ITU-ALECSO
Smart Learning Forum
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Future Trends in Technology..
Educational response

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Contents

- **Majors Transformations Led to Structural Changes in Labor Market :**

  - Continuing Disappearance and Creations of Jobs
  - New Skills Needed to Adapt to Significant Changes in Labor Market

- **Technology Megatrends: The Tipping Points**

- **Response of Educational Institutions**

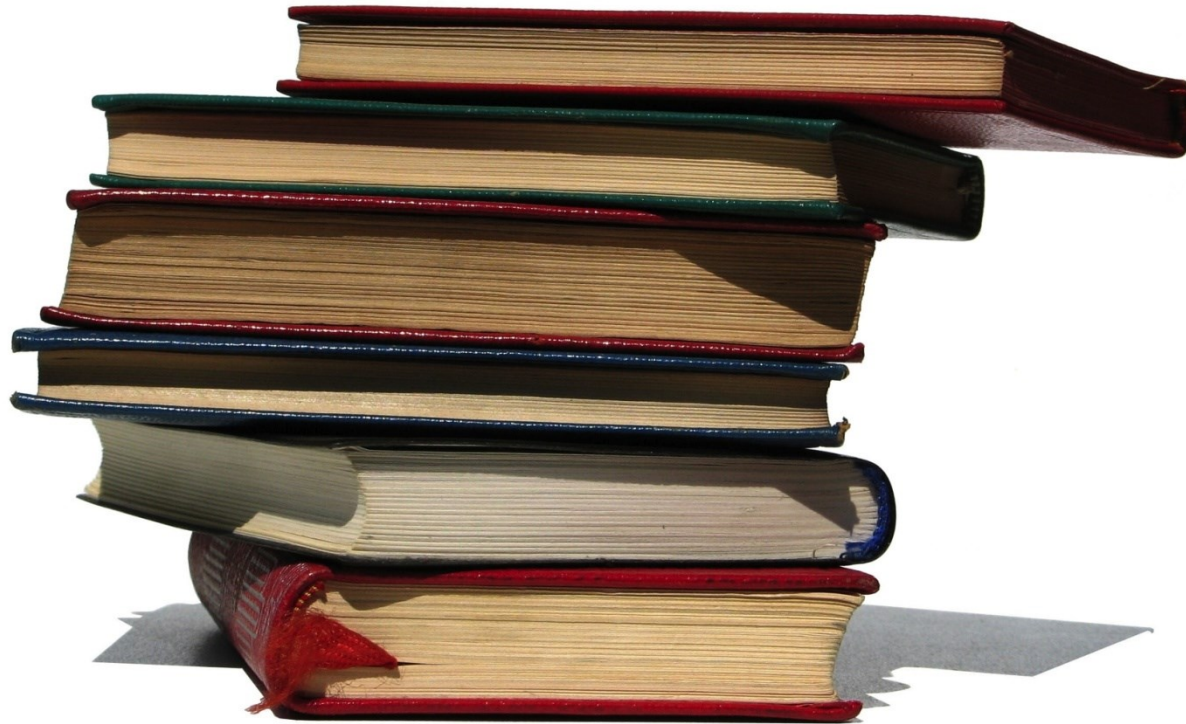- **HCT Version 2: An Integrated Plan that Ties with UAE's 2021**

USE OF MANUAL LABOUR

19th century

POWER OF KNOWLEDGE

$$\eta_i(t) \approx \sum_{j=1}^{m} \gamma_{ij}(t)\xi_j(t) + \sum_{j,k=1}^{m} \beta_{ijk}(t; t-\lambda)\xi_j(t)\xi_k(t-\lambda) + \sum_{j=1}^{m} \int_{t-\lambda}^{t} \gamma'_{ij}(\tau)\xi_j(\tau)d\tau +$$

$$+ \sum_{j,k=1}^{m} \xi_k(t-\lambda) \int_{t-\lambda}^{t} \frac{\partial \beta_{ijk}(\tau; t-\lambda)}{\partial \tau}\xi_j(\tau)d\tau + \sum_{j,k=1}^{m} \xi_j(t) \int_{t-\mu}^{t-\lambda} \frac{\partial \beta_{ijk}(t; \theta)}{\partial \theta}\xi_k(\theta)d\theta +$$

$$+ \sum_{j,k=1}^{m} \int_{t-\lambda}^{t} d\tau \int_{t-\mu}^{t-\lambda} \frac{\partial^2 \beta_{ijk}(\tau; \theta)}{\partial \theta \partial \tau}\xi_j(\tau)\xi_k(\theta)d\theta \quad , i = 1, 2, ..., n. \qquad (2.23)$$

20th century

The Future!

