"The world is now "at the beginning of a Fourth Industrial Revolution (4IR). Developments in genetics, artificial intelligence, robotics, nanotechnology, 3D printing and biotechnology...are all building on and amplifying one another. This will lay the foundation for a revolution more comprehensive and all-encompassing than anything we have ever seen."

World Economic Forum

- 4IR is "blurring the lines between the physical, digital, and biological spheres (Schwab).

- In this context, it should also be noted that **"Power is changing hands from dying hierarchies to living networks"** (Ferguson)
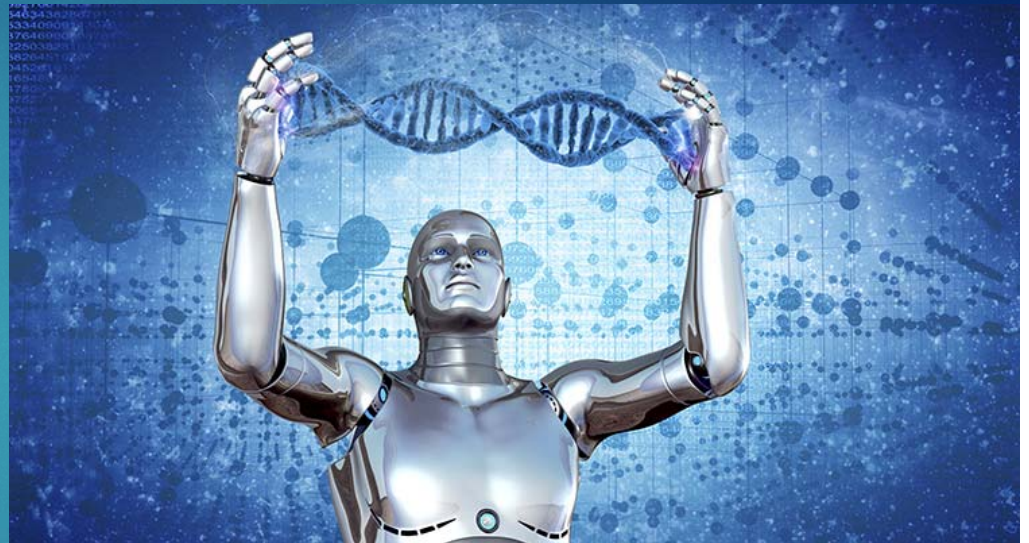
# Smart systems –

Networks in homes, factories, farms, grids or cities - will help tackle problems ranging from supply chain management to climate change.

The rise of the sharing economy will allow people to monetize everything from their empty house to their car.

Are educational institutions taking these challenges and opportunities sufficiently on board?

