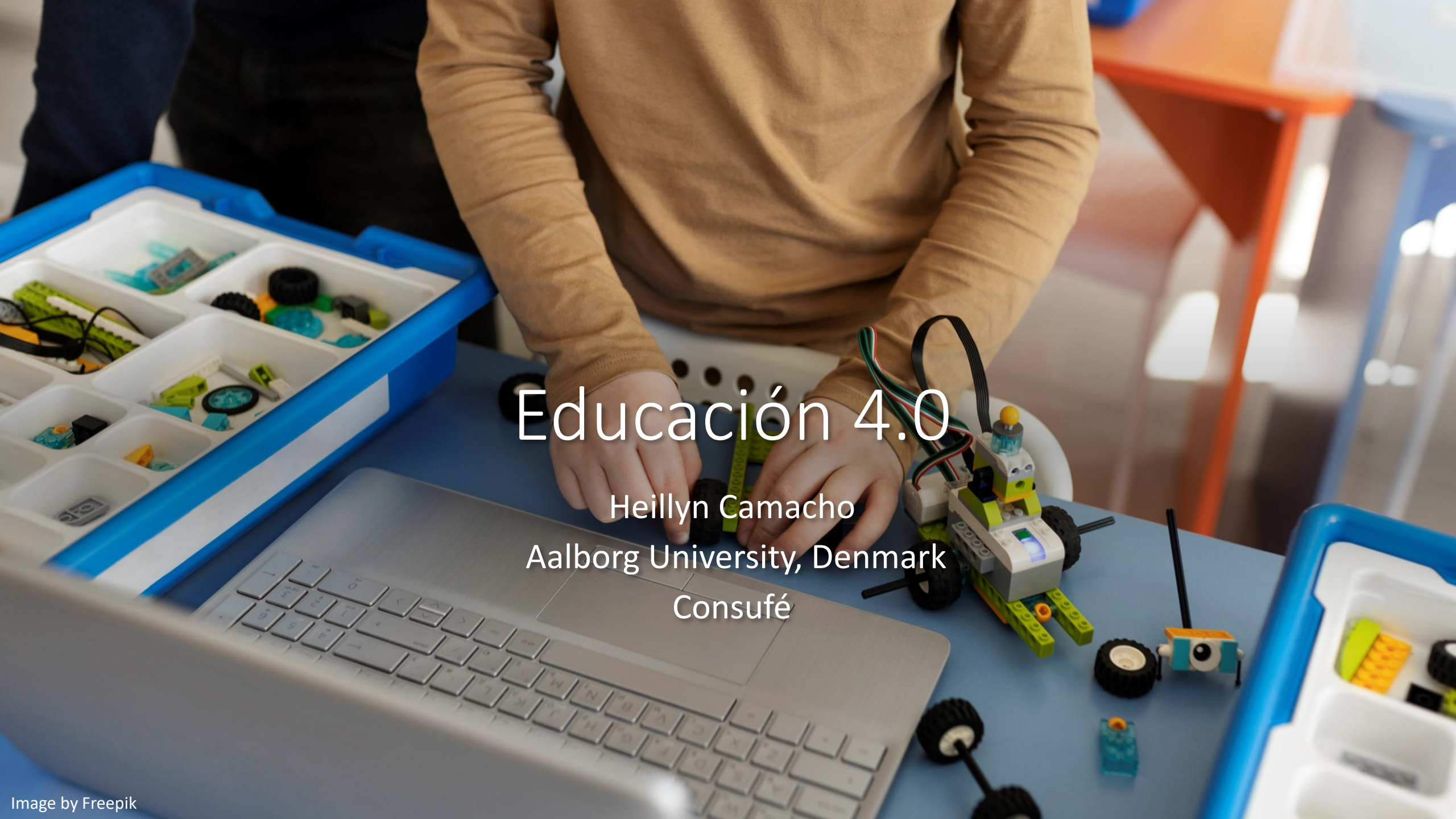


Educación 4.0

Heillyn Camacho
Aalborg University, Denmark
Consufé

Image by Freepik

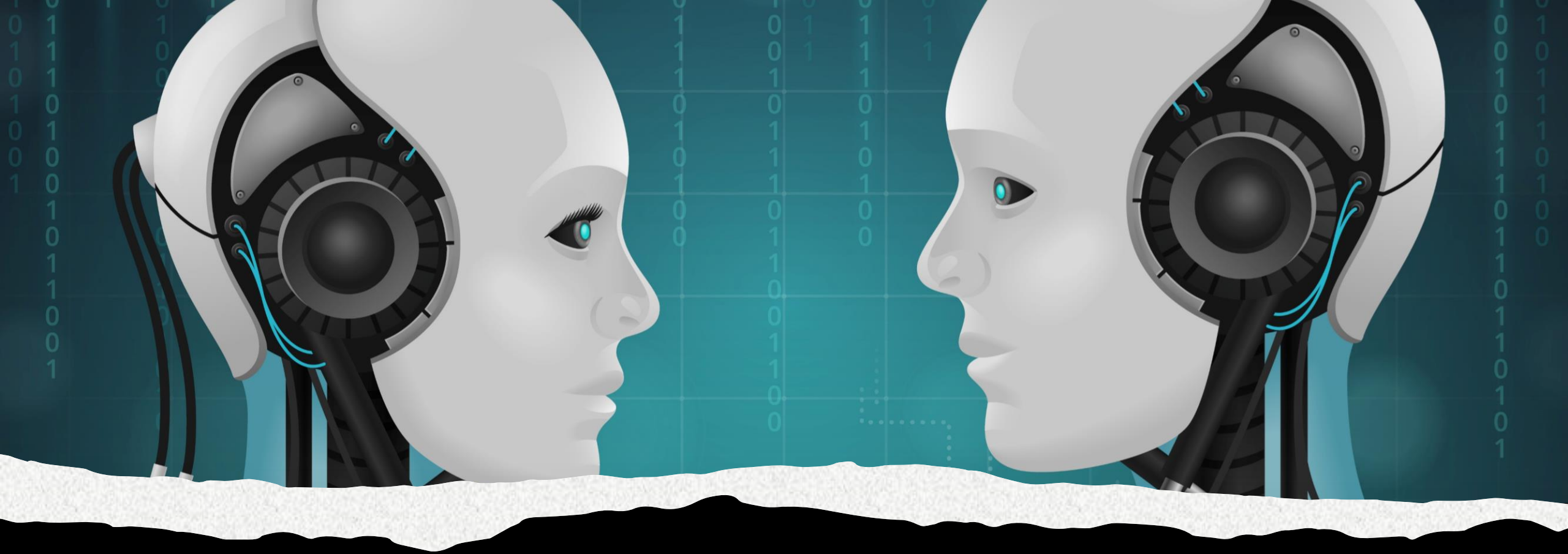
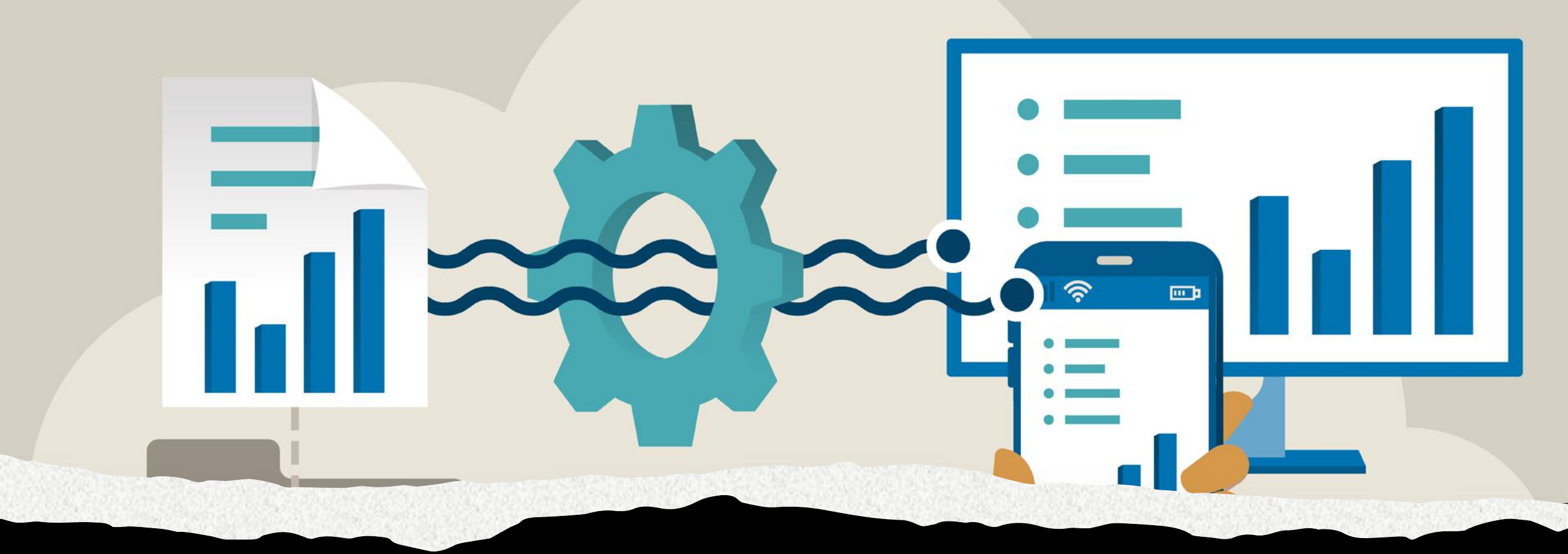


