Future Skills for the 2020s

A New Hope

FALL 2020

GLOBAL EDUCATION FUTURES

worldskills Russia

Executive Summary

We are living in a uniquely pivotal moment in time. Structures that bind our society and environment are rupturing, while new pathways are opening for renewal and regeneration. We have a window of opportunity to get things right. Rather than focus on fear, how can we co-create a future that is inspirational and hopeful? What are the skills needed today to build a thriving future for all? The message from hundreds of experts participating in this research is clear, we must:

- **Collaborate, adapt and transform**
- **Embrace future-orientations and technological tools**
- **Embody well-being of people and planet as our primary purpose**

This report is for Vocational Education & Training practitioners & policy shapers, the WorldSkills movement, business people, academia, media and learners of all ages interested in trends and skills. The project aims to identify the impact of transformation of skills across industry sectors, and explore the implications this has on Vocational Education & Training. This has been the focus of the authors team for a decade. Building on prior work in this space,[1] we invite you to explore the critical topic of Future Skills needed to thrive in the 2020s. We co-created 'maps of the future' with hundreds of experts across eight sectors, through explorative 'Rapid Foresight' workshops and surveys.[2] We invite you to the summary of their insights here, and to dive deeper into sectoral details and collaboration opportunities in the full report.

Technological advances have multiplied since the Industrial Revolution, while social change and population growth give rise to ever more cross-pollinating innovators. Each new generation can say the world is changing faster than ever before. As individuals and collectively, we now have greater powers to change our environment and our futures. These powers will soon increase exponentially. Is this the most pivotal decade in our existence?

In our world of increasing change, complexity and uncertainty, we know that skills of the past will not serve us today, or tomorrow. If 20th century market economies were capital-centred, and modern economies become human-centred, then in order to survive and thrive in the 21st century we should create systems that are life-centred and relational. These systems explore our relationships with self, others, places, and other beings. 'Preadaptive'[3] development of skills 'working with future' concerns not only technological progress and its consequences, but also many other issues related to sustainable development and ability to overcome global risks.

This report focuses on factors and skills that are emerging in some shape today. To give insight to direction, timing and relative importance, we asked experts when changes will be significant in the sector i.e. widespread impact, or clearly disrupting sector & transforming roles. This foresight[4] work helps us choose which pieces of potential futures we'd like to keep, change or move away from.

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1 E.g. Atlas of Emerging Jobs, *Future Skills 1.0*, *Kazan Declaration*

2 17 workshops with 302 attendees, 502 survey responses. Experts come from 46 countries and have 6000+ years of sector-specific experience. They are leaders from Business, Academia, Education & Training, NGO & Government officials. This research process took four months in 2020.

3 *A Concept Derived from Evolutionary Biology*

4 Our *Rapid Foresight* methodology was developed with partners such as The International Labour Organisation

Of the megatrends making the world a VUCA place (Volatile, Uncertain, Complex, Ambiguous), Digitalisation is predicted to have the most impact on skills this decade. Other high impact megatrends are Globalisation, Sustainability and Automation. COVID is accelerating change in all elements of work and life today, although later in the decade other trends are predicted to have more impact on skills. There is clearly a need to get ahead of the curve on many of these snowballing megatrends before they avalanche us out of existence. Cyber/AI risks and environmental crises are potentially greater threats than COVID or recession [5]. Self-creating bots are one of many examples of turning points in power and our responsibility this decade. Addressing these complex intertwined challenges of our time requires new fundamental skill sets, holistic ethical application and governance.

How much impact will these Megatrends have on Skills over the next 10 years?

Digitalisation	HIGH	HIGH	Automation
Globalisation	HIGH	MEDIUM	Accelerating Change
Environmentalisation	HIGH	MEDIUM	Demographic Changes

Experts agreed in general that these scenarios are likely this decade:

- Demand for collaborative team skills will be greater than for Individual personal skills
- Customisation & personalisation will continue as we transition away from 1-size-fits-all mass production and education systems
- Life-centred, transformative, regenerative & circular economies come to the fore this decade as we move away from ‘business as usual’ extractive capital-centred consumerism
- Demand for multi-disciplinary generalists will be greater than for narrow specialists. COVID restrictions, automation, job losses and structural employment shifts are some of the factors driving the trend towards multifunctional roles.

