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Future of Work

SDC Webinar

Extended Slide Set

7 December 2020, Michael Morlok



Impressum

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(7 December 2020)

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INTRODUCTION



Why Future of Work?

Switzerland's international cooperation strategy 2021-2024 makes sustainable economic growth, market development and the creation of decent local jobs a priority. Therefore, the changes that are associated with the "Future of Work" are expected to have a strong impact on SDC's work.

These changes include significant shifts in markets and value chains, some of disruptive nature, resulting in jobs disappearing in some areas, and new ones being created in others. This will have important implications for skills requirements, employment and work conditions. Some of the effects are already visible. SDC has a strategic interest to discuss the topic of "Future of Work, as it affects SDC's work in many aspects - and not only SDC, but all its partners and key actors in development cooperation.

Guiding questions

- 1. What changes are being anticipated for low and middle income countries?**
- 2. What are possible implications for topics relevant to VSD / PSD / FSD projects?**

Sources:

- Flagship reports ILO 2019, UNDP 2019, UNIDO 2019, WEF 2020, World Bank 2019 / 2020 (Hypothesis: The narratives and recommendations in these reports are influenced by the respective mandates, but are nonetheless key to how we think about FoW)
- Other selected studies / reports (see bibliography in the Annex)
- Interviews with four development partners (GIZ, FCDO, ILO, SECO)

Terminology

The flagship reports do not contain an explicit definition of “Future of Work”. Looking at how the term is used and discussed, however, a working definition could be:

The term “Future of Work” refers primarily to the impact of digitalization on value chains, skills requirements and employment – in the recent past as well as within the next 10 to 20 years.

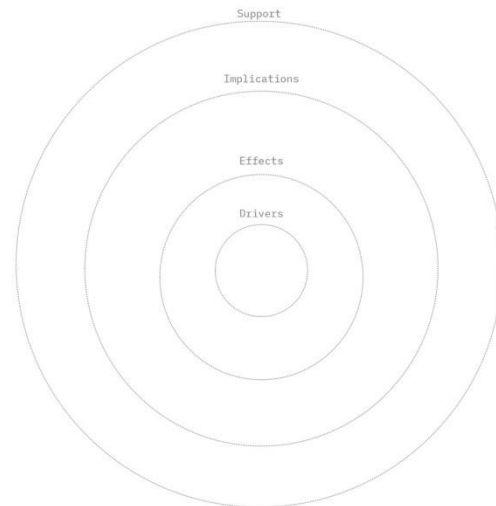
Related concepts are:

- Work 4.0: Term under which “Future of Work” is discussed in Germany, starting with “Re-imagining work: Green Paper Work 4.0 (German Federal Ministry of Labour and Social Affairs, 2015)
- Industry 4.0: The effects of digitalization and automation in manufacturing and other industries



Structure of the slide set

- **Drivers:** What causes the changes?
- **Effects:** What are direct effects?
- **Implications:** What are indirect effects?
- **Support activities:** What is being suggested to leverage opportunities and / or mitigate risks?





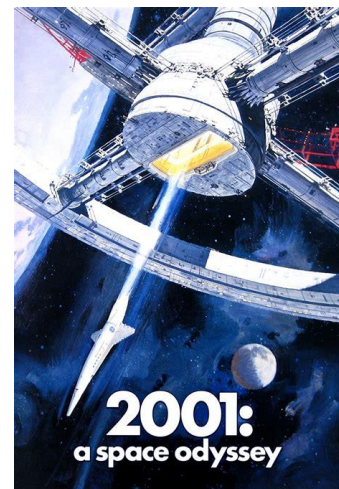
A thought up front

We're terrible at making predictions

- Futurologist bias (male-dominated occupation, often optimistic views on techn.)
- Erratic nature of progress (black swans and unicorns)
- Extrapolation error I: Trends continue as in the past
- Extrapolation error II: Poor / middle income countries react the same way as high income countries

But it's still worthwhile discussing trends

- New SDC projects might last well beyond 2030
- Some changes are already relevant for some partner countries / target groups
- Not all trends are similarly erratic
- Scenario analysis can help



2001 from a 1968 viewpoint:
Sentient computer (AI), civilian
space travel, moon colonisation



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DRIVERS

Many drivers, yet technology dominates the discussion

- Technological change: digitalization, automation, more data
 - Social/cultural change: attitudes towards work, gender equality
 - Demographic change: age, urbanisation, migration
 - Climate change, incl. dwindling natural resources
 - Globalisation: declining cost of transportation/connectivity
-
- Non-technological drivers are given little space in the flagship reports, with the exception of ILO 2019 (demographic change) and UNDP 2019 (climate change; yet not framed as FoW)
 - Other studies have given noticeably more space to demographics and migration, possibly because these studies focus on developed countries (14% of all studies discuss developing countries, the rest developed countries, or both; ILO 2018)





Layers of technology



- “Smart factories” (UNIDO 2019)
 - Industrial Internet of Things (IoT)
 - Cloud computing
 - Big data analytics
 - Advanced robotics
 - Artificial intelligence / machine learning
 - Additive manufacturing
- But also many applications outside the factory gates, for small businesses, consumers, learners
 - Working / buying / selling, e.g. ride-sharing, freelancing, e-commerce
 - Financial solutions, e.g. payment apps, digital saving groups
 - Skills development, e.g. MOOCs, digital credentials

