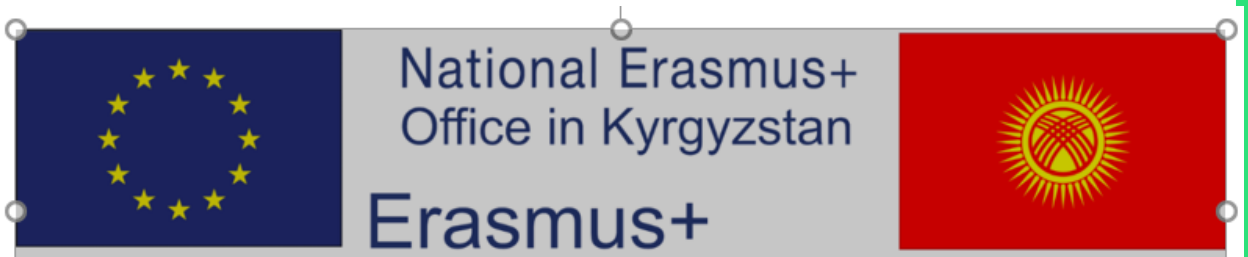
EdTech Ecosystems

- Growing ecosystem of platforms, tools and content providers in education
- Universities should act as orchestrators – selecting, integrating and evaluating tools
- Importance of interoperability standards, open educational resources and public values



5. University Readiness

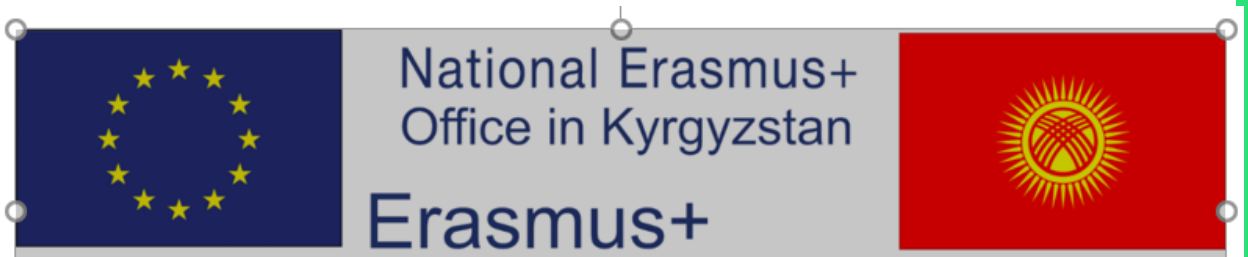
- Strategic alignment: clear vision of the university’s role in the future of work
- Institutional agility: ability to redesign programmes and partnerships quickly
- Data-informed decision-making and continuous improvement culture



5. University Readiness

Governance & Strategy

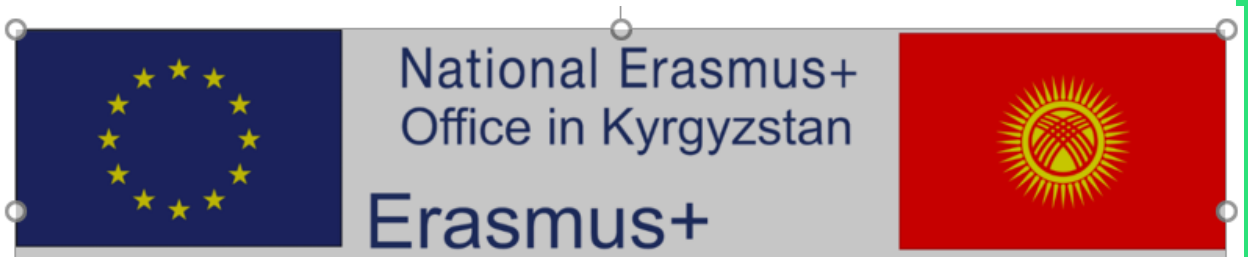
- Involve faculty, students, employers and policymakers in strategic dialogue
- Use scenarios for 2030–2040 to stress-test programmes and investments
- Develop incentives (promotion, funding) with innovation in teaching and engagement



5. University Readiness

Faculty Development

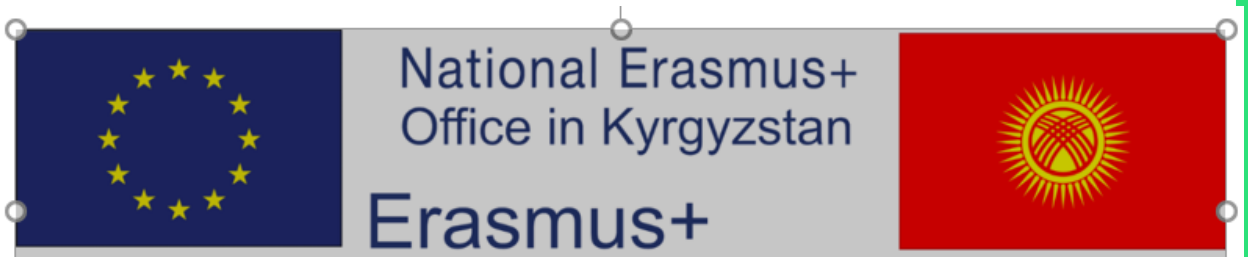
- Support academics to integrate digital tools, active learning and AI into teaching
- Recognise and reward pedagogical innovation and industry engagement
- Communities of practice and peer learning across departments and institutions



