# Education 4.0: Challenges and Directions

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**PATEF-UPDATE**

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*Professionalism*     *Integrity*     *Excellence*     *Service*

# OUTLINE OF PRESENTATION

a. GLOBAL TRENDS

b. The Imperatives for Education 4.0

c. Challenges and Directions
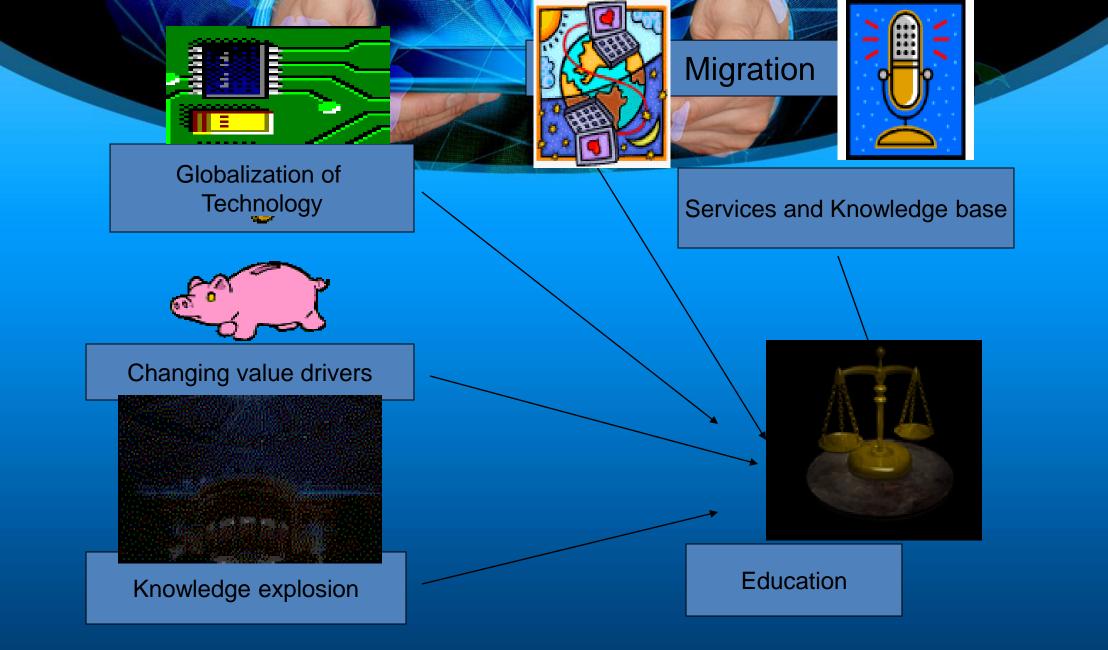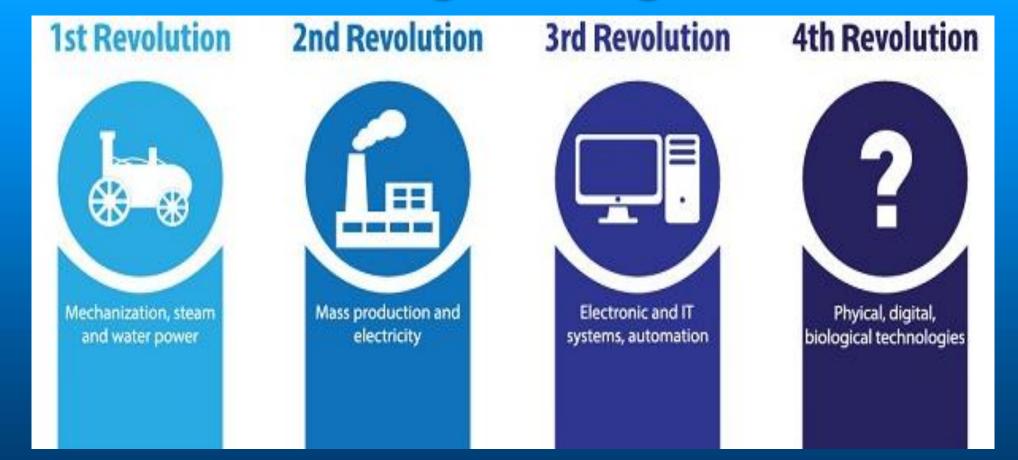
Migration

Globalization of Technology

Services and Knowledge base

Changing value drivers

Knowledge explosion

Education

# Things Change!



1st Revolution — Mechanization, steam and water power

2nd Revolution — Mass production and electricity

3rd Revolution — Electronic and IT systems, automation

4th Revolution — Phyical, digital, biological technologies

# V.U.C.A. WORLD

**volatility**

**Characteristics:** The challenge is unexpected or unstable and may be of unknown duration, but it's not necessarily hard to understand; knowledge about it is often available.