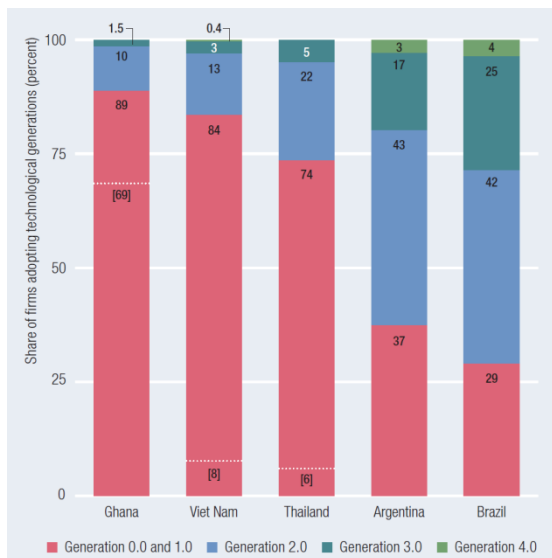
Uneven diffusion of technology



- Uptake of Advanced Digital Production (ADP) technologies differs between countries and industries, and across firms within those
- Larger firms are more likely to adopt new technologies, because it's easier to source funding and such firms already have higher technological and productive capabilities
- UNIDO 2019 discusses 5 challenges in developing countries: Basic capabilities, retrofitting and integration in existing plants, digital infrastructure (electricity and connectivity bottlenecks), digital capability gap (few supply chain “islands” with new technology), access and affordability
- World Bank 2019 and WEF 2020 also mention low cost of labour, skills gaps, information (incl. insufficient understanding of opportunities), shortage of investment capital and trade barriers as hindrance for diffusion of technology



4 generations of production technology



Adoption of Advanced Digital Production (ADP) technologies is still limited among developing countries

Gen 4: Smart Production: DPTs (Digital production technologies) allow for fully integrated, connected, and smart production processes, where information flows across operations and generates real-time feedback to support decision-making (such as use of smart sensors and machine-to-machine communication, cobots, big data analytics, cloud computing, artificial intelligence and 3D printing)

Gen 3: Integrated Production: DPTs integrated across different activities and functions, allowing for the interconnection of the whole production process (such as use of Enterprise Resource Planning systems, fully “paperless” electronic production control system, industrial robots)

Gen 2: Lean Production: DPTs involve and connect different functions and activities within the firm (such as use of CAD-CAM linking up product development and production processes; basic automation)

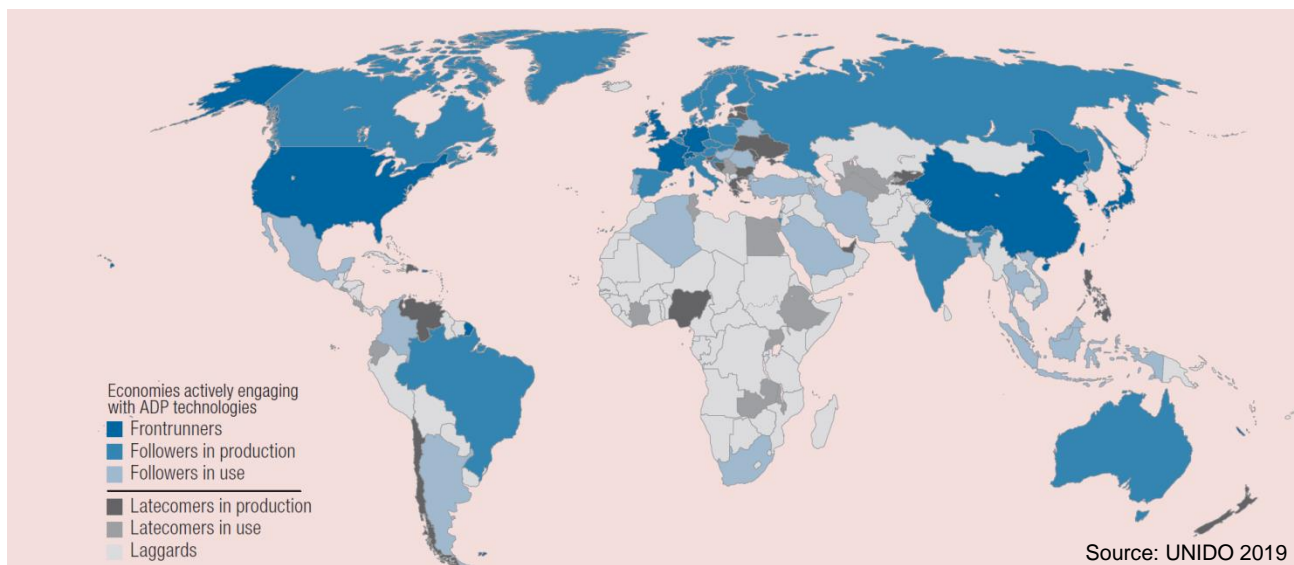
Gen 1: Rigid Production: DPTs limited to a specific purpose in a specific function (such as use of CAD only in product development; use of machines operating in isolation)

Gen 0: Analog Production: No DPTs

Source: UNIDO 2019



Frontrunners and laggards



Frontrunners and laggards (cont.)

Terminology slide 10

Frontrunners: “Economies leading in the production of advanced digital production (ADP) technologies. The group is defined as the top 10 economies in the number of cumulative global patent family applications in these technologies ...»

Followers: “Economies actively engaging in ADP technologies by patenting in the field or trading ADP-related goods, but to less extent than frontrunner economies. The follower group is defined by the average values of patent, export and import activity ... *Followers in production* have above-average patenting activity in ADP technologies, or else have above average export market shares in this field and relative specialization in this type of export. *Followers in use* have both above-average import market shares in this field and relative specialization in this type of import.»