5. University Readiness

Infrastructure Requirements

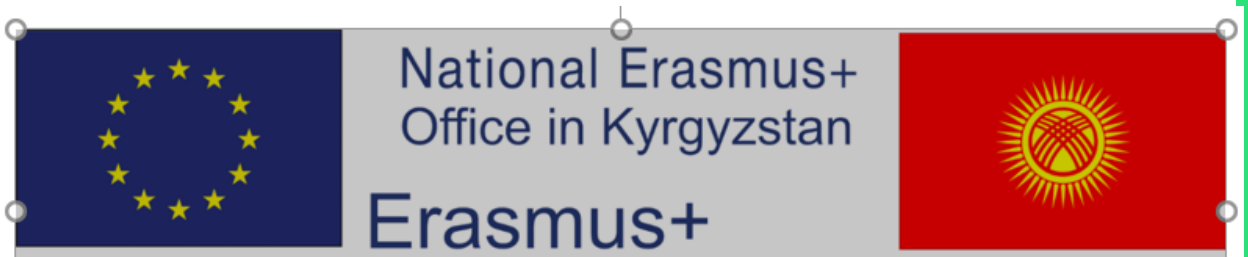
- Reliable connectivity, learning management systems and collaboration platforms
- Spaces for project-based and hybrid learning – labs, studios, incubators
- Data governance, cybersecurity and accessibility as core design principles



5. University Readiness

Partnership Models

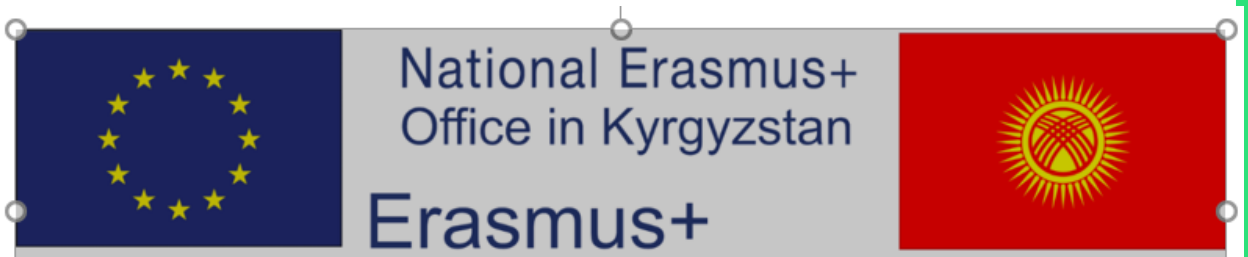
- Cooperation with employers, public sector and civil society on curriculum and research
- Regional innovation ecosystems: clusters, science parks and start-up incubators
- International partnerships for mobility, joint degrees and virtual exchange



6. Outlook

Opportunities for Central Asia

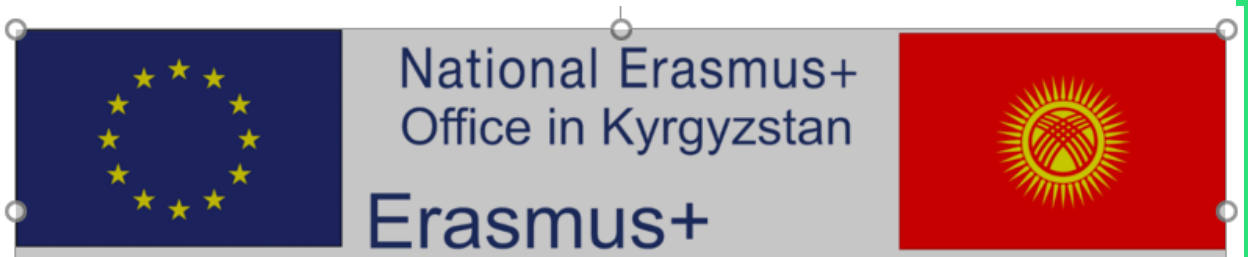
- Young population and strategic location between major regions
- Potential to develop digital infrastructure and education innovation
- Regional cooperation on qualifications, quality assurance and research agendas



6. Outlook

What Universities in Kyrgyzstan Can Do

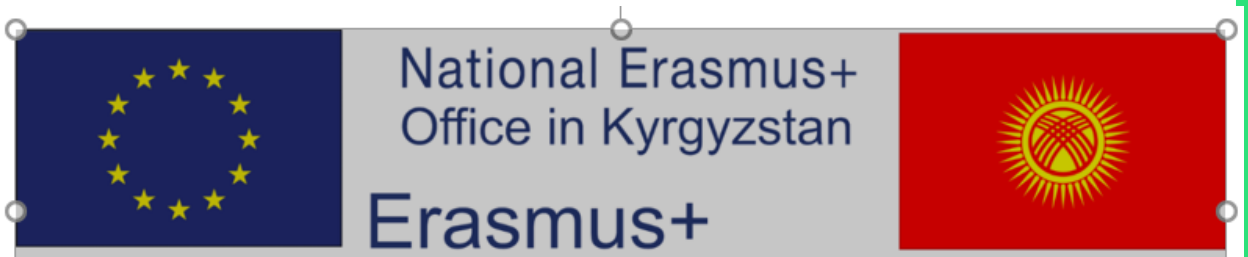
- Map regional labour market trends and co-create programmes with employers
- Invest in digital and AI literacy across disciplines, including teaching staff
- Pilot flexible lifelong learning offers for graduates, teachers and civil servants



6. Outlook

Curriculum Redesign

- Embed interdisciplinarity – combine technical, social science and humanities perspectives
- Integrate future-of-work themes across curricula (automation, ethics, sustainability)
- Develop projects with other organisations to build work-ready capabilities



Thank you very much!