Image by macrovector on Freepik



Transformación Digital

Image by Freepik

Digital = Tecnología

Digital = Tecnología

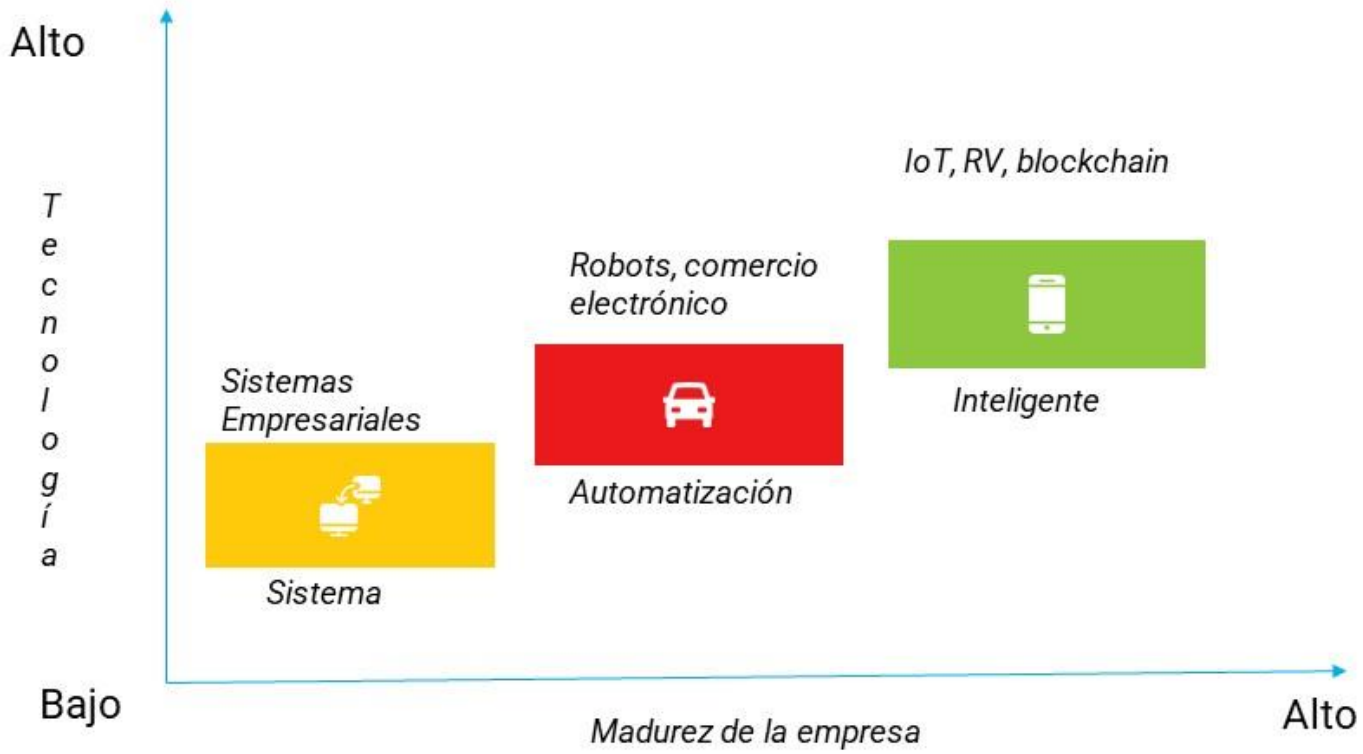
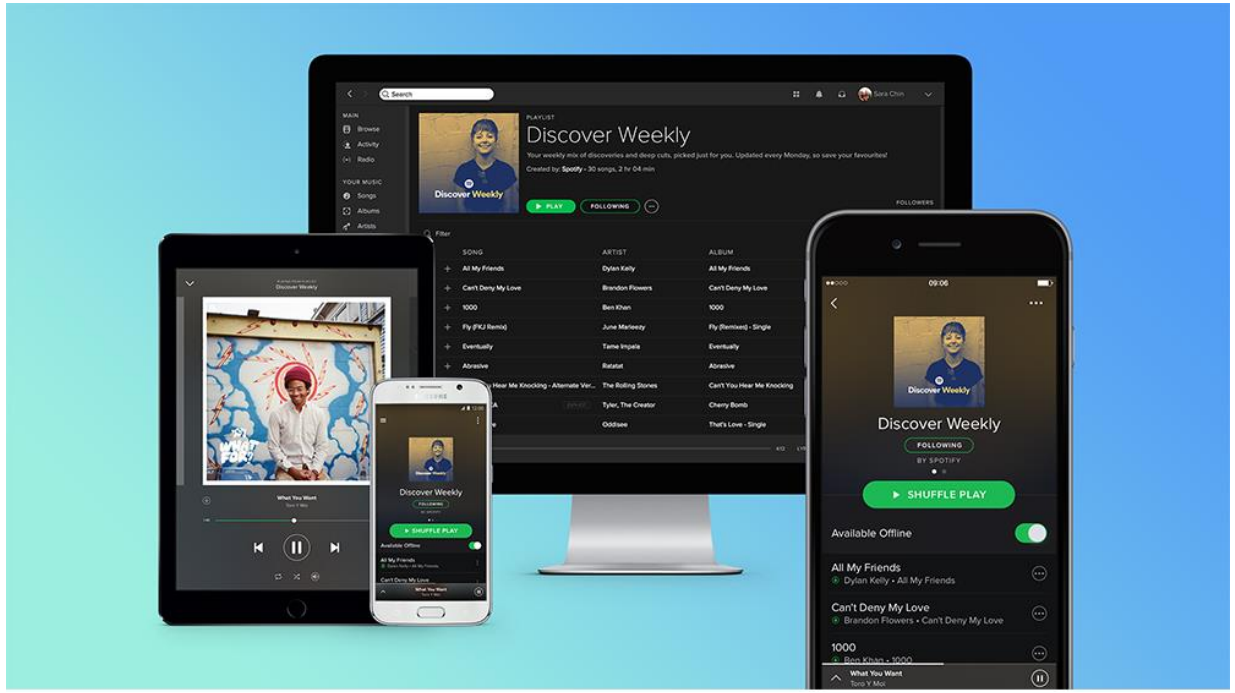