**uncertainty**

**Characteristics:** Despite a lack of other information, the event's basic cause and effect are known. Change is possible but not a given.

**complexity**

**Characteristics:** The situation has many interconnected parts and variables. Some information is available or can be predicted, but the volume or nature of it can be overwhelming to process.

**ambiguity**

**Characteristics:** Causal relationships are completely unclear. No precedents exist; you face "unknown unknowns."

https://hbr.org/2014/01/what-vuca-really-means-for-you

Our vuca world

# Emerging Technologies

the Internet of Things
big data analytics
artificial intelligence
neurotechnologiesm
nano- or microsatellites
nanomaterials
additive manufacturing,
advance energy storage technologies
synthetic biology
blockchain

# AMAZING FAT GUY

amazon

Apple

Alibaba Group

**F**acebook

**A**irbnb

**T**witter

**G**oogle

**U**ber

**Y**outube

Did not exist in 2006

**Time it took to reach**

**100 million** customers

75 years

7 years

4 years

1 month

Expected timeframe of key disruption drivers impacting industries and employment

**Impact felt already**

- Mobile internet, cloud technology and big data
- Flexible work arrangements
- Rising geopolitical volatility
- Growing middle class, emerging young demographics and middle classes
- Rapid urbanization
- Climate change and transition to a greener economy

**2015-17**

- New technologies such as Internet of Things (IoT)
- Advanced manufacturing and three-dimensional (3D) printing
- Longevity and aging society
- Rising consumer expectations and privacy issues
- Women's rising aspirations and economic power

**2018-20**

- Advanced robotics and autonomous transport
- Artificial intelligence and machine learning
- Advanced materials, biotechnology and genomics

# 10 Jobs that Didn't Exist 10 Years Ago!

We examined over **259,000,000** LinkedIn members' profiles to determine the 10 most popular job titles that were barely on the map in 2008. Technology and fitness are the biggest drivers for these fascinating changes.

**1 THE IOS DEVELOPER**
Apple announced the iPhone in 2007, and 3rd party development for iOS took off in 2008 with the release of iOS 2 and the App Store.
2008 | 89
2013 | 12,634
142x growth in 5 years

**2 THE ANDROID DEVELOPER**
Google's Android platform was also announced in 2007, with the release of the first Android-powered handset in 2008.
2008 | 53
2013 | 10,554
199x growth in 5 years

**3 THE ZUMBA INSTRUCTOR**
Zumba started in the early 2000's and quickly gained traction in 2007 as fitness centers started popping up all over the US.
2008 | 16
2013 | 6,331
396x growth in 5 years

**4 THE SOCIAL MEDIA INTERN**
LinkedIn, Facebook, YouTube and Twitter were all founded between 2003 and 2006. These networks really started hitting their stride after 2008 and are currently at peak popularity. Not a shocker that this is a surging profession.
2008 | 25
2013 | 4,350
174x growth in 5 years

**5 THE DATA SCIENTIST**
Our digital lives have created an overwhelming flood of information. In the last 5 years, data scientists have come to the rescue by trying to make sense of it all.
2008 | 142
2013 | 4,326
30x growth in 5 years

**6 THE UI/UX DESIGNER**
User interface and user experience designers focus on making our technology pleasant and intuitive to use. Seeing as our lives depend on interacting with technology, it's no small wonder UI/UX designers are in hot demand.
2008 | 159
2013 | 3,509
22x growth in 5 years

**7 THE BIG DATA ARCHITECT**
Although it's been around for at least 2 decades, the concept of big data took off around 2008. That year, the Computing Community Consortium published a white paper which propelled the term into the limelight.
2008 | 0
2013 | 3,440
3,440 x growth in 5 years

**8 THE BEACHBODY COACH**
Beachbody coaches are distributors of fitness products produced by Beachbody LLC, the most famous of which is P90X, launched in 2004.
2008 | 0
2013 | 3,360
3,360 x growth in 5 years