And to a lesser extent:

- Algorithms will control people & behaviour more than people control algorithms
- Skills gap will close
- National self-sufficiency will continue to grow, with borders closed, inward orientation, political & social disruption of global collaboration

5 WEF & Global Challenges Foundation

At a more detailed level, experts predict these factors to impact skills significantly across all sectors:

2020

- Remote Work = New Norm
- Strict Hygiene / Biosecurity
- Unemployment & Reduced Spending
- National Self Reliance & Domestic Supply Chains
- Eco Materials & Production Modes Essential
- Digital Currency replaces Cash
- Personalisation of Manufacturing
- Nationalization of Platforms & Data
- Permanent Loss of Jobs due to Structural Shifts
- Demographic Changes: Workforce becomes increasingly Senior
- Total Digital Monitoring

2030

- Cybersecurity & Privacy Threats
- Industrial Internet: Big Data Analytics & IoT
- 3D Printing
- Supply Chain Transparency
- Mixed / Augmented / Virtual Reality
- AI prediction & Self-learning Machines
- Robotics & Cobots
- New Human-computer Interfaces (Touch/Brain)

Factor Clusters

COVID ACCELERATED

TECHNOLOGY /SMART

GENERAL

Here we see #1 top influencing factor by sector. COVID-19 related factors are indeed shaping the beginning of the decade, while advancements in digitalisation and automation play crucial role towards the end of the decade.

Top Factors affecting Skills *

	ALL SECTORS	MANUFACTURING & ENGINEERING	CONSTRUCTION & INFRASTRUCTURE	TRANSPORTATION & LOGISTICS	ICT & DIGITAL	HUMAN & SOCIAL SERVICES	CREATIVE INDUSTRIES	AGRICULTURE & ECOLOGY
2020	Strict Hygiene & Biosecurity Rules	Strict Hygiene & Biosecurity Rules	Strict Hygiene & Biosecurity Rules	Strict Hygiene & Biosecurity Rules	Remote Working = New Norm	Remote Working = New Norm	Remote Working = New Norm	Resource shortages: Soil Degradation, Biodiversity Loss & Malnutritious Food
2030	Robotics & Cobots	AI Prediction & Self-learning Machines / Production Lines	Smart Infastructure Sensing Environmental & Digital Metrics	Unmanned Vehicles	Automated Coding	Customised Services	New Human-computer Interfaces (Touch, Brain)	AI Prediction & Self-learning Machines / Production Lines

Factor Clusters

- COVID ACCELERATED
- TECHNOLOGY /SMART
- GENERAL
- SECTOR SPECIFIC

Source: GEF Expert Surveys, n=350

*** Descriptions and details** of how this picture changes considerably for each sector can be found in Chapters 2, 4 & 5.

Emerging Paradigms of the 2020s

1. **SMART** From inert things to smart environments. Everything is programmable and interconnected. Cybersecurity is critical, and digitalisation drives change. New social classes defined by technological literacy can be seen today.

2. **RELOCALISED** From globalised supply chains and economies of scale to relocalised independently resilient production networks serving local communities and bioregions.

3. **CREATIVE** From standardised produce to creativity-infused products. Human-centred design, personalisation and creativity are becoming the norm across all sectors. As automation increases, technology empowers the rise of the 'creative class' — anyone can be a creator. Mass uniqueness assumes that everyone produces and consumes things that are unique. This uniqueness applies to skill sets and careers. Creativity and uniqueness will be the main value drivers of the decade, for employees and companies alike.

4. **EXPERIENCE-BASED** From alienated consumerism to participative experience-based economy. Prioritising experiences over material consumption helps bridge social, cultural divides, connecting us to the present & our environment. The consumer can become the producer & co-creator. Economic indicators (GDP, shareholder value) are no longer the ultimate goal, but become means to the greater goals of personal and relational well-being.

5. **COMPLEX / NETWORKED** From linear systems to networked complex structures. COVID-19 reminds us that everyone and everything is interconnected. Personal, societal and planetary well-being are inextricably entwined in everyday social ecosystems. Our viewpoints transition from binary, solo and siloed to multidimensional, nuanced networks and ecosystems.