Image by Freepik

Tranformación digital …



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Cuarta Revolución Industrial

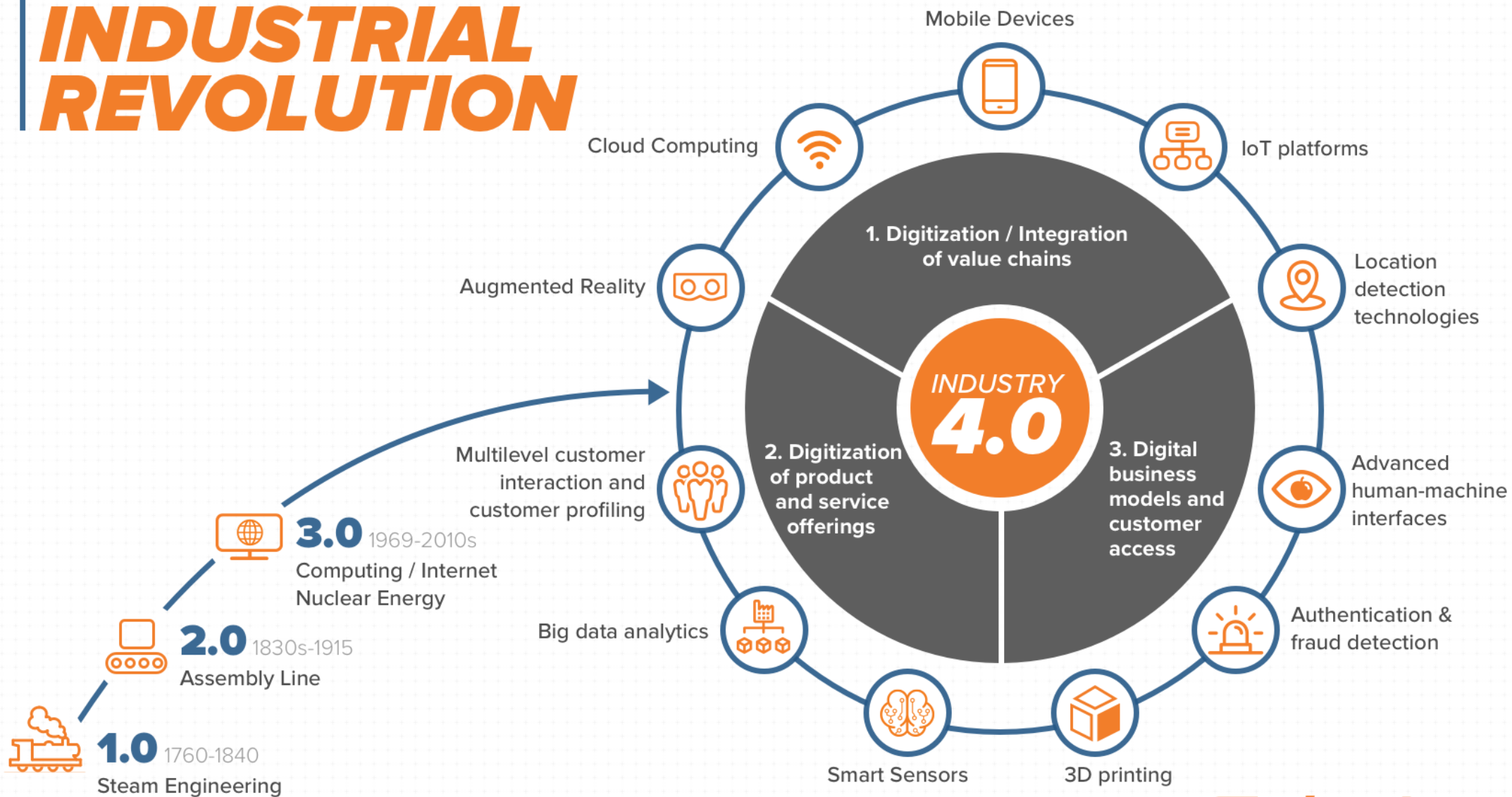
"La Cuarta Revolución Industrial representa un cambio fundamental en la forma en que **vivimos**, **trabajamos** y nos **relacionamos**. Es un nuevo capítulo en el desarrollo humano, posibilitado por extraordinarios avances tecnológicos (…). Estos avances están fusionando los mundos físico, digital y biológico en formas que crean tanto una gran **promesa** como un **peligro** potencial. La velocidad, amplitud y profundidad de esta revolución nos obliga a repensar cómo se desarrollan los países, cómo las organizaciones crean valor e incluso qué significa ser humano."