**9 THE CLOUD SERVICES SPECIALIST**
Salesforce.com and Amazon were the 2 companies that introduced cloud computing to businesses throughout the early 2000s. The stark contrast in the number of jobs shows how popular and reliable cloud services have become.
2008 | 195
2013 | 3,314
17x growth in 5 years

**10 THE DIGITAL MARKETING SPECIALIST**
Social media and digital marketing have become significant facets of many businesses (and we're pretty glad that's the case!)
2008 | 166
2013 | 2,886
17x growth in 5 years

http://skillspanorama.cedefop.europa.eu/en/news/infographic-jobs-did-not-exist-10-years-ago

https://wearetop10.com/best-quadcopter-drones/

Uber Driver
Blogger
YouTuber
Drone operators
Social media consultant
Data miner/scientist
Sustainability manager
Professional hacker

AI engineer
Pro-gamer
SEO analyst
Podcast producer
Content moderator
Virtual assistant
Driverless car engineer
Genetic counselor

# THE 6 DRIVERS OF CHANGE

**EXTREME LONGEVITY**

PEOPLE ARE LIVING LONGER

By 2025 the number of americans over 60 will increase by 70%.

**THE RISE OF SMART MACHINES AND SYSTEMS**

TECH CAN AUGMENT AND EXTEND OUR OWN CAPABILITIES

Workplace automation is killing repetitive jobs.

**COMPUTATIONAL WORLD**

INCREASES IN SENSORS AND PROCESSING MAKES THE WORLD A PROGRAMMABLE SYSTEM

Data will give us the ability to see things on a scale that has never been possible.

**NEW MEDIA ECOLOGY**

NEW COMMUNICATION TOOLS REQUIRE MEDIA LITERACIES BEYOND TEXT

Visual communication media is becoming a new vernacular.

**SUPERSTRUCTURED ORGANIZATIONS**

SOCIAL TECHNOLOGIES DRIVE NEW FORMS OF PRODUCTION AND VALUE CREATION

Social tools are allowing organizations to work at extreme scales.

**GLOBALLY CONNECTED WORLD**

DIVERSITY AND ADAPTIBILITY IS AT THE CENTER OF OPERATIONS

The United States and Europe no longer hold a monopoly on job creation, innovation, and politcal power.

http://www.top10onlinecolleges.org/work-skills-2020/?fbclid=IwAR2F-FL0PPf_akBEXsY-zOdIIAxG4uH7tbS-xdeEYSzRRjpHKBlwrJor-yQ

# Challenges of Fourth Industrial Revolution

- Security issues of data and maintaining privacy

- Risk of greater inequality in labour markets

- Decrease in real income of workers as machines take over

- Displacement of workers by machines and artificial intelligence

- Creation of higher order human jobs is always a concern when automated technologies takeover day to day jobs

# Challenges and Directions

# Students are changing!

Always mobile, always moving.

**The learner of the future is more aroused and proactive due to high level of exposure and guidance available across different platforms.**

McKinsey&Company

MCKINSEY GLOBAL INSTITUTE

JOBS LOST, JOBS GAINED: WORKFORCE TRANSITIONS IN A TIME OF AUTOMATION

DECEMBER 2017

- Educational models have not fundamentally changed in 100 years; we still use systems designed for an industrial society to prepare students for a rapidly-changing knowledge economy.

https://www.mckinsey.com/global-themes/future-of-organizations-and-work/what-the-future-of-work-will-mean-for-jobs-
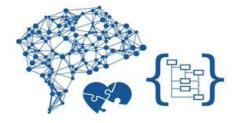
# New jobs will be created.
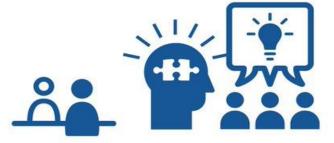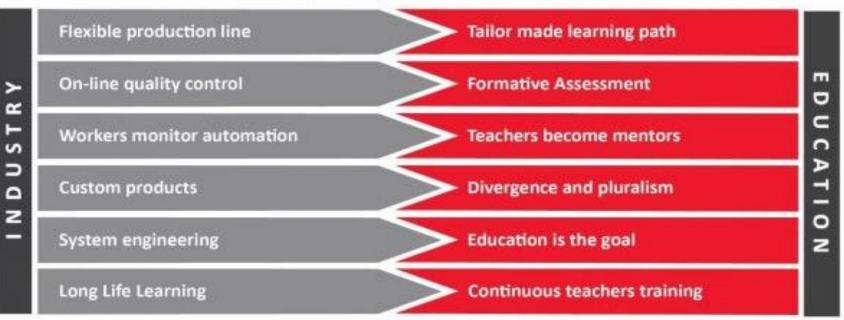
## in 2020