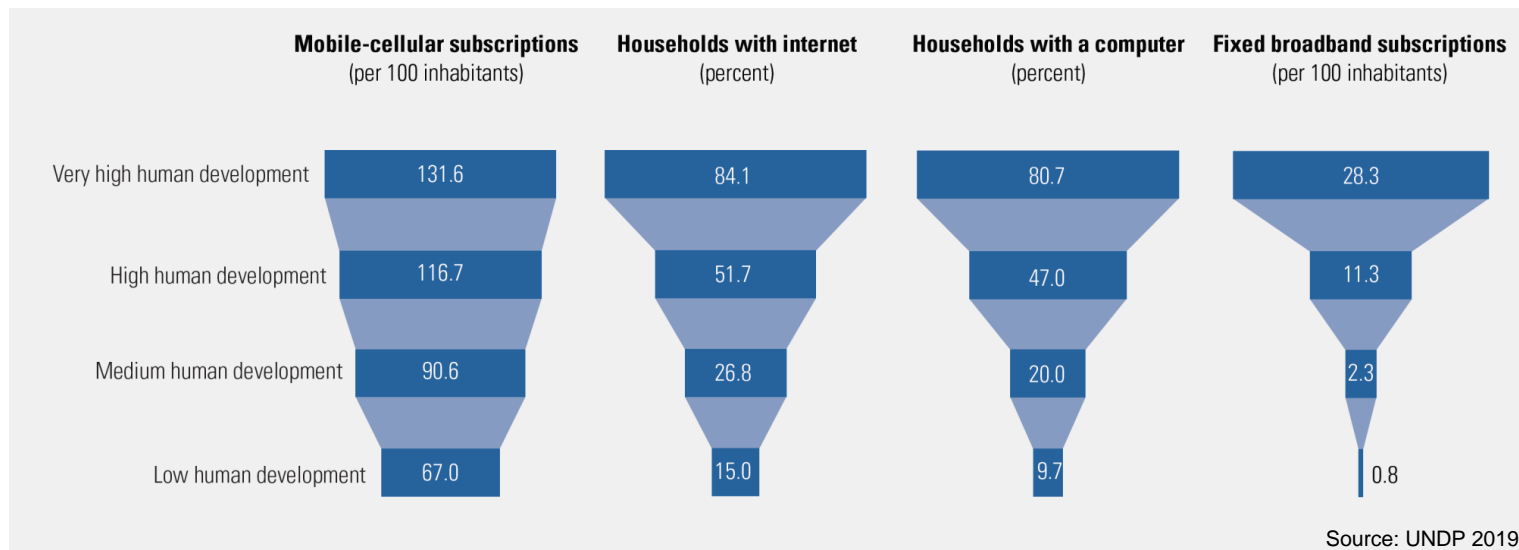
Latecomers: “Economies with some engagement with ADP technologies in patenting such technologies or trading related goods, but less than follower economies ... *Latecomers in production* either have at least one patent family in the ADP field but fall below the sample average, or have above-average export market shares in this field or relative specialization in this type of exports. *Latecomers in use* either have above-average import market shares in this field or relative specialization in this type of imports.»

Laggards: “Economies showing very little or no engagement with ADP technologies.»

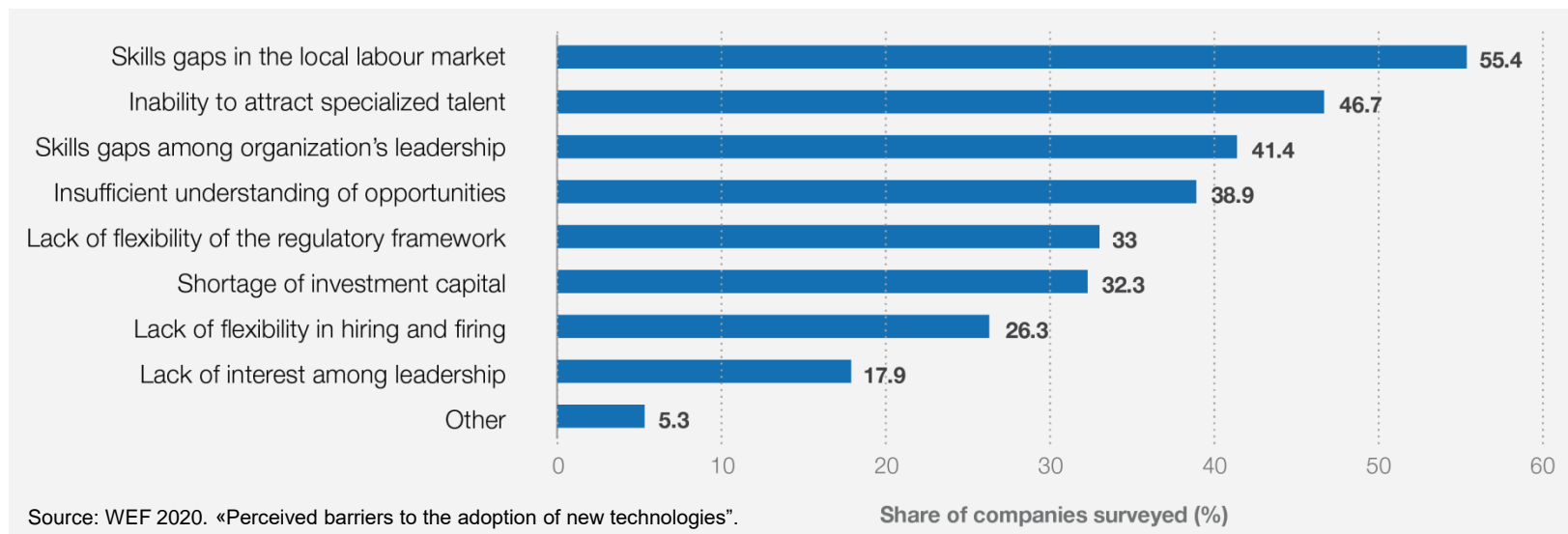
Source: UNIDO 2019



Internet slow to take hold



Barriers to the adoption of technology





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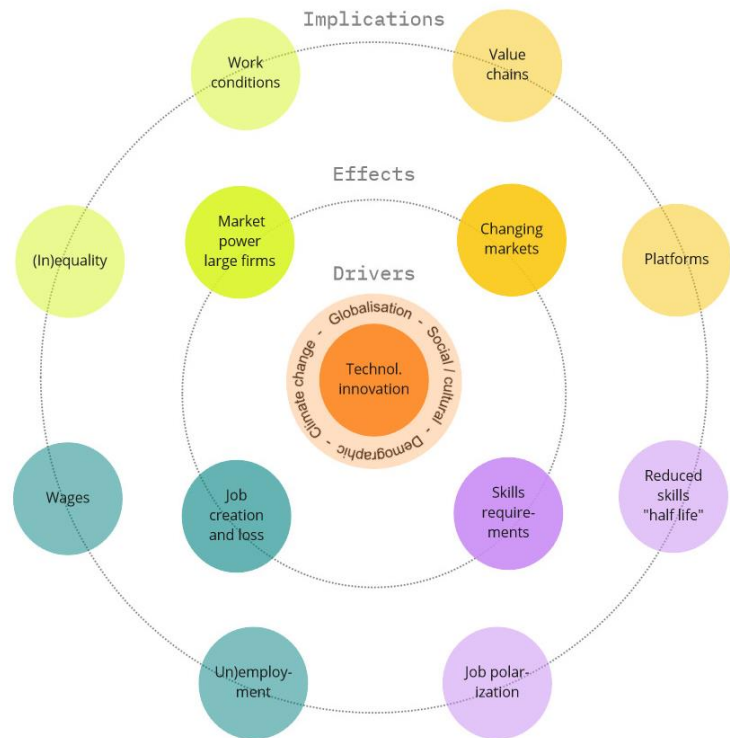
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EFFECTS AND IMPLICATIONS