La Cuarta Revolución Industrial es algo más que un simple cambio impulsado por la tecnología ….

Fuente: https://www.weforum.org/focus/fourth-industrial-revolution

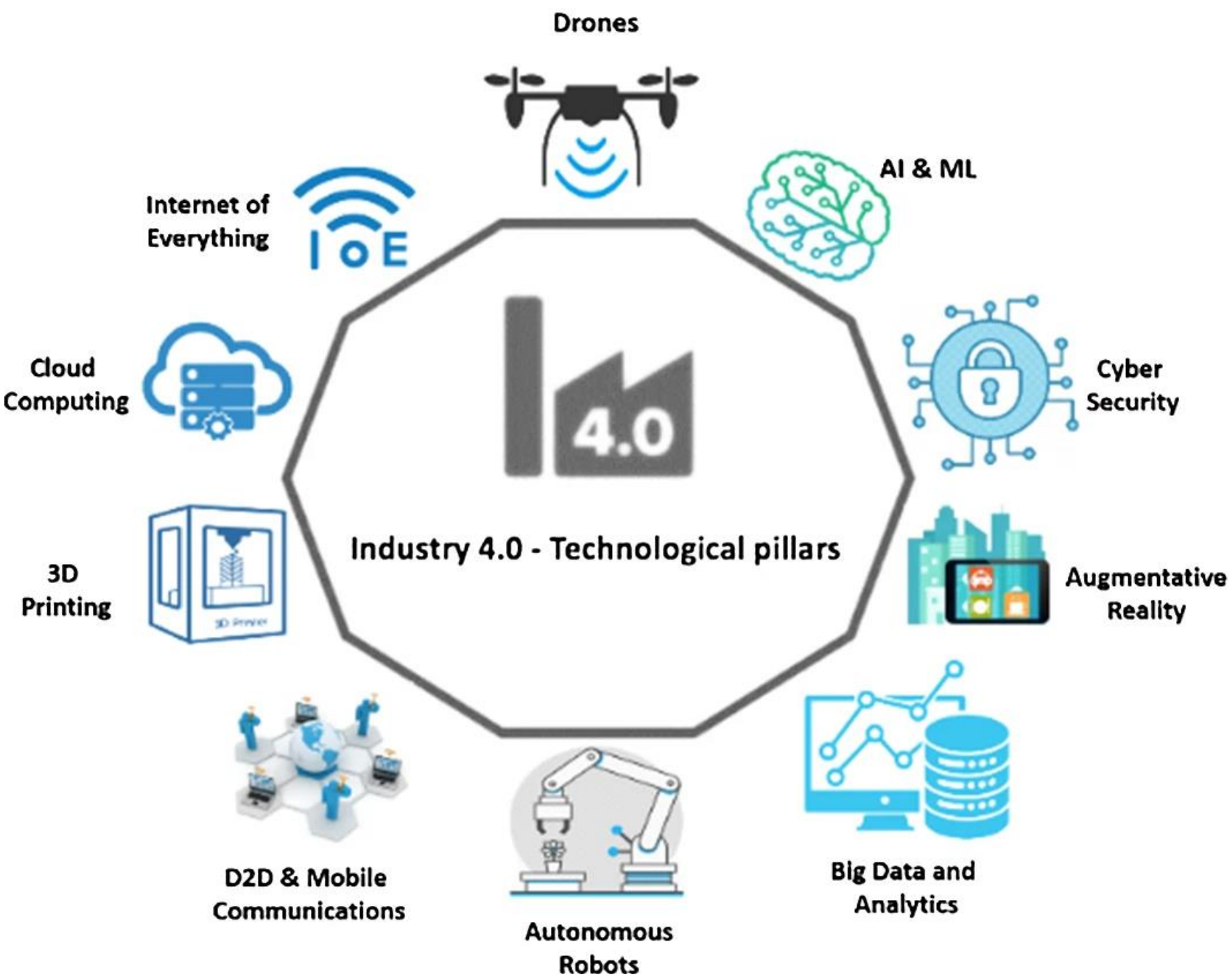
THE DAWN OF THE

FOURTH INDUSTRIAL REVOLUTION



https://www.weforum.org/agenda/2019/01/the-fourth-industrial-revolution-needs-new-forms-of-leadership/

shockoe™
Enterprise Mobile Solutions
Apps for the Fourth Industrial Revolution



Almalki, F.A., Alotaibi, A.A. & Angelides, M.C. Coupling multifunction drones with AI in the fight against the coronavirus pandemic. *Computing* **104**, 1033–1059 (2022). https://doi-org.zorac.aub.aau.dk/10.1007/s00607-021-01022-9

Open automation architecture

Robotic process automation

Cloud robotics

Cuarta Revolución Industrial

Educación 4.0

Top 10 skills of 2023

WORLD ECONOMIC FORUM

1. Analytical thinking	6. Technological literacy
2. Creative thinking	7. Dependability and attention to detail
3. Resilience, flexibility and agility	8. Empathy and active listening
4. Motivation and self-awareness	9. Leadership and social influence
5. Curiosity and lifelong learning	10. Quality control

Type of skill

Cognitive skills · Self-efficacy · Management skills · Technology skills · Working with others

Source
World Economic Forum, Future of Jobs Report 2023.

Note
The skills judged to be of greatest importance to workers at the time of the survey

Competencias

Image by Freepik

Educación 4.0

“Es un marco educativo que incorpora estratégicamente competencias como matemáticas, modelado, IA, simulación, ML, IoT, aprendizaje profundo, big data, red neuronal, sistema de fabricación, robótica, motivación, nube, etc. en la experiencia de aprendizaje, para que coincida con los requisitos actuales de Industria 4.0”. Chakraborty et al. 2023