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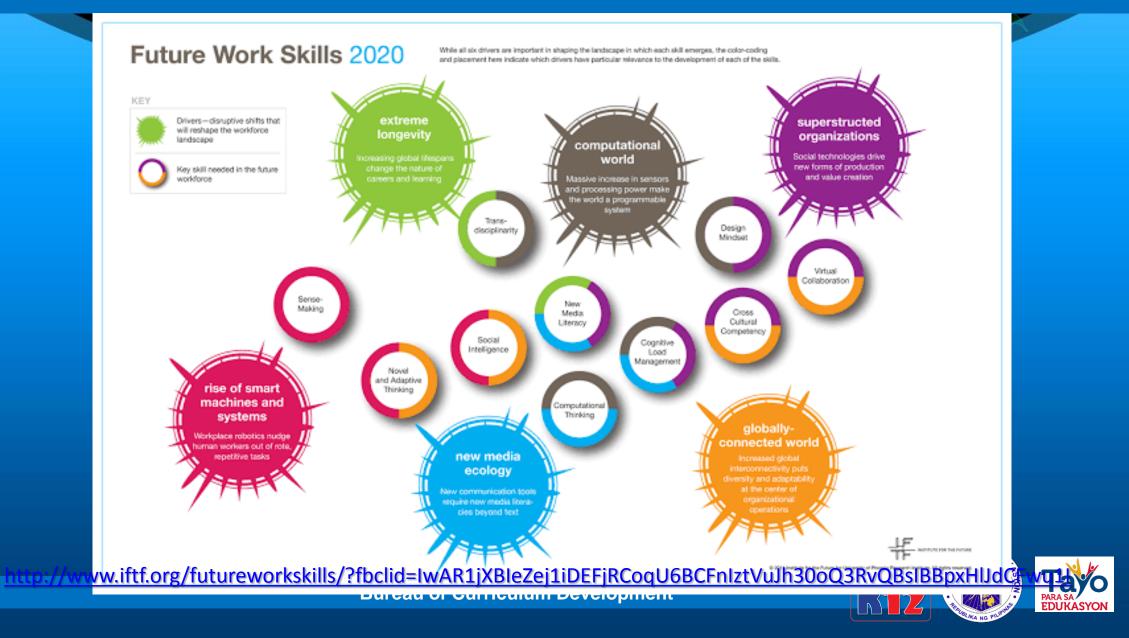
1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity

Source: Future of Jobs Report, World Economic Forum

Future Work Skills 2020

McKinsey&Company

MCKINSEY GLOBAL INSTITUTE

# JOBS LOST, JOBS GAINED: WORKFORCE TRANSITIONS IN A TIME OF AUTOMATION

DECEMBER 2017

- **an increasing percentage of activities that workers will do in the future will be in categories such as managing and leading other people and interacting with others, which require** skills such as social and emotional sensing and reasoning, and applying creativity and collaborative problem-solving.

# Education changes!

Our job is not to "prepare" kids for something;
Our job is to **help kids learn** to prepare
themselves for anything.

✑ *AJ Juliani*

# Aligning Education 4.0 with Industry 4.0



ALIGNING INDUSTRY REQUIREMENTS WITH EDUCATION

| INDUSTRY | EDUCATION |
| --- | --- |
| Flexible production line | Tailor made learning path |
| On-line quality control | Formative Assessment |
| Workers monitor automation | Teachers become mentors |
| Custom products | Divergence and pluralism |
| System engineering | Education is the goal |
| Long Life Learning | Continuous teachers training |

## Education 1.0
**(experience and memorization)**

Education was imparted on a person to person basis. This is limited in Scale and informal in nature.

## Education 2.0
**(internet-enabled)**

Invention of printing press allowed the masses to get access to basic education and brought in a culture of scientific inquiry.

## Education 3.0
**(Consuming and producing knowledge)**

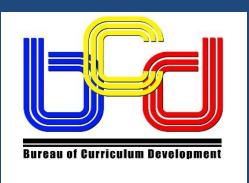The emergence of internet and IT changed the mode of delivery, providing a technology platform to learn.