6. **REGENERATIVE** From extractive to regenerative economy. From industrial revolution hierarchical command, control & conquer styles and Take-Make-Use-Lose consumption mindsets to nature-inspired, emergent, distributed, zero waste, life-centred, holistic, long-term, purposeful perspectives and abundance mindsets. Regeneration goes further than sustainable practices by focusing on improvements rather than maintaining status quo. Shifting from transactional outputs to holistic outcomes (e.g. Farming, Construction, Manufacturing) includes focusing on environmental impacts (e.g. soil health, carbon & biodiversity) & social welfare throughout the value chain, as well as traditional economic measures (e.g. yield, productivity, profit margin).

These paradigms weave together interdependently with blurred boundaries. Indeed, integration surfaced as a recurring theme throughout our research e.g. weaving combinations of skills together, and/or across sectors. "*We are now on the verge of shifting into an economic paradigm that is not about communism or capitalism; it is about recalibrating equity and sustainability into a development paradigm.*" — Achim Steiner, UNDP Administrator, 2020[6].

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[6] The Key Role of Mindsets in Human Development, Jürgen Nagler UNDP

Skills to Thrive: Critical Curricula for the 2020s

Our analysis across sectors resulted in a recurrent set of skills that appear to be fundamental, or universally critical:

COGNITIVE & FOUNDATIONAL

Internal skills of self that help an individual adapt and thrive in the increasingly complex & uncertain world. Critical thinking and learning how to learn feature heavily at the top of industry sector skills priorities, as voted for by 350 sector experts. This is echoed by a majority consensus of 120 Education & Training experts surveyed, stating the training focus should be: flexibility & openness; critical & creative thinking; systems thinking & understanding complexity.

SOCIO-ECONOMIC & CULTURAL

Relational skills that support prospering in teams and across communities & networks, catalysing groups and social cohesion. Skills from this cluster (e.g. facilitation, co-creation, social & emotional skills, user-centric approaches) are number 1 in most sectors, both now and in 2030 predictions. In 2020, collaboration is the most significant skill across sectors. E&T expert consensus on key skills: collaboration (multicultural, on/offline) & enhancing team performance (e.g. collective intelligence & AI or building trust); empathy; learning to learn & unlearn.

TECHNICAL & DIGITAL

Skills that connect to the 2020s tech reality and help use the full potential of digitized workplaces. At a general level, digital fitness becomes an essential. Big Data and Cybersecurity are considered significant this decade by all 350 sector experts surveyed across all 7 sectors, the only skills reaching this level of consensus. E&T expert consensus on key skills: mathematical & logical thinking complemented by AI skills, such as content creation, data mining & analysis.

GREEN & UNIVERSAL WELL-BEING

Skills that ensure we are building a thriving future for all life, including future generations. Regenerative,[7] sustainable & well-being skills are some of the most significant in most sectors with the notable exceptions of ICT & Manufacturing & Engineering. E&T expert consensus on key skills: understanding climate change effects & interventions, environmental management theory & technologies, applied to be regionally relevant; well-being skills (mental, physical & digital).

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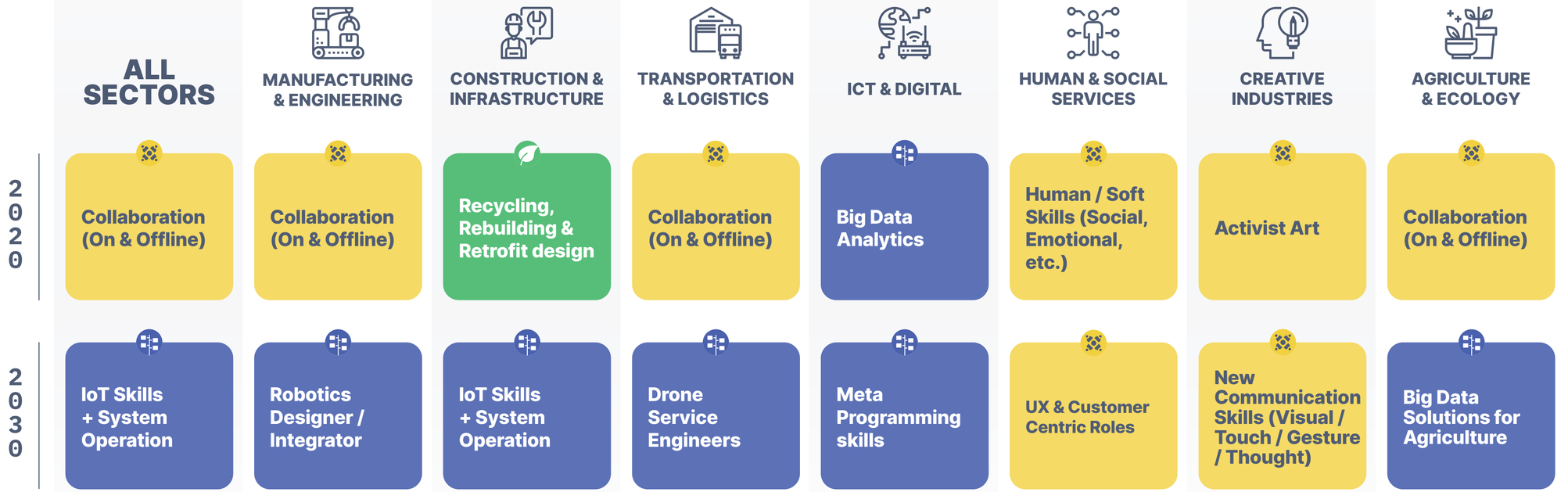
[7] Daniel Christian Wahl's *article contains a treasure trove of regenerative education resources*