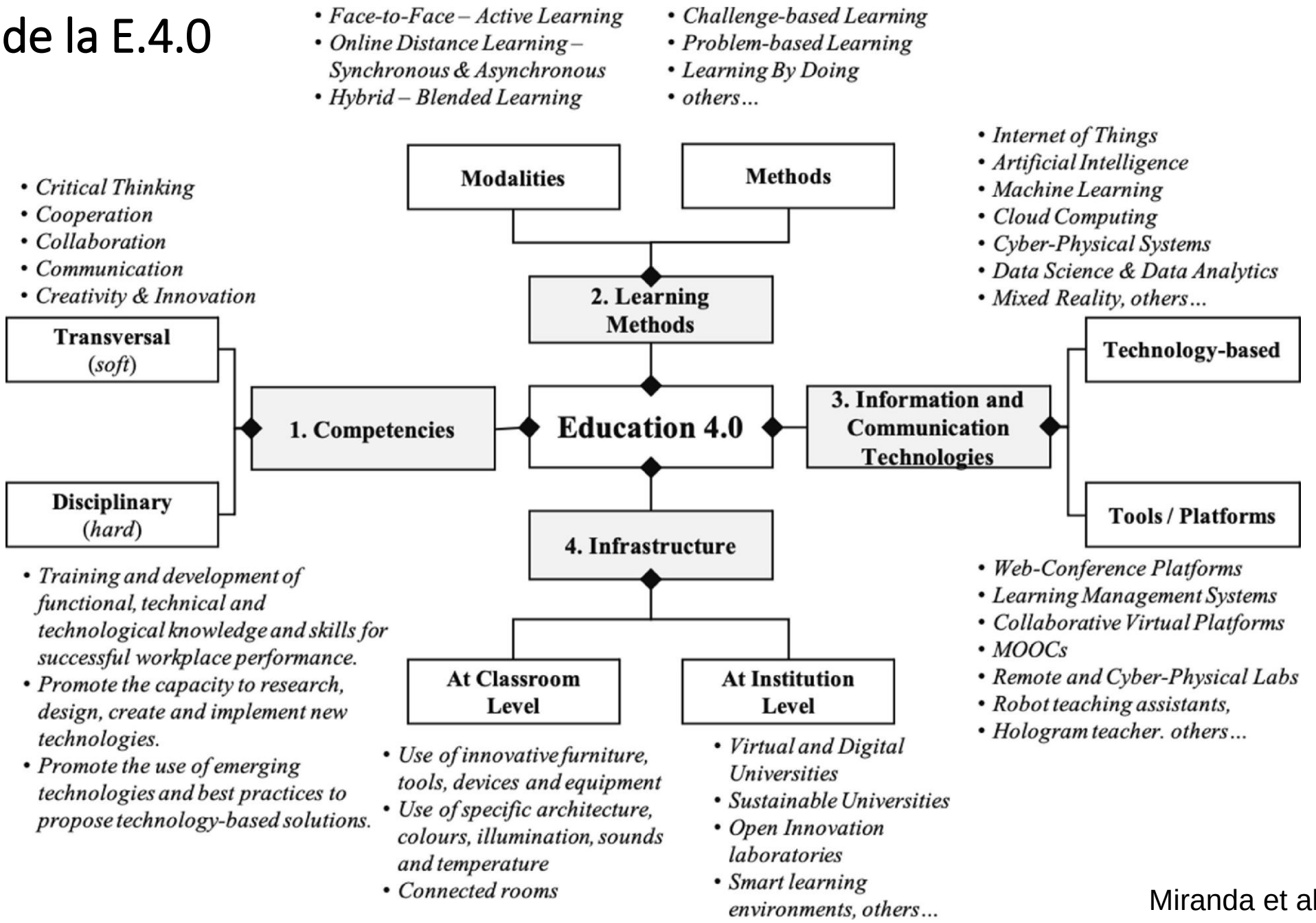
“Un enfoque para reinventar la educación de una manera que sea inclusiva, …” Foro Económico Mundial

“La Educación 4.0 es el período actual en el que las instituciones de Educación Superior aplican **nuevos métodos de aprendizaje**, herramientas didácticas y de gestión innovadoras, e **infraestructura inteligente y sostenible**, complementada principalmente con TIC nuevas y emergentes para mejorar los **procesos de generación de conocimiento y transferencia de información**. La combinación de estos recursos durante los procesos de enseñanza-aprendizaje apoyará la formación y el desarrollo de competencias críticas deseables en los estudiantes de hoy.” Miranda et al. 2021

	Education 1.0	Education 2.0	Education 3.0	Education 4.0
Period	Late 18th Century	Early 20th Century	Late 20th Century	Present
Philosophy	Essentialism, behaviorism, and instructivism	Andragogical, constructivist	Heutagogical, connectivist	Heutagogical, peeragogical and cybergogical
Educator role	Sage	Guide, information source	Orchestrator, curator and collaborator	Mentor, coach, collaborator, reference
Student role	Largely passive	Emerging active "owning of the knowledge"	Active, "Knowledge ownership", initial independence	Active, high independence, trajectory designer
Approach	Teacher-centered	Peer assessment encouraged, high teacher importance	Co-constructed, first student-centered	Mostly student-centered
Learning outcome	Grades, graduation degree	License to professional practicing	Prepared for practice and scenario analysis	Training of key competencies both soft and hard
Enablers	Mechanical printing, graphite pencil, ballpoint pen, typewriter	First computers, electronic devices and calculators	Computers and widespread use of the internet	ICTs tools and platforms powered by IoT
Information source	Standard texts	Adopted texts and open-source material (physical)	Texts, case studies, second hand experience	Based on online sources
Facilities	Universities / classrooms	Blended laboratories and classrooms	Blended and flexible physical shared spaces	Cyber and physical spaces both shared and individual
Industrial technology	Mechanical systems, steam powered	Mass production, industrialization and electricity	Internet access, automatization and control	Connectivity, digitalization and virtualization

Miranda et al. 2021

Componentes de la E.4.0



Miranda et al. 2021


airbnb

Fastest growing vs. fastest declining jobs

Top 10 fastest growing jobs

1.	AI and Machine Learning Specialists
2.	Sustainability Specialists
3.	Business Intelligence Analysts
4.	Information Security Analysts
5.	Fintech Engineers
6.	Data Analysts and Scientists
7.	Robotics Engineers
8.	Electrotechnology Engineers
9.	Agricultural Equipment Operators
10.	Digital Transformation Specialists

Top 10 fastest declining jobs

1.	Bank Tellers and Related Clerks
2.	Postal Service Clerks
3.	Cashiers and ticket Clerks
4.	Data Entry Clerks
5.	Administrative and Executive Secretaries
6.	Material-Recording and Stock-Keeping Clerks
7.	Accounting, Bookkeeping and Payroll Clerks
8.	Legislators and Officials
9.	Statistical, Finance and Insurance Clerks
10.	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers

Source
World Economic Forum, Future of Jobs Report 2023.

Note
The jobs which survey respondents expect to grow most quickly from 2023 to 2027 as a fraction of present employment figures

Largest growth vs. largest declining jobs

WORLD ECONOMIC FORUM

Top 10 largest growth jobs

1.	Agricultural Equipment Operators
2.	Heavy Truck and Bus Drivers
3.	Vocational Education Teachers
4.	Mechanics and Machinery Repairers
5.	Business Development Professionals
6.	Building Frame and Related Trades Workers
7.	University and Higher Education Teachers
8.	Big Data Specialists
9.	Sheet and Structural Metal Workers, Moulders and Welders
10.	Special Education Teachers

Top 10 largest decline jobs

1.	Data Entry Clerks
2.	Administrative and Executive Secretaries
3.	Accounting, Bookkeeping and Payroll Clerks
4.	Security Guards
5.	Building Caretakers and Housekeepers
6.	Cashiers and Ticket Clerks
7.	Material-Recording and Stock-Keeping Clerks
8.	Assembly and Factory Workers
9.	Postal Service Clerks
10.	Bank Tellers and Related Clerks

Source
World Economic Forum, Future of Jobs Report 2023.