## Education 4.0
**(empowering education to produce innovation)**

Puts the learner at the center of the culture ecosystem and empowers him/her to structure individual problem keeping in mind to the final outcome. Personalization of learning process, where the learner has complete flexibility to be the architect of his/her learning path and has the freedom to aspire for, approach and achieve personal goal by choice.
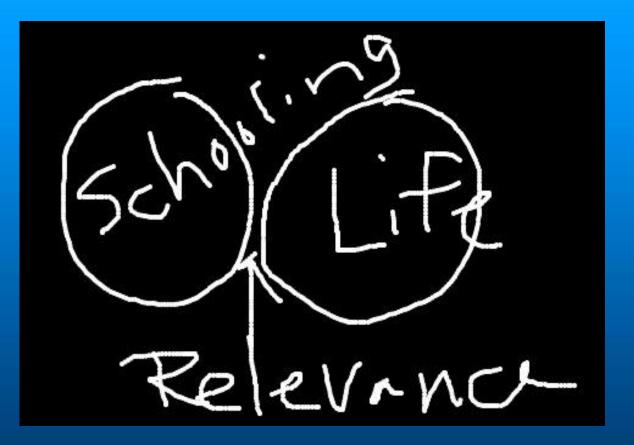
# Imperatives for Education 4.0

# The K to 12 Philippine Basic Education Curriculum Framework

Higher Education

Employment

Entrepreneurship

Middle Level Skills Development

## *Holistically Developed Filipino with 21st Century Skills*
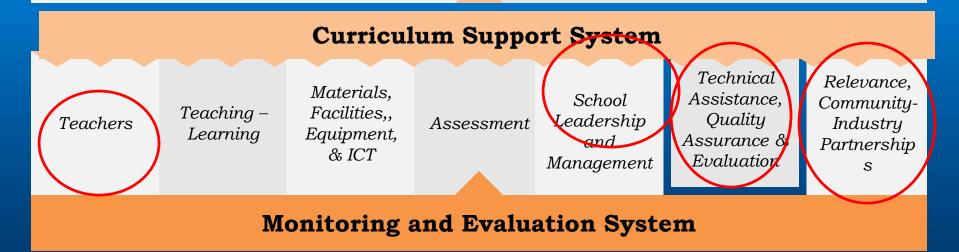
## Being and Becoming a Whole Person

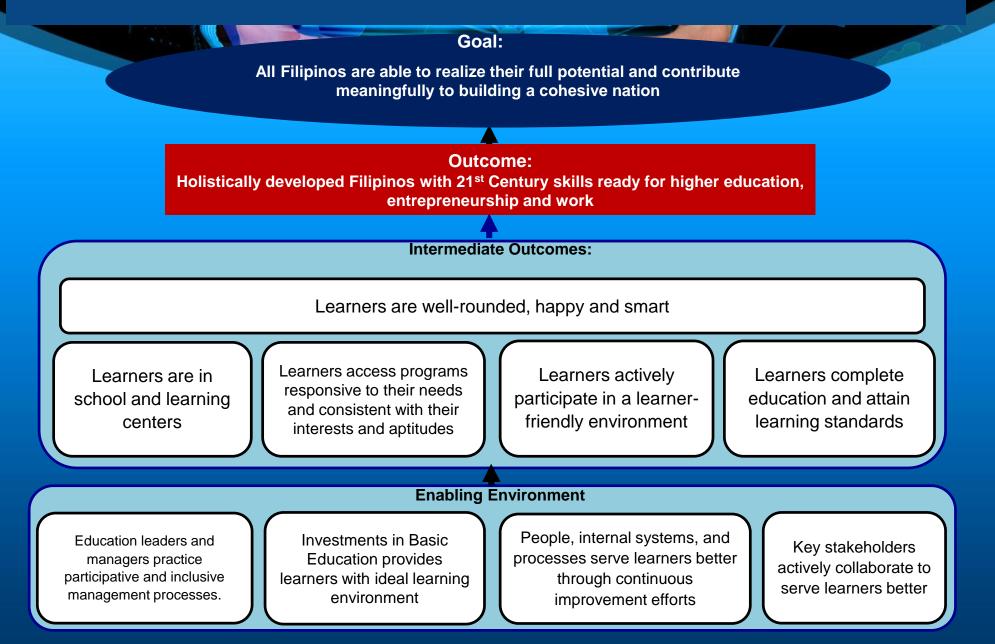| SKILLS | LEARNING AREAS |
|---|---|
| *Information, Media, and Technology Skills* | *Language* |
| *Learning and Innovation Skills* | *Technology and Livelihood Education (TLE)* |
| *Communication Skills* | *Mathematics and Science* |
| *Life and Career Skills* | *Arts and Humanities* |