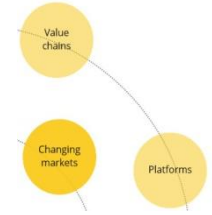
Overview

- The graph shows: topics most frequently discussed in the flagship reports
- The graph does not show: interdependencies, intermediate steps and adjustment mechanisms





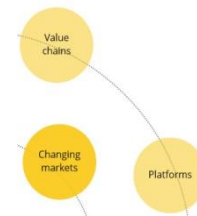
Markets and value chains



- Technology changes productivity, relative costs, and comparative advantages
- Concern whether labour-intensive exports will stay a viable model for developing economies
 - Yet evidence for re-shoring is limited, apart from a few high profile examples (e.g. Adidas 3D printing of shoes in the US and Germany; downsizing work force in Vietnam)
 - Robotization even seems to boost North-South trade, at least for the time being
- Trade costs are likely to fall further, as technology reduces trade and logistics costs
 - Examples: machine translation with AI, cross-country file sharing via cloud, blockchain shipping solutions leading to less transit time and faster payments
- Markets also change due to raising incomes, demographic and cultural shifts

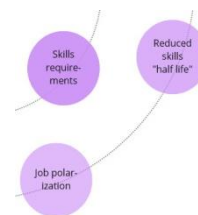
Source: World Bank 2019 / 2020

Platforms

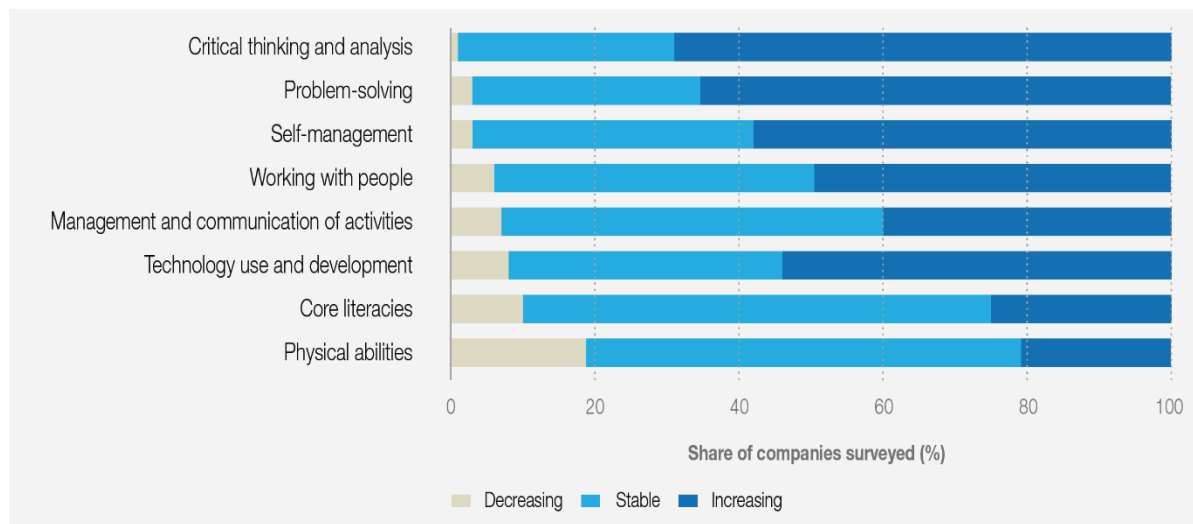


- Digital platform firms connect customers, producers and providers and facilitate interactions
- Low transactional costs, reduced information asymmetries (through rating systems), modularity and innovation
- Opportunities:
 - Even small business can connect with larger markets, location independence
 - Flexible work opportunities, reduced income fluctuation for secondary earners
 - Accessing underused capacity
- Risks:
 - Increased concentration through rating systems
 - Income instability of primary earners
 - Concerns about market power (including stifling competition and work conditions)

Source: UNDP 2019, World Bank 2019 / 2020



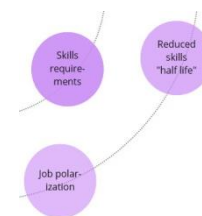
Skills requirements: 2025 vs 2020



Cognitive and soft skills increasingly requested

Source: WEF 2020

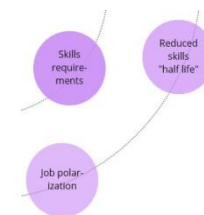
Note: 291 responses from formal sector companies with 100+ staff. 26 countries of which 11 are middle income.



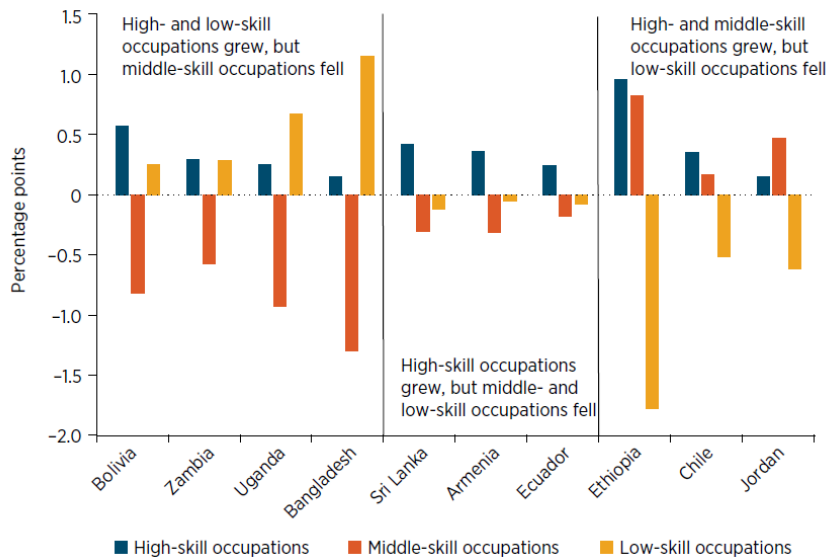
Reduced skills “half-life”