Note
The jobs for which employment figures are expected to increase or decrease most quickly in real terms from 2023 to 2027 when survey responses are

Top 10 skills of 2023

WORLD ECONOMIC FORUM

1. Analytical thinking
2. Creative thinking
3. Resilience, flexibility and agility
4. Motivation and self-awareness
5. Curiosity and lifelong learning
6. Technological literacy
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Type of skill

Cognitive skills | Self-efficacy | Management skills | Technology skills | Working with others

Source
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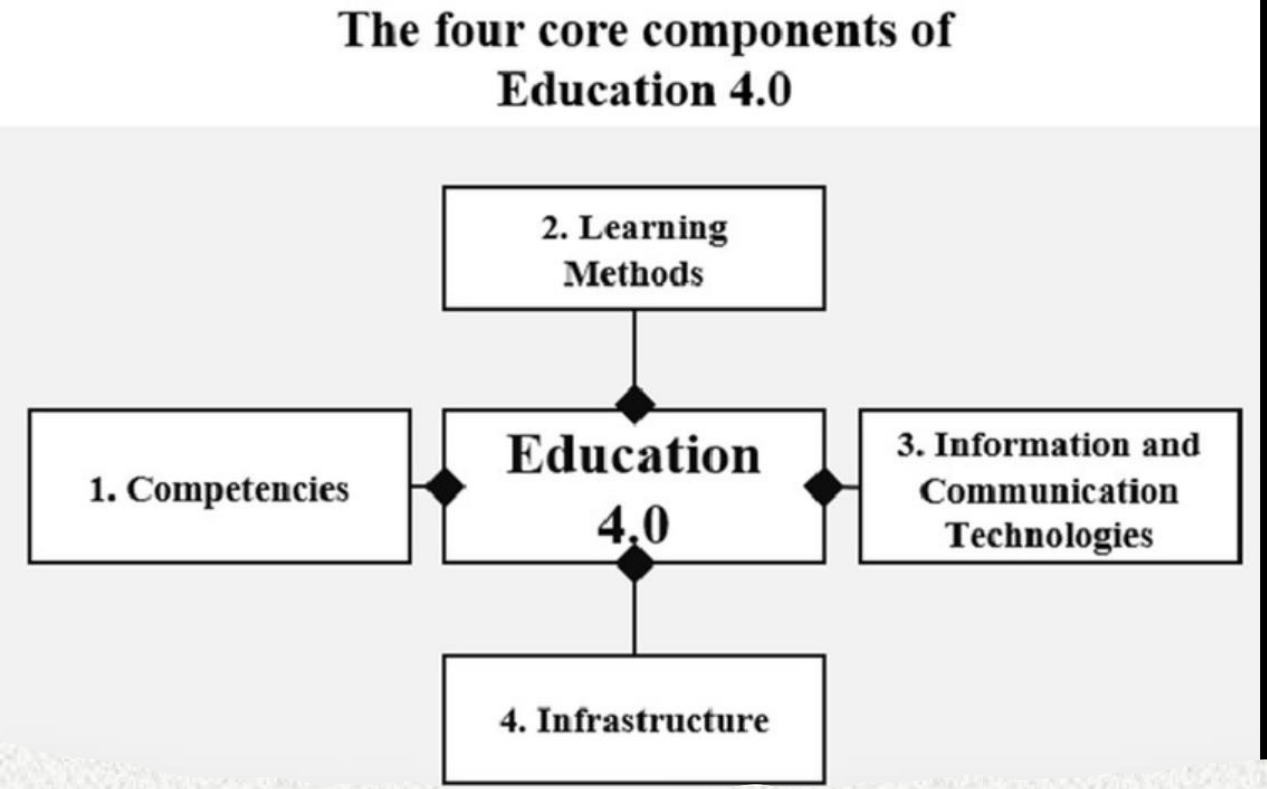
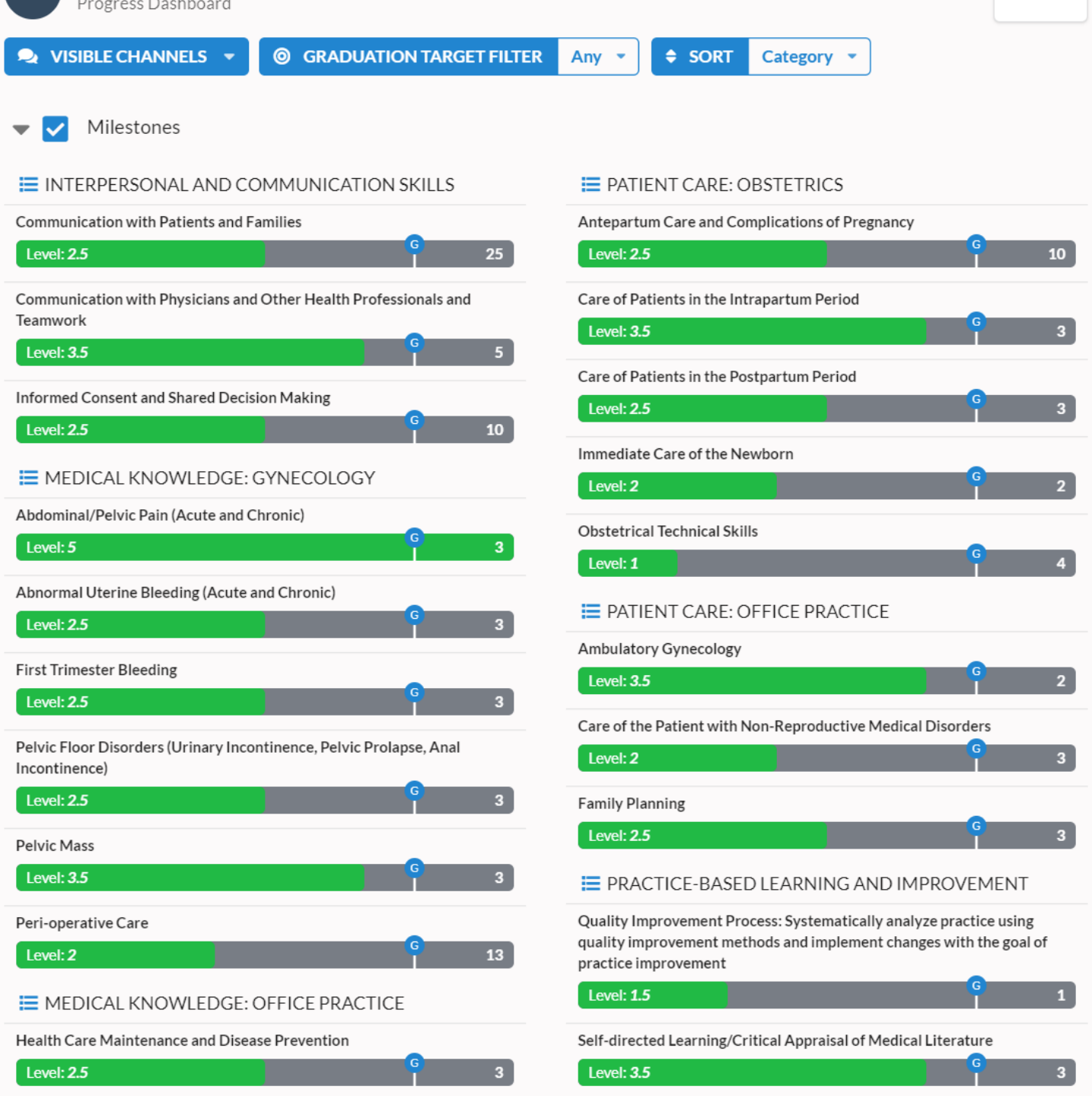
The skills judged to be of greatest importance to workers at the time of the survey