**Our Universities**: Designed mainly in the 19<sup>th</sup> and 20<sup>th</sup> centuries **are in need of substantial reform to address the realities of the 21<sup>st</sup> century** and beyond.
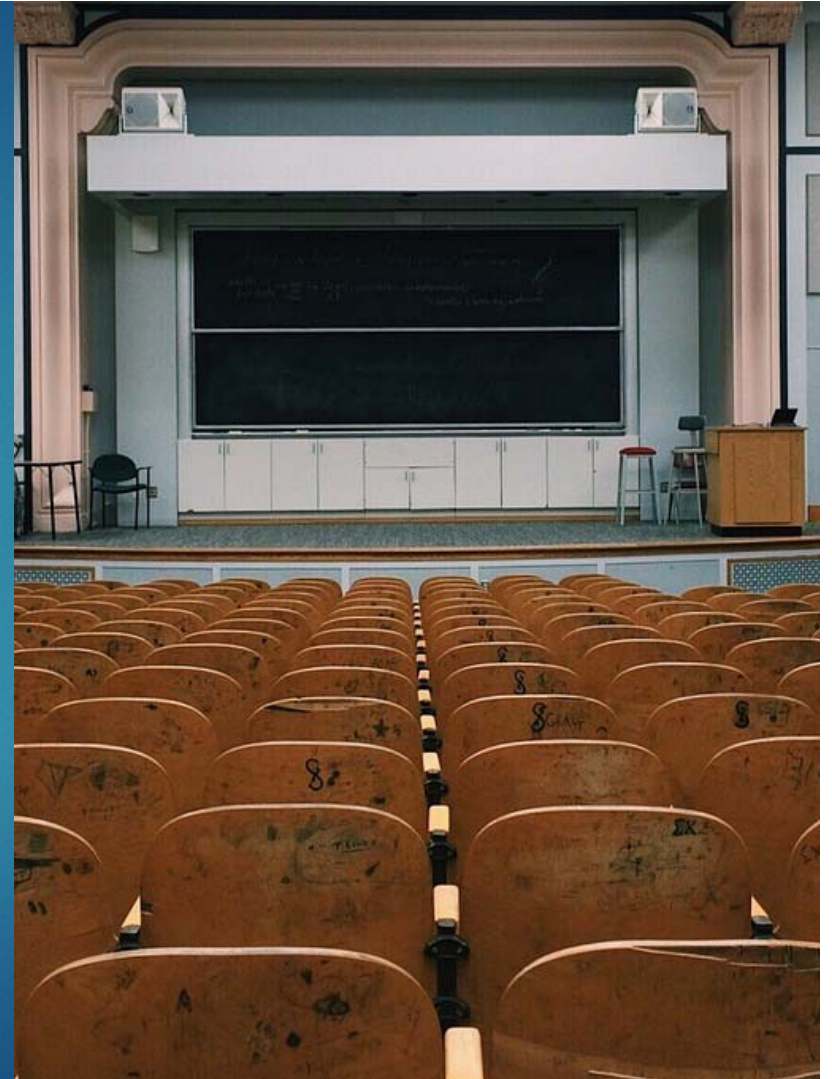
▶ Admission to universities is still mostly based on a high school system that classifies students into those pursuing Arts subjects and those pursuing **Science and Technology**