- WEF findings are reflected in UNIDO 2019 (“Skills of the Future”: analytical skills, technology / ICT / STEM skills, soft skills), or World Bank 2019’s forecast of the increased importance of cognitive skills, socio-behavioural skills, and skills associated with adaptability.
- Yet that does not mean that there is full agreement. Some think that digital skills are over-prioritized, and forecast that that only “uniquely human” tasks remain once all other tasks have been codified and automated.
- There are also open questions how these “Skills of the Future” can be learned / taught / assessed
- ILO 2019 and WEF 2018 stress that skills requirements will change quicker than in the past: the “half-life of a skill has dropped from 30 years to an average of 6 years.” (WEF 2018)

Source: Brookings Blum Roundtable 2017, JQ 2018, and sources mentioned above



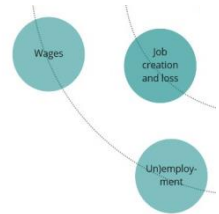
Job polarization?



In many developing countries, the share of employment in high-skill occupations has increased

«Evidence from developed countries points to job polarization—the expansion of high- and low-skill jobs coupled with the decline of middle-skill jobs. ... Is the same pattern beginning to emerge in low- and middle-income countries? Not quite. In many developing countries, the demand for high skill workers is increasing»

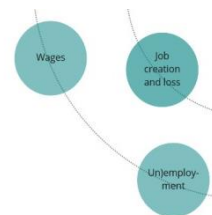
Source: World Bank 2019: Annual average change in employment share, by occupation skill level, circa 2000–circa 2015



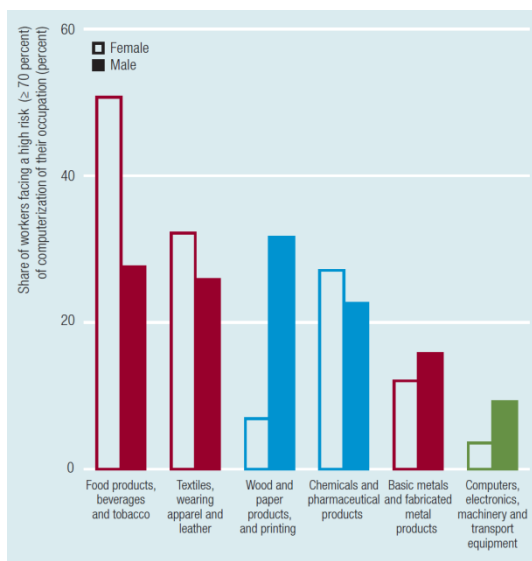
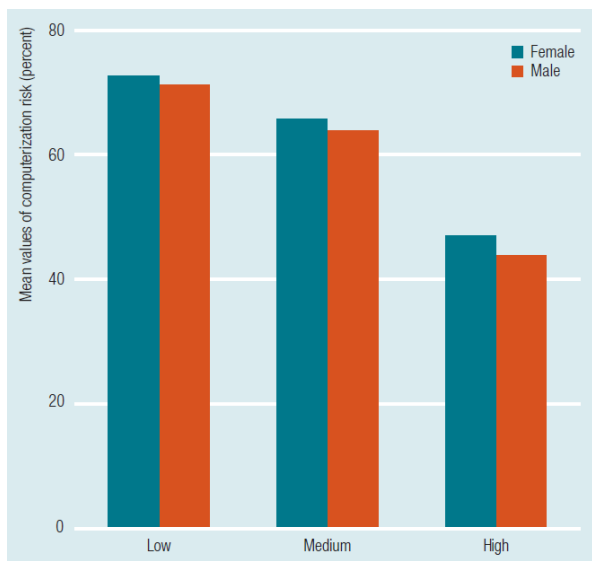
Employment: shifts, not decline

- Debate moved away from eliminating whole occupations / mass unemployment to how the skills composition is changing
- Not all tasks that are automatable are automated (see slide 8 on diffusion)
- Adoption of robotics can generate new jobs (productivity growth in supplier industries lead to increased demand, productivity growth can boost final demand, compositional shifts in the structure of the economy)
- Unequal impact: workers in “codifiable” tasks (i.e. tasks which can be automated) are most affected. Women and younger workers are more exposed, due to industry-/and job-allocation, limited access to better quality jobs and opportunity to develop skills shielding from automatisisation.
- “Technological advances ... will create new jobs, but those who lose their jobs in this transition may be the least equipped to seize the new job opportunities.” (ILO 2019)

Source: Brookings Blum Roundtable 2017, ILO 2019, UNIDO 2019, World Bank 2019 / 2020



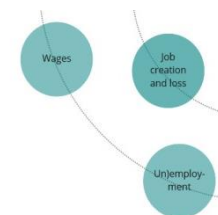
Employment shifts: gender gaps



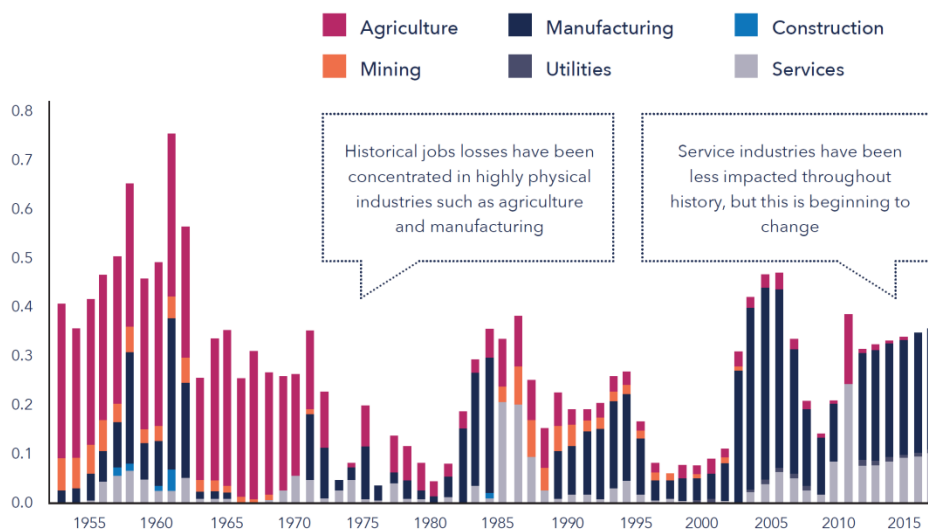
Left: Risk of computerization declines with formal education, but is higher for women in each of the groups.