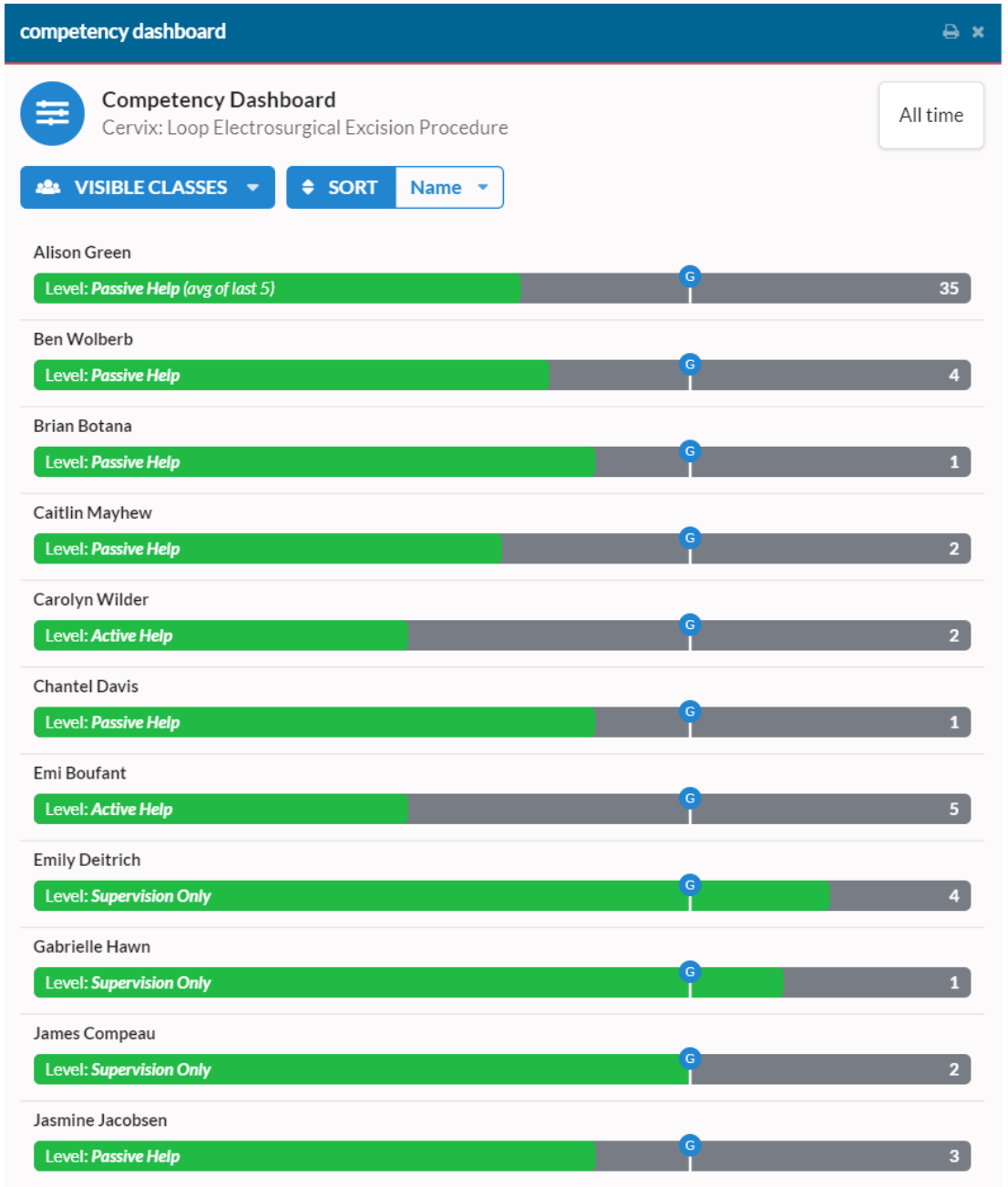
Ejemplos

- Mega proyectos - AAU



- Decisiones informadas
- Centrado en el estudiante
- Autogestión del aprendizaje
- Aprendizaje personalizado

https://mytipreport.org/



https://mytipreport.org/

Teachers as designer

Image by rawpixel.comon Freepik

Teachers as Designers Mindsets

 Problem Solving	 Empathy and human centeredness	 Confidence	 Learning Oriented
 Experimentation	 Motivation and Optimism to create value	 Ethics and Responsability	 Vistual Thinking
 Creativity	 Uncertainty, ambiguity and Risk	Emotional Intelligence	 Collaboration, Openness, and Diversity

Trabajo en progreso del proyecto Teachers as Designers mindset - Financiado por la UE.