▶ At the same time, employers are increasingly looking for professionals with both sets of skills and attributes
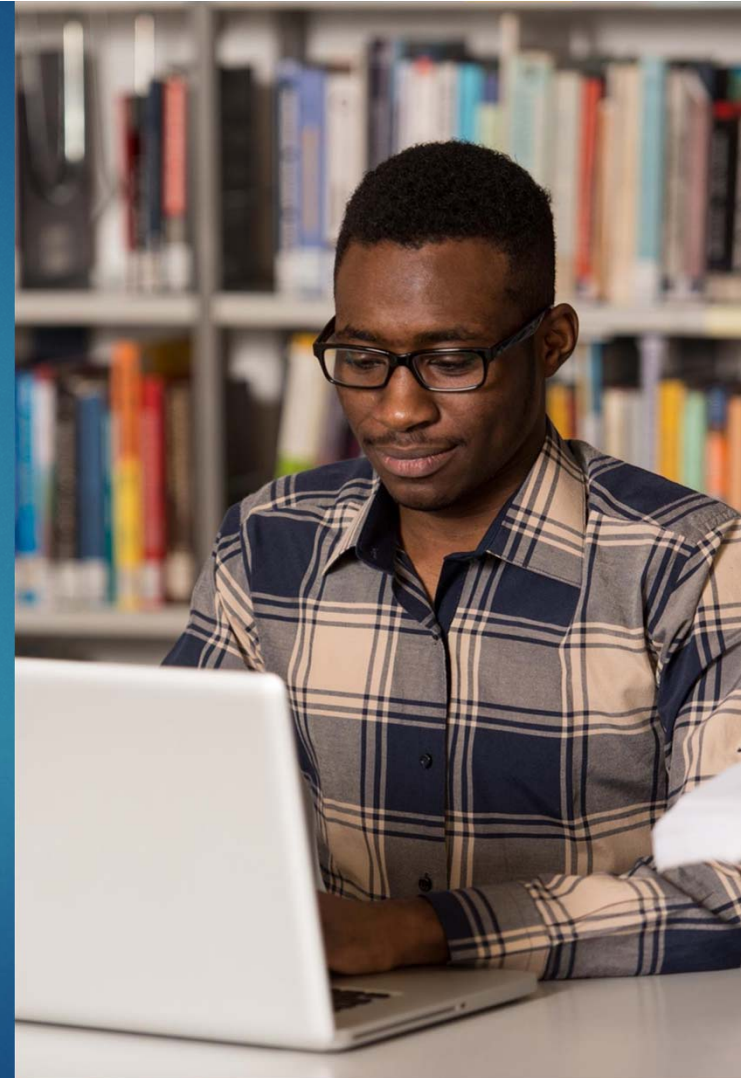
▶ This high school classification system frequently leads into gender and career streaming, with the majority of **girls or young women gravitating to studies in the Humanities and boys or young men heading in the direction of Science and Technology.**
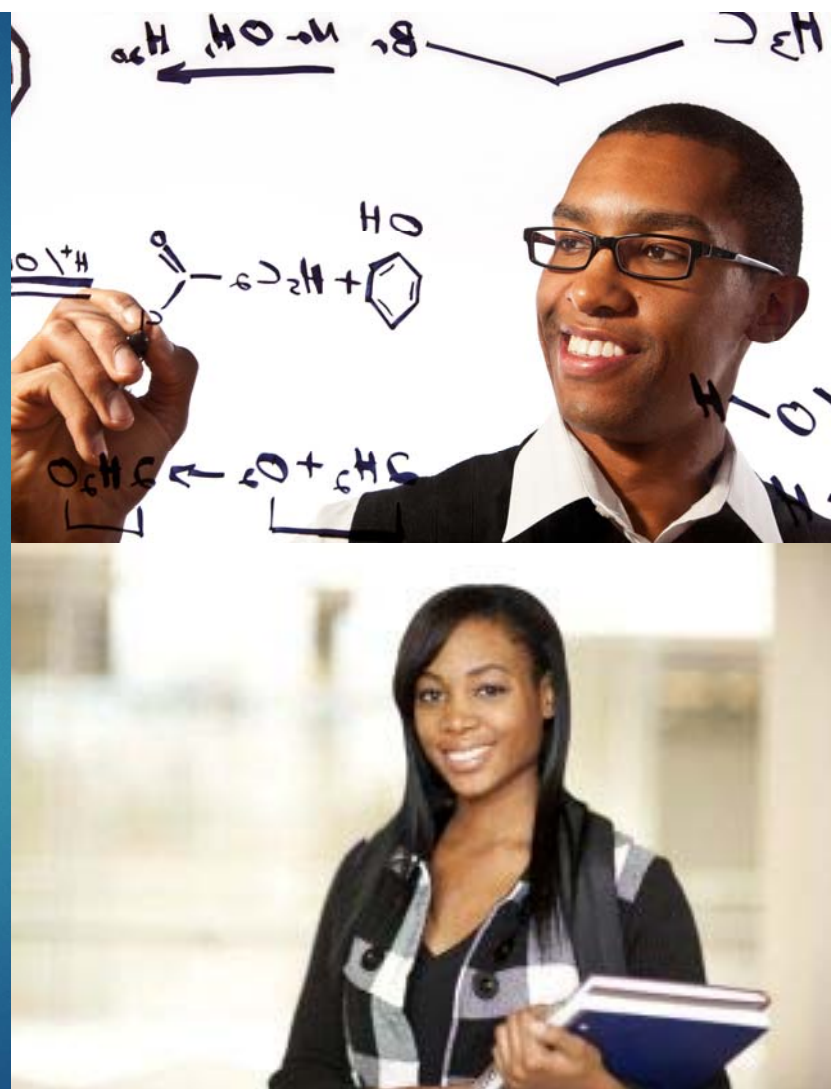
- The traditional College or University system concentrates too much on preparing for jobs and not enough on also mentoring own-account business leaders

- It also often leaves behind that cohort of high school students who did not excel in the traditional Arts or Science subjects based on the unreconstructed matriculation requirements of these universities and colleges.