Right: Allocation of tasks within industries can lead to very large difference in exposure. For women, the risk is particularly large in F&B, while for men it is in wood and paper products.

Source: UNIDO 2019



Is this time really different?

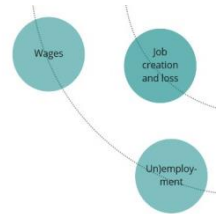


“The rate of automation today is no higher than previous peaks over the last 50 years, but the industries impacted have changed” alphaBeta 2017

No consensus whether it’s different
 ILO 2019: “We now face one of the most important challenges of our times, as fundamental and disruptive changes in working life inherently affect our entire societies ...”

UNIDO 2019: “In fact, many of these technologies have evolved and emerged from the same engineering and organizational principles of previous revolutions, suggesting an “evolutionary transition” more than a “revolutionary disruption.”

Graph: Source: alphaBeta 2017 (study commissioned by Google). Vertical axis shows job losses due to productivity improvement by sector, as % of employment.

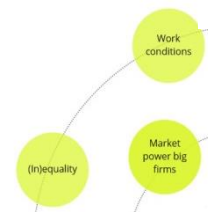


Wages: Decoupled from productivity?

- Wages are correlate with employment demand
- Some groups are more likely to be affected, because of their exposure to automatization (middle-skills) or because of increased competition (low-skills) as workers in the middle skills category are trying to find new employment. Women are more affected (see employment).
- There could be welfare increases through lower consumer prices and higher productivity. Yet: discussion whether productivity and wages are increasingly decoupled.

Source: UNDP 2019, World Bank 2020, WEF 2020

Market power: Increasingly concentrated

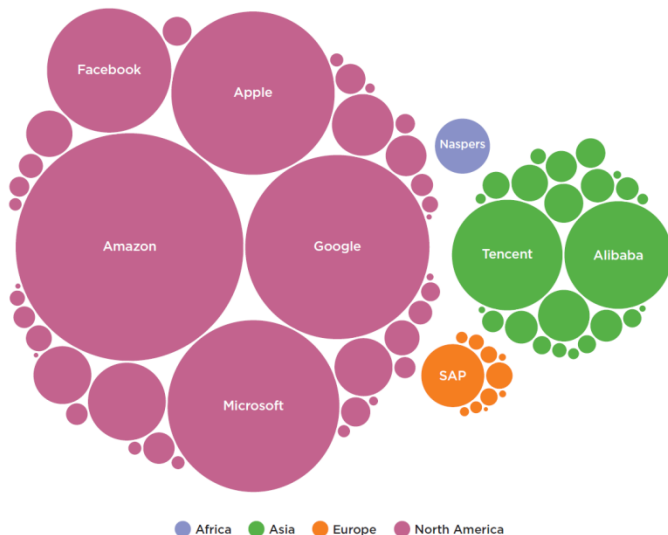
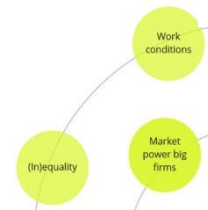


- Economies of scale, not least in data, leads to market power
- Potential abuses:
 - Stifling competition
 - Squeezing profits of supplier firms
 - Tax evasion
 - Pressure on work conditions and wages

Source: UNDP 2019, World Bank 2019 / 2020



A handful of large platforms

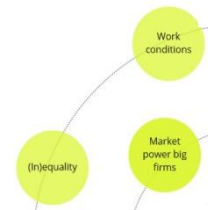


Large platform companies are concentrated in North America and East Asia

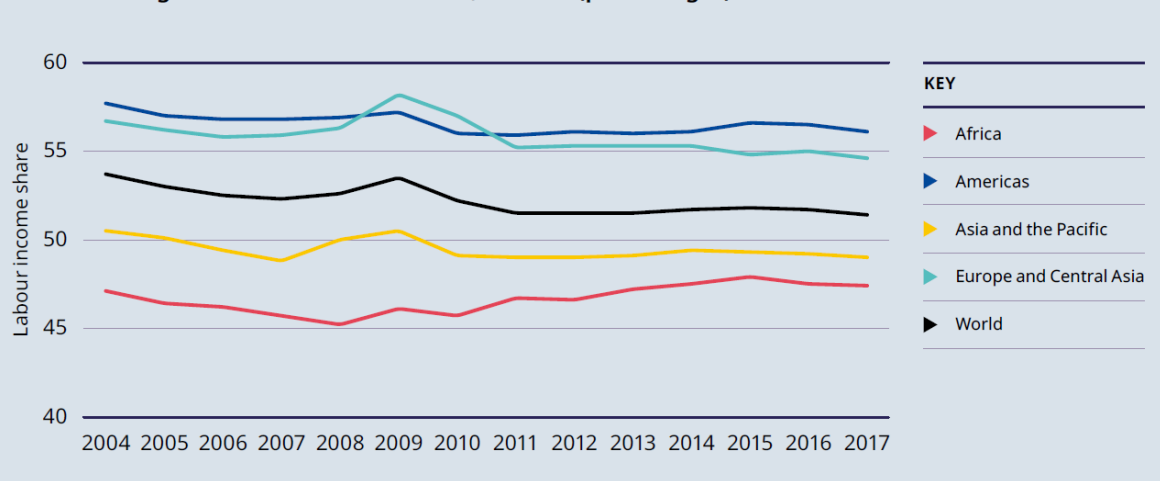
The figure shows the concentration of the world's 75 largest platform firms by region, with bigger circles representing firms with more market capitalization.