Image by Freepik

Heillyn Camacho

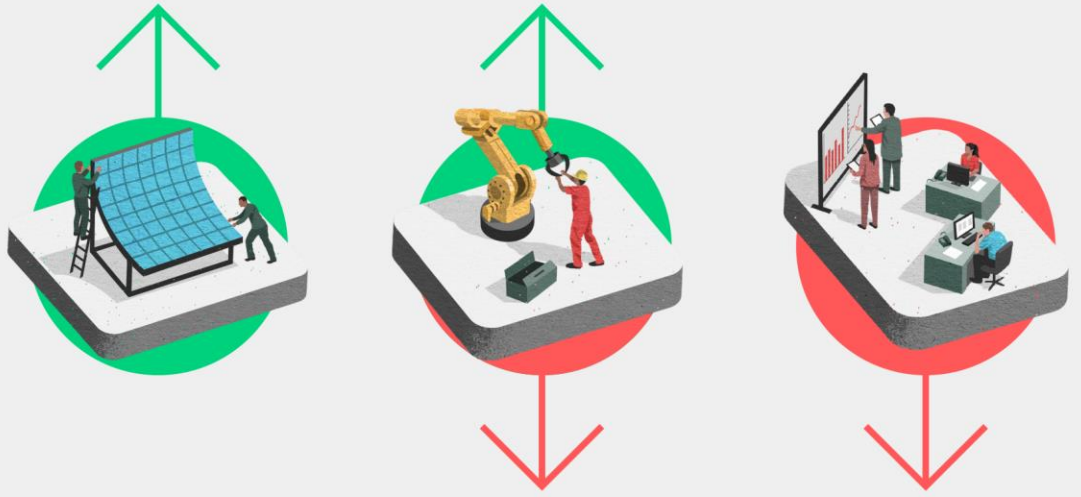
hcamacho@consufe.com
hcamacho@hum.aau.dk

Competencias – El reporte del future del trabajo 2023

Future of Jobs

Three key drivers of job change

WORLD ECONOMIC FORUM



Green transition

Technology

Economic outlook

Impact ↑ Driving job growth ↓ Driving job decline

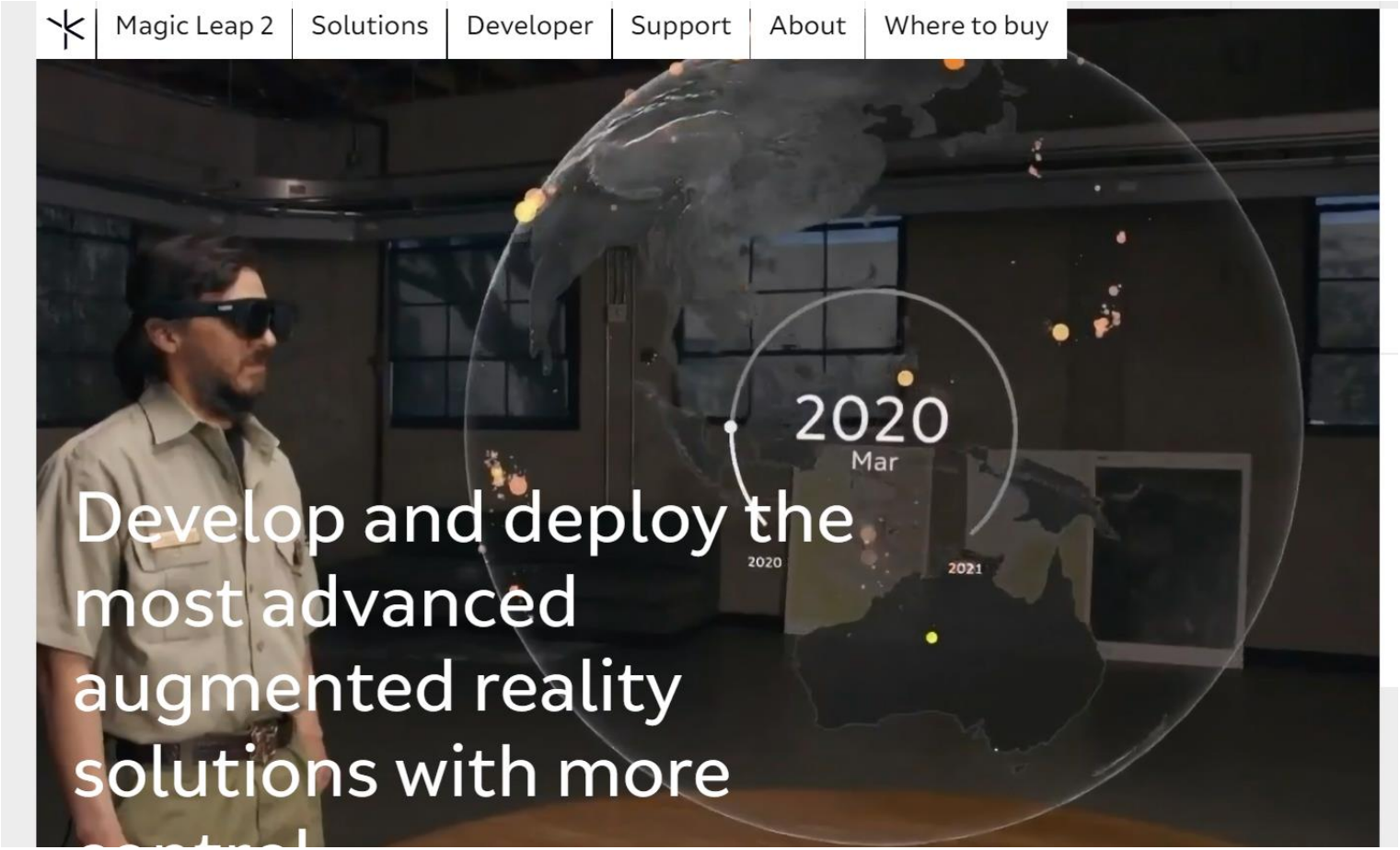
Source: World Economic Forum, *Future of Jobs Report 2023*.

Robots / IA

H.E.A.R.T PROJECT

Genie, Deakin Uni's virtual assistant for students

Realidad aumentada – Magic Leap



Escenarios

- *1 – An emerging focus on Future Skills radically changes the current definition of graduate attributes in higher education:* The focus on a "next mode" of studying (focus on *Future Skills*: autonomous learning, self-organization, applying and reflecting knowledge, creativity and innovation, etc.) gradually replaces a reduced/ narrow focus on academic and valid knowledge acquisition as a means to provide correct answers for known questions based on a curriculum which is focused on defined skills for fixed professions.
- *2 – Higher education increasingly becomes a multi-institutional study experience*: The provision of higher education increasingly moves from a 'one-institution' model to a 'multi-institution' model in which higher education is provided through alliances of several institutions.
- *3 – Students build their own personalized curriculum:* The elements of choice in academic programs enlarge. The curriculum of academic programs moves from a fully predefined and 'up-front' given structure to a more flexible, personalized and participatory model in which students actively cooperate with professors/ teachers/ advisors in curriculum building of higher education programs.
- *4 – Higher education institutions turn towards providing offerings for lifelong higher learning services:* The current model of higher education, to prepare students (up front) for a future profession, is equally complimented with higher lifelong learning offerings.

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Recursos

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- https://www.weforum.org/whitepapers/defining-education-4-0-a-taxonomy-for-the-future-of-learning/
- https://www.ptc.com/en/about
- https://www.sweetrush.com/#
- https://www.3dicc.com/
- Deep learning: https://www.youtube.com/watch?v=QDX-1M5Nj7s&list=PLtBw6njQRU-rwp5__7C0oIVt26ZgjG9NI