- Such youth cohorts are often the most creative, flexible and hands-on group, capable of learning unconventional skills, leading news businesses and operating joint enterprises.

- Those students that get to University are classified into discipline specific faculties and subject specific departments that lead to narrowly focused, traditional career options
- Many students and employees are looking for new job types and different skillsets

# Top 10 skills

## in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

## in 2015
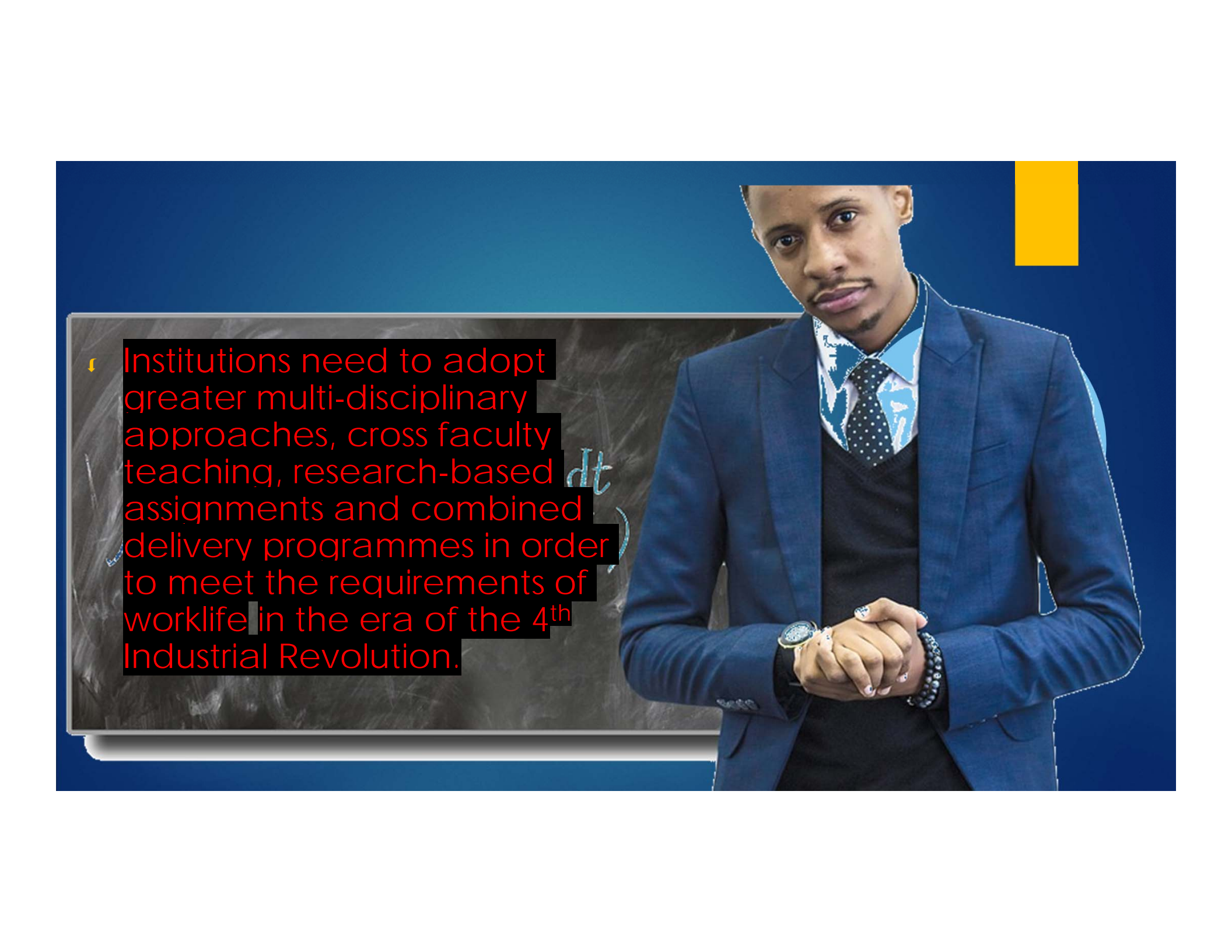
1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity

Source: Future of Jobs Report, World Economic Forum

- Institutions need to adopt greater multi-disciplinary approaches, cross faculty teaching, research-based assignments and combined delivery programmes in order to meet the requirements of worklife in the era of the 4th Industrial Revolution.

"Top ten 'in demand' jobs in 2010 often did not exist in 2004. **We are trying to educate students for jobs that don't yet exist, using technologies that haven't been invented in order to solve problems we don't know are problems yet**."

Source: Former US Secretary of Education Richard Riley

# Skills Disruption

Average

**35%** of core skills will change between 2015 and 2020

### Disruption across countries and industries

| | |
|---|---|
| 43% | Financial Services & Investors |
| 42% | Basic & Infrastructure |
| 39% | Mobility |

| | |
|---|---|
| 35% | Information & Communication Technology |
| 33% | Professional Services |
| 30% | Energy |
| 30% | Consumer |
| 29% | Health |
| 27% | Media, Entertainment & Information |

| | |
|---|---|
| 48% | Italy |
| 42% | India |
| 41% | China |
| 41% | Turkey |
| 39% | South Africa |
| 39% | Germany |
| 38% | France |
| 37% | Mexico |

average disruption

| | |
|---|---|
| 31% | Brazil |
| 29% | United States |
| 28% | United Kingdom |
| 27% | Australia |
| 25% | Japan |
| 21% | Gulf Cooperation Council |
| 19% | ASEAN |

Source: Future of Jobs Report, World Economic Forum