Source: World Bank 2020

Falling labour income share



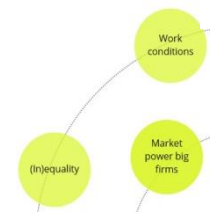
Global and regional labour income shares, 2004-17 (percentages)



“The adjusted global labour income share declined from 53.7 per cent in 2004 to 51.4 per cent in 2017 ... To put that into perspective: if the labour income share had remained constant over this period, instead of declining, then the average worker worldwide would have earned US\$820 (PPP) more per year in 2017.”

Source: ILO 2020.

Work conditions: Risks and opportunities



- Topics: working hours, retirement age, occupational health and safety, pay uncertainty, digital surveillance, informality, weakening of worker organization and bargaining power
- Concern that platform companies return to “day labourers”, and that unbundling of jobs into micro-tasks could lead to smaller job satisfaction and de-skilling
- In developing countries, where most people never had social protection in the first place, “new working patterns are adding to a dilemma that predates the latest innovations” (World Bank 2019)
- Yet “technology can free workers from drudgery and arduous labour. There is even potential for collaborative robots, or cobots, to reduce work-related stress and injury.” (UNDP 2019)

Source: Grimshaw 2020, ILO 2019, UNDP 2019, World Bank 2019

Skills development: New content, new methods, new cycle?

- New forms of teaching / learning, new pedagogies
- Massification and internationalization (incl. MOOC)
- New forms of certification (e.g. digital credentials) supporting recognition / validation of learning outcomes, including non-formal and informal learning
- Better data allows more and quicker insights on what is on demand
- Challenges / concerns:
 - How do get adult learning right? (World Bank 2019: “Better diagnosis and evaluation ... along with better design and better delivery of those programs are needed.”)
 - Do modularisation, microcredentials and “nano-degrees” fragment the system and limit transferability of skills?
 - Where do invest first? (trade-offs)

Sources: AfDB, ADB, EBRD, JQ 2018, IDB 2018, ILO / UNESCO 2020

See dedicated Shareweb page on technology enhanced learning

www.shareweb.ch/site/EI/Pages/Content/Profiles.aspx?SmartID=759&item1=technology%20enhanced%20learning

Financial inclusion: Lots of new ideas, yet little evidence so far

- Some “fintech companies ... are creating solutions specifically for underserved, low-income, or remote customers. Yet for all the general excitement ... there is little information available about how specific fintech innovations solve pain points in financial inclusion.” CGAP 2019
- CGAP 2019 distinguishes five innovation areas: Interactive customer engagement (e.g. mobile customer service), smartphone-based payments (e.g. payment apps), connections-based finance (e.g. digital saving groups), location-based finance (e.g. insurance / credit for farmers), de-risked nonproductive finance (e.g. digital health insurance, digital credit)
- “Increases in e-commerce have ... been dramatic, including individuals and small businesses selling products and services on online platforms ... but these technologies bring new risks that are not fully considered by existing regulations.” (UNDP 2019)
- Platforms can support financial inclusion (e.g. ride-sharing companies’ support to open bank accounts)

Spotlight: insights from “Skills for Industry”

“Skills for Industry” is a R4D (Research for Development) project funded by SDC and SNSF. It includes interviews with 1’000+ industrial companies in Bangladesh, Cambodia, Ethiopia, Laos, Vietnam and South Africa. Findings relevant for the FoW discussion include:

- There are important interactions between technology, product and work organization; change is often driven by changing buyer requests, or when machines have to be replaced.
- The data offers some indication that technological change leads to employment growth. Companies reported that staff is reallocated to other teams when more efficient machines are installed.
- It is common to use technical support from machine suppliers and/or buyers. This reduces the need for upskilling. (yet: creates difficulties to move along the value chain?)
- Little wage change is observed in the middle-skill section, but strong growth for general worker and management – signs of a polarization?
- Formal pre-employment VSD is of little importance in most countries / industries; companies rely on firm upskilling / on-the-job training. Yet: Perception that (formally) skilled employees adopt quicker.



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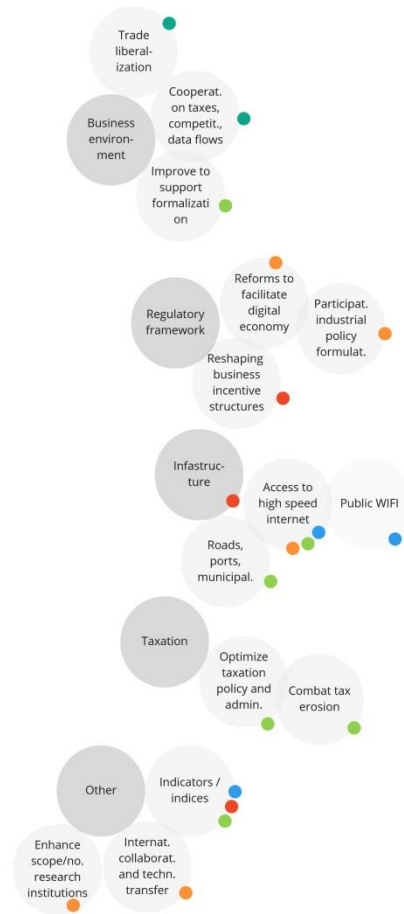
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SUPPORT ACTIVITIES

Support activities

- The next slide summarises the recommendations contained in the flagship reports.
- These recommendations aim to leverage opportunities and mitigate risks and negative consequences. They are addressed to governments, but can in turn be understood as areas where development partners can invest in capacity building, technical support, and policy dialogue (hence: «support activities»).
- The main topics of these recommendations are:
 - Working conditions (including social dialogue, and “reinvigorating the social contract”)
 - Strengthening foundation skills and Life Long Learning
 - Social protection
 - Regulatory framework
 - Strengthening infrastructure (particularly access to broadband)
 - Monitoring change with new indices



- ILO 2019
- UNDP 2019
- UNIDO 2020
- World Bank 2019
- World Bank 2020



Questions to be addressed by Employment and Income

- Topics: What topics are promising, and aligned with SDC's priorities?
- Approach: Seizing opportunities, mitigating risks, and / or monitor change?
- Modality: Mainstreaming FoW, or specific projects? Many small pilot activities, or few visible flagship projects?
- Scope: Economy/society-wide, selected growth sectors, or focus on vulnerable / affected target groups?
- Instruments: Bilateral or multilateral portfolio, strategic partnerships, policy dialogue?
- Partnerships: Implications?

