intel

Solution Brief
Intel® Skills for Innovation

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Reinventing technology's role in education to empower students to become the next generation of innovators

Future job markets will need more cognitive, social-emotional, and technological skills.[1]

Skills	% Change in hours worked by 2030 (US and Western Europe)
Physical and manual skills	▼ 11%+
Basic cognitive skills	▼ 14%+
Higher cognitive skills	▲ 7%+
Social and emotional skills	▲ 22%+
Technological skills	▲ 52%+

The Jobs Landscape in 2025[2]

85 Million

Declining roles, global change by 2025

01	Data Entry Clerks
02	Administrative & Executive Secretaries
03	Accounting, Bookkeeping & Payroll Clerks
04	Accountants and Auditors
05	Assembly & Factory Workers
06	Business Services & Administration Managers
07	Client Information & Customer Service Workers
08	General & Operations Managers
09	Mechanics & Machinery Repairers
10	Material-Recording & Stock–Keeping Clerks

97 Million

Emerging roles, global change by 2025

01	Data Analysts & Scientists
02	AI & Machine Learning Specialists
03	Big Data Specialists
04	Digital Marketing & Strategy Specialists
05	Process Automation Specialists
06	Business Development Professionals
07	Digital Transformation Specialists
08	Information Security Analysts
09	Software & Applications Developers
10	Internet of Things Specialists

Education Systems Have Reached an Inflection Point

The Fourth Industrial Revolution has integrated digital technology into every aspect of our lives. As a result, the competencies required for success in the global workforce are being redefined. Workplaces today demand that workers come prepared with new ways of thinking and solving problems. Education leaders are seeking to foster future-ready technology skills in ways that feel as natural to students as learning math and language skills.

Additionally, the COVID-19 pandemic has dramatically accelerated technology use around the world. A variety of classroom-, remote-, hybrid-, and blended-learning environments are being deployed, each with unique challenges. The experience has brought into sharp focus the need for built-in, long-term, resilient systems, as chronicled by a recent UNESCO International Bureau of Education report.[3] These moves toward greater access, flexibility, robustness, and equity are a good start, yet most of them happened without much foresight and need closer integration of technology into a future-ready education system.

As workplace requirements shift, employers, governments, and their citizens are calling for education systems—and the way they use technology—to better prepare students for the future.

Intel® Skills for Innovation (Intel® SFI) Initiative and Implementation Framework Promote Skills-based Learning
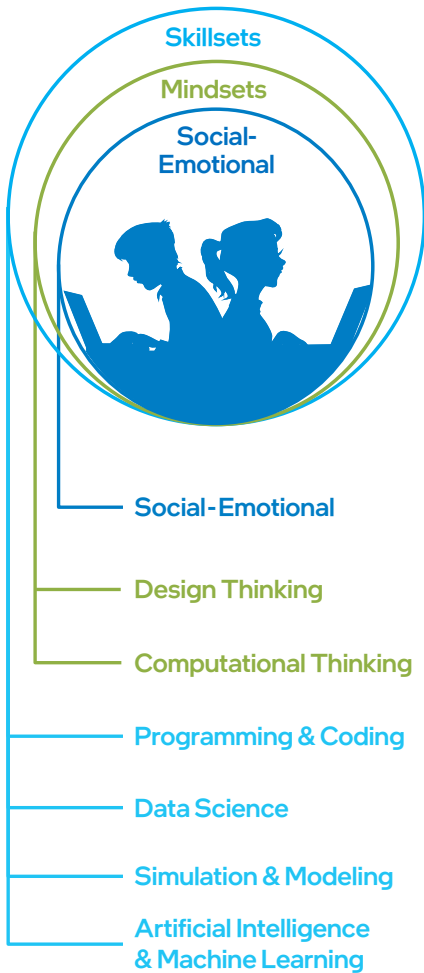
With these considerations in mind, Intel has developed the Intel Skills for Innovation Initiative. Based on research about what works, the Intel SFI Initiative represents a new approach for education that embraces and fosters skills critical for students' future success by focusing on three primary objectives:

- Reinventing the role of technology in education to improve education system resilience and help bridge the industry skills gap
- Using technology to foster students' higher-order thinking and skills development
- Using technology to apply curriculum concepts and tie them to real-world problem-solving

By putting technology at the center of building advanced learning skills, rather than simply using it to access existing educational content, the Intel SFI Initiative creates new opportunities for future-ready skills development.

In the wake of the pandemic disruption, many education systems are revising their action plans to continue meeting future needs, with an emphasis on technology integration. To streamline and support these efforts, Intel has also developed an implementation framework. The Intel SFI Implementation Framework focuses on seven essential mindsets and skillsets (next page), and includes a four-step adoption

The Intel® Skills for Innovation Framework focuses on key competencies needed in the workplace of tomorrow.