# Global Net Employment Effects

► Some routine white-collar office functions are at risk of being decimated with alternatively strong growth in areas such as Computing, Architecture, Fintech and Engineering.

► Surprisingly, many top employers in these STEM careers are now also seeking Arts and Humanities graduates with strong analytical and imaginative skills.

► Manufacturing and Production roles are expected to see a further bottoming out from robotics and machine learning.

► However there is the potential for upskilling, redeployment and **productivity enhancements** through new technology education rather than via pure career substitution.

# Jobs or Business Opportunities in Agriculture and Personal Care

▶ Future of Jobs remains incomplete without recognizing that a significant share of the Global South workforce remains employed in agriculture. This sector needs trained, modern skill-sets.

▶ There is also optimism about growth in Personal Care and Service jobs due to rising stress, fatigue and other occupational and social dysfunctions.

- To meet the demands of the future, Universities and Colleges need to ensure that their programmes develop new and diverse professional competences and interpersonal skills such as:
  - Entrepreneurship for innovators
  - Business and science ethics
  - Data mining and data analytics
  - Web management and cyber security,
  - Emotional intelligence and mindfulness.
  - Social care and behaviour change
  - Communication and Self presentation

# The Professional in a Knowledge Society



- Multi-tasker
- Competitive
- Multi-lingual
- Flexible, adaptable, versatile
- Possesses multiple literacies
- Displays Emotional Intelligence
- Educated and well-read
- Ethical

The 21st Century Professional

# Conclusions



- In the era of 4IR, universities and colleges need to radically re-examine their curricula towards producing graduates with skill-sets and knowledge that are more relevant to emerging industry needs and changing societal requirements

- The current technological revolution need not become a race between humans and machines but rather an opportunity for more productive and interactive work. (Schwab)

- "We are called to be architects of the future, not its victims" (Fuller)