Most Significant Skills *



Skills/Roles Clusters

- TECHNICAL & DIGITAL
- SOCIO-ECONOMIC & CULTURAL
- GREEN & UNIVERSAL WELLBEING

2030 skills mentioned here are rising in siginifcance during the decade. They can be seen as additional to siginificant skills in 2020, rather than replacing them.
Source: GEF Expert Surveys, n=350

* **Descriptions and details** of how this picture changes considerably for each sector can be found in Chapters 2, 4 & 5.

Implications for Education & Training 2020s

Which training areas are MOST CRITICAL to prepare for the next 10 years? *

	ALL SECTORS	MANUFACTURING & ENGINEERING	CONSTRUCTION & INFRASTRUCTURE	TRANSPORTATION & LOGISTICS	ICT & DIGITAL	HUMAN & SOCIAL SERVICES	CREATIVE INDUSTRIES	AGRICULTURE & ECOLOGY	EDUCATION & TRAINING SECTOR
1	**Adaptability, Future Thinking & Navigating Change**	**Adaptability, Future Thinking & Navigating Change**	**Adaptability, Future Thinking & Navigating Change**	**Environmentally Sustainable & Regenerative Practices**	**Cybersecurity**	**Environmentally Sustainable & Regenerative Practices**	**Entrepreneurial Skills, Customer Focus & UX**	**Environmentally Sustainable & Regenerative Practices**	**Adaptability, Future Thinking & Navigating Change**
2	**Environmentally Sustainable & Regenerative Practices**	Robotics & Internet of Things	Environmentally Sustainable & Regenerative Practices	Adaptability, Future Thinking & Navigating Change	Adaptability, Future Thinking & Navigating Change	Adaptability, Future Thinking & Navigating Change	Adaptability, Future Thinking & Navigating Change	AI & Big Data Analytics	Critical & Creative Thinking, Understanding Biases
3	**AI & Big Data Analytics**	Collaboration & Co-Creation (On & Offline)	3D Manufacturing	Cybersecurity	Critical & Creative Thinking, Understanding Biases	Entrepreneurial Skills, Customer Focus & UX	Systems Thinking & Understanding Complexity	Robotics & Internet of Things	Collaboration & Co-Creation (On & Offline)

Source: GEF Expert Surveys, n=502

Training Areas Clusters: TECHNICAL & DIGITAL; COGNITIVE FOUNDATIONAL; SOCIO-ECONOMIC & CULTURAL; GREEN & UNIVERSAL WELLBEING

* **More details** of sectoral differences can be found in Chapter 5.

Education Systems for the 2020s

These are key findings — i.e. majority consensus —
from 120 E&T experts, supported by insights from sectors.

❖ **Teaching methods**: Virtual / remote training of practical skills & soft skills, together with simulation, role-play, gamification and team-based learning.

❖ **Teacher development areas**: Design & deliver digital / blended courses; Motivation & empowerment skills (e.g. developing student curiosity).

❖ **Assessments**: Human skills, creative capacity, life skills (e.g. mindfulness, open-mindedness, etc.); Transnational skills assessment (e.g. 'Demonstration Exams' according to WorldSkills standards)

❖ **Frameworks**: Learning ecosystems, including multilocation learning environments, community embodied learning models; VET centres / colleges as 'organisations that learn' (updating their curriculum & approaches constantly).