Can ideas be prioritized and / or sequenced? What are the criteria to do so?



Three thoughts for the discussion

- **Context matters:** technological diffusion, as well as export and import markets, widely differ between and within countries. The Future of Work will therefore arrive much earlier for some, and in different form, than for others. This also holds true for SDC's target groups within those countries. Interventions need to be based on local information.
- **The Future of Work is not just about technology:** there are many other changes afoot, which are maybe not as visible or widely discussed – because there is less anxiety around them – but they have great implications as well (e.g. climate change and migration).
- **The Future of Work is not just about the economy and income:** dignity, meaningful work, disenfranchisement / empowerment, and social cohesion, correlate to some degree with the distribution of income, but also warrant their own analysis and discussions.



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ANNEX 1: COVID-19 IMPLICATIONS



Covid 19 implications

World Bank 2020 (<https://blogs.worldbank.org/developmenttalk/why-future-work-policy-agenda-remains-relevant-its-not-just-about-addressing>):

- It is likely that the pandemic will reinforce ... pre-existing trends and increase the urgency of corresponding policy responses.
- The adoption of digital technology will be turbocharged. “Platform firms” are expected to dominate markets even more.
- Firms will have more incentive to invest in automation and reshore production to shield against value chain disruption.
- Pre-existing socio-economic disparities and vulnerabilities will be exacerbated, both within and across countries.
- Labor demand will be weaker and jobs will be lost over the medium term.
- Debt and fiscal space will be big challenges.

WEF 2020

- Automation, in tandem with the COVID-19 recession, is creating a ‘double-disruption’ scenario for workers.
- Job creation is slowing while job destruction accelerates; inequality is likely to be exacerbated.
- The window of opportunity to reskill and upskill workers has become shorter in the newly constrained labour market.



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ANNEX 2: ADDITIONAL INFORMATION ON VET



GIZ: 10 hypotheses on new work and VET

1. VET remains highly relevant for employment, prosperity and social inclusion, especially in the digital age.
2. Digital transformation in VET should help improve the social inclusion and not create new digital divides.
3. Digitalisation of VET can promote digital upskilling of employment structures, but cannot enforce it.
4. Transformation concerns both training content (curricula) and teaching/learning methods (digital media).
5. Modularised training courses in technology-oriented professions make it possible to adjust rapidly.
6. Digital technologies make it possible to tailor training courses to learners and their context.
7. Vocational school teachers require initial and continuing training.
8. 'Digital agents' can act as facilitators between formal training and informal economy, and between theory-based training and practical requirements.
9. Already disadvantaged groups run a particular risk of being excluded from the opportunities. This calls for special measures.
10. Governance in the field of vocational training is of key importance, with a need of all social partners working together.

Source: GIZ 2019 (abbreviated hypotheses)

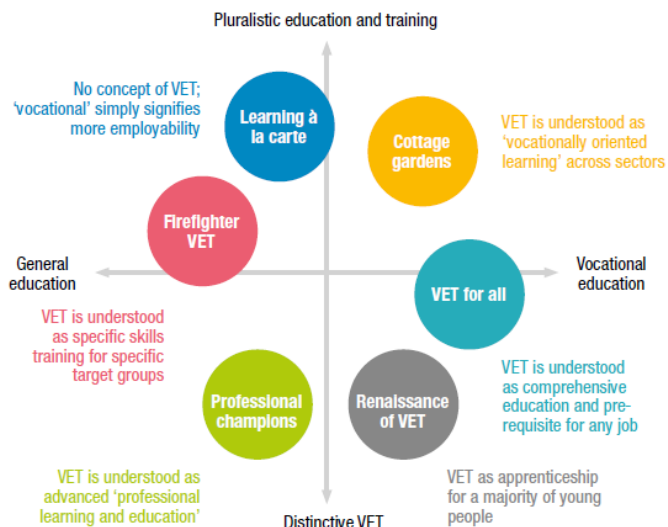
UNEVOC: 10 trends shaping TVET teaching

1. Digitalization has led to growing demand for transversal and applied skills
2. Collect and disseminate skills data to plan for future-oriented TVET
3. Utilize results of skills assessments to develop in-service and reform pre-service training
4. Future-focused TVET systems value industry experience and exposure
5. Linking in-service training to career progression improves TVET staff's receptiveness
6. High quality in-service training focuses on industry exposure, transversal skills and pedagogy
7. Responsive TVET systems train TVET staff on gender responsiveness and inclusive methods
8. TVET of future relies on the private sector as an essential partner
9. Effective stakeholder coordination improves quality of TVET staff development
10. Engaging TVET staff is vital in aligning TVET systems to the future of work and learning

Source: UNESCO-UNEVOC 2020



6 scenarios how VET could develop



Learning à la carte: describes the scenario for a country which has realised the most pluralistic vision of education in which the distinction between VET and general education has become obsolete.

Cottage gardens: describes the scenario for a country in which a range of highly varied but well-arranged and well-organised education provision coexists and in which a vocational orientation plays an important role overall.

Firefighter VET: describes the scenario for a country in which VET is mainly used for tackling deficiencies of the education and labour market system; VET is a minority track mainly concerned with supporting unemployed adults and early school leavers to (re-)enter the labour market.

Professional champions: describes the scenario for a country in which a form of elite VET in the shape of higher apprenticeships has developed, loosely coupled with a mainstream education system which is characterised by general and higher education.

VET for all: describes the scenario for a country in which a comprehensive system of VET has become the first choice and prerequisite for any further training or job.

Renaissance of VET: describes the scenario for a country in which a modernised version of apprenticeship has become the major route at upper secondary level and a strong and distinctive higher VET sector has emerged.

Source: CEDEFOP 2020



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Foreign Affairs FDFA

Swiss Agency for Development and Cooperation
Employment and Income

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