21st Century smart work

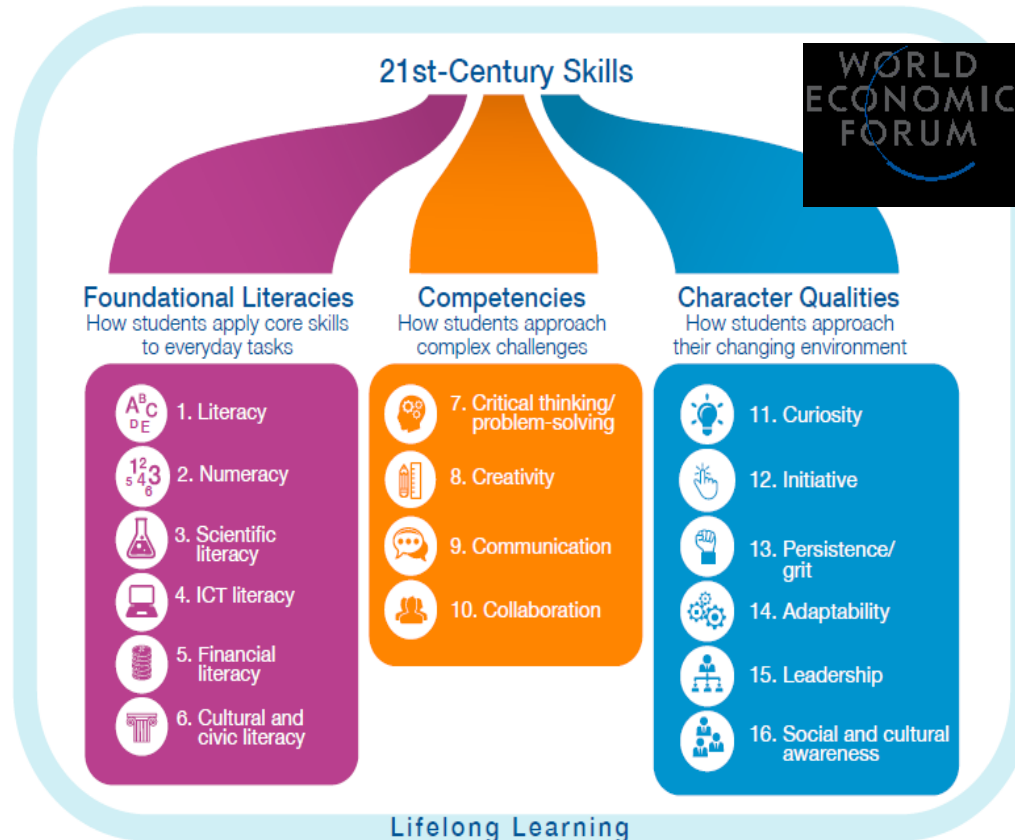Rapid, global digital transformation across **all** industries

Jobs That Does Not Yet Exist!

- Technological advances are rapidly automating many activities that currently require human work.

- A 2013 Oxford Martin School study estimated that 47% of US jobs could be replaced by automated processes within two decades.

- While always removing the need for some types of jobs, technology creates new ones and new tools for increasing the efficiency of labor inputs.

- Yes, the Industrial Revolution destroyed some jobs but created many more.

- The picture looks worse than it actually is. Nine of the 10 most in-demand jobs in 2012 did not exist in 2003!

New set of skills in order to adapt to these changes

A recent WEF report indicates students require 16 skills for the 21st Century

'Competencies' and 'character qualities' are essential future skills

21st-Century Skills

WORLD ECONOMIC FORUM

Foundational Literacies
How students apply core skills to everyday tasks

1. Literacy
2. Numeracy
3. Scientific literacy
4. ICT literacy
5. Financial literacy
6. Cultural and civic literacy

Competencies
How students approach complex challenges

7. Critical thinking/ problem-solving
8. Creativity
9. Communication
10. Collaboration

Character Qualities
How students approach their changing environment

11. Curiosity
12. Initiative
13. Persistence/ grit
14. Adaptability
15. Leadership
16. Social and cultural awareness

Lifelong Learning

Competencies: ability to critically evaluate and convey knowledge, as well as work well with a team

Critical thinking: ability to identify, analyze and evaluate situations, ideas and information in order to formulate responses to problems

Character qualities: ability to tackle a changing environment

Persistence/grit: Ability to sustain interest and effort and to persevere to accomplish a task or goal

1. Programme for the International Assessment of Adult Competencies (PIAAC)
Source: UNEVCO report 2013; Deep Shift Technology Tipping Points and Societal Impact , WEF 2015;
New Vision for Education Unlocking the Potential of Technology, WEF 2015;