## Curriculum Support System

| *Teachers* | *Teaching – Learning* | *Materials, Facilities,, Equipment, & ICT* | *Assessment* | *School Leadership and Management* | *Technical Assistance, Quality Assurance & Evaluation* | *Relevance, Community-Industry Partnerships* |
|---|---|---|---|---|---|---|

## Monitoring and Evaluation System

# PLANNING ENVIROMENT AND M&E FRAMEWORK

**Goal:**

All Filipinos are able to realize their full potential and contribute meaningfully to building a cohesive nation

**Outcome:**
Holistically developed Filipinos with 21st Century skills ready for higher education, entrepreneurship and work

**Intermediate Outcomes:**

Learners are well-rounded, happy and smart

| Learners are in school and learning centers | Learners access programs responsive to their needs and consistent with their interests and aptitudes | Learners actively participate in a learner-friendly environment | Learners complete education and attain learning standards |

**Enabling Environment**

| Education leaders and managers practice participative and inclusive management processes. | Investments in Basic Education provides learners with ideal learning environment | People, internal systems, and processes serve learners better through continuous improvement efforts | Key stakeholders actively collaborate to serve learners better |

Responds to the needs of "industry 4.0" or the fourth industrial revolution, where man and machine align to enable new possibilities

Harnesses the potential of digital technologies, Personalised data, open sourced content, and the new humanity of this globally-connected, technology-fueled world

Establishes a blueprint for the future of learning – lifelong learning – from childhood schooling, to continuous learning in the workplace, to learning to play a better role in society.

# Areas of Focus

**Curriculum**

**Teachers and teaching**

**Resources**

**Partnerships**

# Relevance, Rigor and Relearning:

- develop curriculum and delivery systems that are relevant to the regional, economic area and development, and aspirations of society
- From rote to rigor : right attitude, right skills, (problem solving, creating, innovating, Technical and vocational skills
- learner centric, collaborative,

Diverse time and place.

Personalized learning

Free choice.

Project based.

Field experience.

Exams will change completely.

Student ownership.

Mentoring will become more important.

Teach

Innovate

Compete

Collaborate

Inform
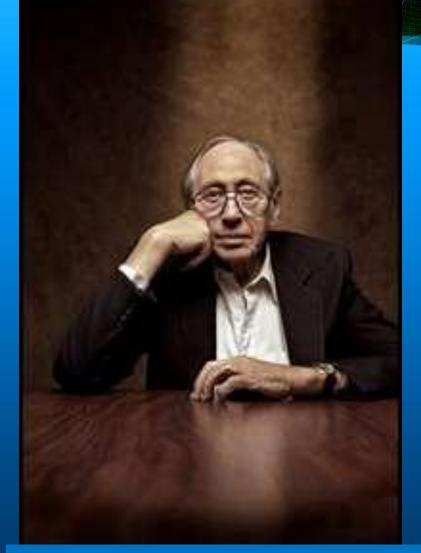
Transform

# Alvin Toffler

The illiterate of the 21st century will not be those who cannot read and write. The illiterate are those who cannot learn, relearn and unlearn.

Alvin Toffler
*The Third Wave*

# • References

• https://industry4magazine.com/the-beginners-guide-to-the-industry-4.0-f45b93a95649author: Corne Duivenvoorden
https://medium.com/@pdiwan/is-education-4-0-an-imperative-for-success-of-4th-industrial-revolution-50c31451e8a4

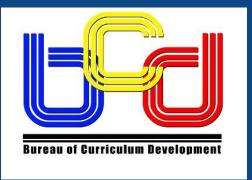https://www.ey.com/Publication/vwLUAssets/ey-leap-forgging/$File/ey-leap-forgging.pdf

https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/big-data-the-next-frontier-for-innovation

•Fisk, Peter. Changing the game of education. January 17, 2017.

*Isang karangalan*
*ang maglingkod sa bayan!*