❖ **Collaboration opportunities to become more future-fit**:

» Global network of 'prototype spaces' to test 'skills of the future' (with Global Industrial Partners & research centres)
— Learning Labs/clubs as hub spaces for life-long learning

» Development of international skills standards & infrastructure (e.g. 'Future Skills' in WorldSkills Competitions, sustainable / regenerative economy skills training)

» Knowledge sharing between teachers, e.g. through inquiry networks, international internships, acceleration programs for VET institution teams to improve curriculum & learning methods

» Development of open and freely accessible educational resources, e.g. MOOCs (Massive Open Online Courses)

» Industry-led challenges to solve industry problems

» Creating partnerships between business & education, e.g. hybrid learning environments (combining classroom-company-outdoors-virtual space), pooling of resources, apprenticeships & internships

Stakeholder-specific Strategies

Please see chapter 6 for the full list of stakeholders, strategies and details. Key recommendations:

Education & Training, Policy

- Support teachers and learners to adopt new pedagogies and tools (e.g. digital) that empower students and encourage collaboration.
- Where possible, deregulate VET institutions to encourage experimentation, e.g. digital badging & blockchain for adaptable distributed assessments.
- Prioritise collaborations between businesses and training institutions in critical areas, e.g. collaborations in Manufacturing & Engineering and ICT, or in Agriculture (which has extreme impact on the well-being of people and planet).
- Catalyze & 'weave' local & national learning ecosystems by facilitating multi-stakeholder alliances & collaborations: learning beyond classrooms; experiential education based on real problems; catalysed by transformative learning community builders.
- Develop knowledge sharing platforms and 'integrator' roles to bridge the knowledgegap between tech developers and users in critical areas, such as sustainable / regenerative practices. Policies & practices are needed to support adoption of existing technologies. Integrators are key roles to bridge gaps.
- Design and promote an integrated approach to measure and manage economic, social and environmental dimensions, e.g. Doughnut Economics.
- Continually monitor the skills gap, e.g. quarterly 'pulse check' with a pool of businesses, educators, learners and workers. Regularly update curricula and assessment frameworks to reflect changing skills landscape (e.g. every 2 years).
- Develop freelancing & entrepreneurship policies & practices to empower those displaced to create their own jobs.
- Create standards to oversee ethical regulation of technology development (such as AI) and their educational applications.

Companies

- Close the skills gap and get closer to pool of fresh talent by forging closer relationships with educational institutions. Identify business problems that can become professional education case studies & opportunities for student problem-solving challenges.
- Foster culture of learning: encourage mentorship and apprenticeship models; cultivate teaching capacity of employees. Typically, it is cheaper to reskill, rather than hire or outsource.
- Promote adoption of advanced technology and future skills by offering employees new skills and growth opportunities.

- Create collaborative ecosystems that build ‘win win wins’ with partnersthrough the value chain/circle.
- For greater growth, communicate how your company’s purpose and culture contributes to thriving people and planet, e.g. consider which Sustainable Development Goal aligns to your mission.

Individual Learners — Students, Parents, Employees, Everyone!

- Master life skills and mindsets that are essential for the 21st century, including learning how to learn, collaboration, empathy, futures literacy and openness.
- Learn about and experiment with new technologies and practices that become mainstream.
- Take responsibility for professional development & career path, rather than expect an employer or government to unlock your full potential, passions and purpose.
- Organise learning circles that help learn skills — engaging in online courses & communities and practising on your own.
- Create student and parent committees that demand changes in education and lead dialogues on necessary changes.

Every person has the potential to shape their world — our world — with every action. To thrive today we must find new ways to listen, collaborate and adapt together. Digital fitness [8] becomes essential, bringing power and opportunity. There is hope that automation can free us to be more purposeful and creative. As our skill sets adapt to the new landscape of the 2020s, so must our mindsets: towards our thriving, regenerative future.

What does this mean for you today?

Please do continue the co-creation of our shared future!
We welcome feedback on this document at partners@globaledufutures.org or rda@worldskills.ru.

[8] We use ‘Digital Fitness’ as a proxy for digital literacy and digital intelligence, because ‘fitness’ implies conscious well-being, rather than just knowledge.