Skillsets
Mindsets
Social-Emotional

Social-Emotional

Design Thinking

Computational Thinking

Programming & Coding

Data Science

Simulation & Modeling

Artificial Intelligence & Machine Learning

plan (Figure 2 below), helpful resources, and a suite of programs that can be readily rolled out. It integrates skill-building technology activities into everyday teaching and learning, bringing real-world relevance to curriculum content while equipping students with the skills to flourish in the workplace of the future.

Getting from Where You Are to Where You Want to Be

As education planners build a vision and identify steps to reach it, it helps to keep a couple of important concepts in mind. The first is adaptability: a future-oriented model shifts educational planning from short-term fixes to long-term visions. The goal is to plan for the future, not only for the future pandemic.

A second, related concept is robustness. Technology resources must be easy to access and use, adaptable to a variety of workloads and learning modalities, and must deliver reliable, secure access to learning resources that help build skills for tomorrow.

As education systems transform, it is inevitable that roles will evolve. Decision makers, educators, and students will all see their practices shift as the framework is implemented, and a change in one aspect of the learning environment will impact the rest of the system. A flexible mindset will be an advantage.
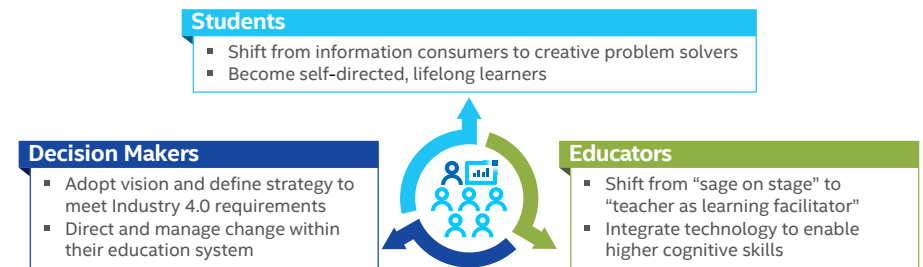
Students
- Shift from information consumers to creative problem solvers
- Become self-directed, lifelong learners

Decision Makers
- Adopt vision and define strategy to meet Industry 4.0 requirements
- Direct and manage change within their education system

Educators
- Shift from "sage on stage" to "teacher as learning facilitator"
- Integrate technology to enable higher cognitive skills

Figure 1. Participants will all see their roles shift as the framework is implemented.

Path to Adopting Skills for Innovation

The Intel SFI Framework provides technology recommendations, tools, and training to support decision makers and educators. Its four-step adoption plan offers a practical roadmap for education systems through the Plan-Experience-Train-Deploy model highlighted below.
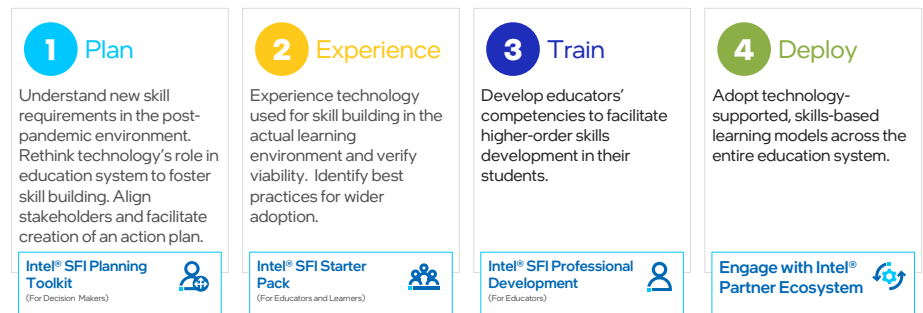
1 Plan

Understand new skill requirements in the post-pandemic environment. Rethink technology's role in education system to foster skill building. Align stakeholders and facilitate creation of an action plan.

Intel® SFI Planning Toolkit
(For Decision Makers)

2 Experience

Experience technology used for skill building in the actual learning environment and verify viability. Identify best practices for wider adoption.

Intel® SFI Starter Pack
(For Educators and Learners)

3 Train

Develop educators' competencies to facilitate higher-order skills development in their students.

Intel® SFI Professional Development
(For Educators)

4 Deploy

Adopt technology-supported, skills-based learning models across the entire education system.

Engage with Intel® Partner Ecosystem

Figure 2. The Intel SFI four-step path.

Ready to take the next step? For more information about how to apply the Intel SFI Framework to your educational environment, please visit **skillsforinnovation.intel.com**.

[1] Exhibit from "Skill shift: Automation and the future of the workforce", May 2018, McKinsey Global Institute, www.mckinsey.com. Copyright © 2020 McKinsey & Company. All rights reserved. Reprinted by permission. Note: Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom.

[2] Saadia Zahidi et al. The Future of Jobs Report 2020, (World Economic Forum, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

[3] Conrad Hughes, Some Implications of COVID-19 for Remote Learning and the Future of Schooling, (UNESCO International Bureau of Education, 2020), https://unesdoc.unesco.org/ark:/48223/pdf0000373229

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