Technology Tipping Points and Societal Impact

Global Agenda Council on the Future of Software & Society

Deep Shift
Technology Tipping Points and Societal Impact

Survey Report, September 2015

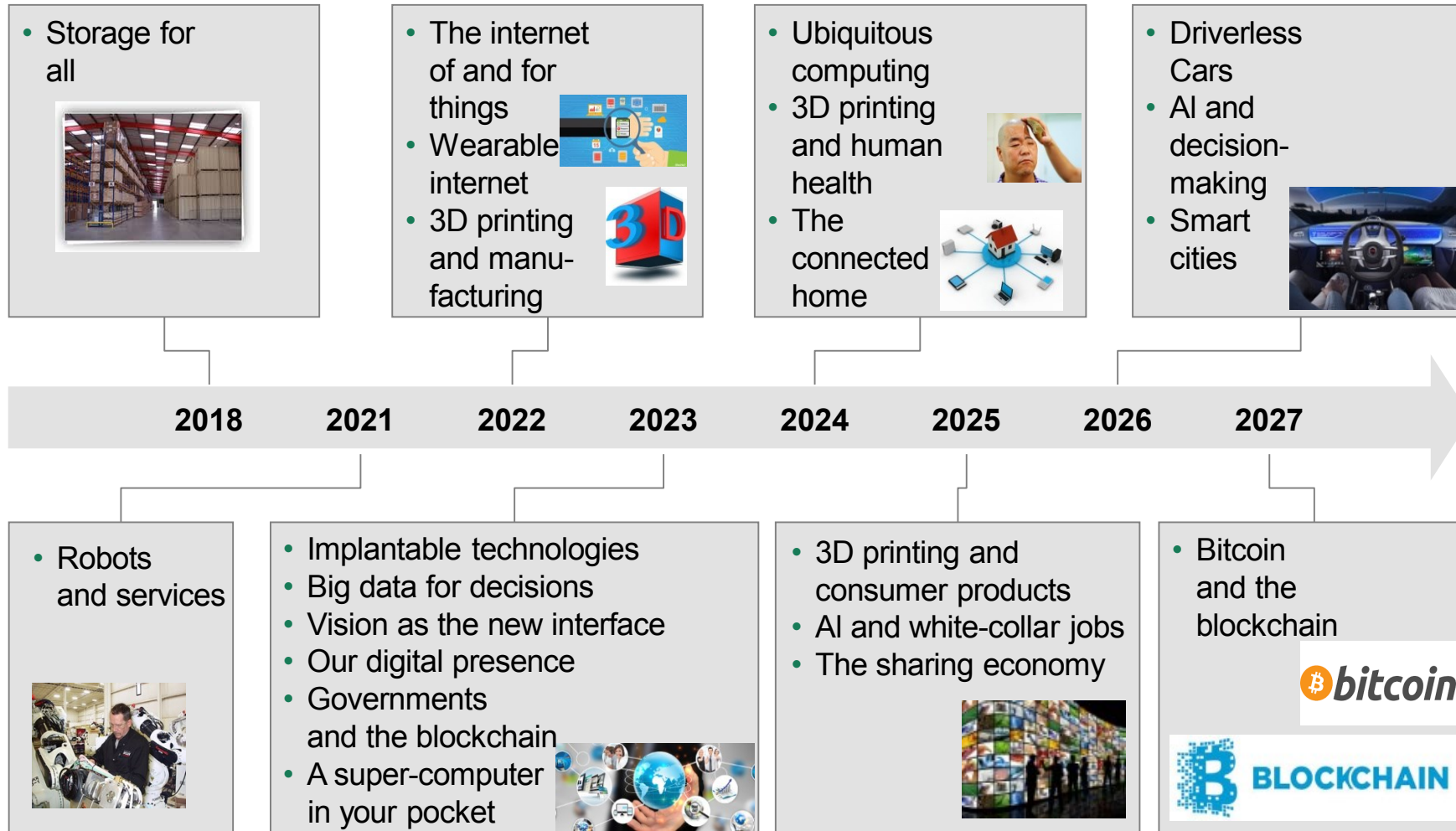**Survey Report, September 2015**

The Survey

- A snapshot of expectations from a community of over 800 executives and experts from the information and communications technology sector.

- The survey asked respondents for their perception of when these tipping points would occur, offering date ranges from "it has already happened" to "20+ years".

Six technology megatrends underway... 'tipping point'

People and the internet		**1**	Wearable and implantable technologies will enhance people's "digital presence"
Computing, communications and storage		**2**	Everyone has access to a supercomputer in their pocket, with nearly unlimited storage capacity
The Internet of Things		**3**	Smaller, cheaper and smarter sensors are being introduced—in homes, clothes and accessories, cities, transport and energy networks etc…..
Artificial Intelligence (AI) and big data		**4**	Rise of big data for decision-making, and the influence that AI and robotics are starting to have on decision-making and jobs
The sharing economy and distributed trust		**5**	The internet is driving a shift towards networks and platform-based social and economic
The digitalization of matter		**6**	Physical objects are "printed" from raw materials via additive, or 3D, printing

...with technology disruptions causing 'tipping points'

WORLD ECONOMIC FORUM

- Storage for all

- The internet of and for things
- Wearable internet
- 3D printing and manu-facturing

- Ubiquitous computing
- 3D printing and human health
- The connected home

- Driverless Cars
- AI and decision-making
- Smart cities

2018   2021   2022   2023   2024   2025   2026   2027

- Robots and services

- Implantable technologies
- Big data for decisions
- Vision as the new interface
- Our digital presence
- Governments and the blockchain
- A super-computer in your pocket

- 3D printing and consumer products
- AI and white-collar jobs
- The sharing economy

- Bitcoin and the blockchain

bitcoin

BLOCKCHAIN

Educational institutions are preparing themselves and their students for technology innovation

How is this being done?

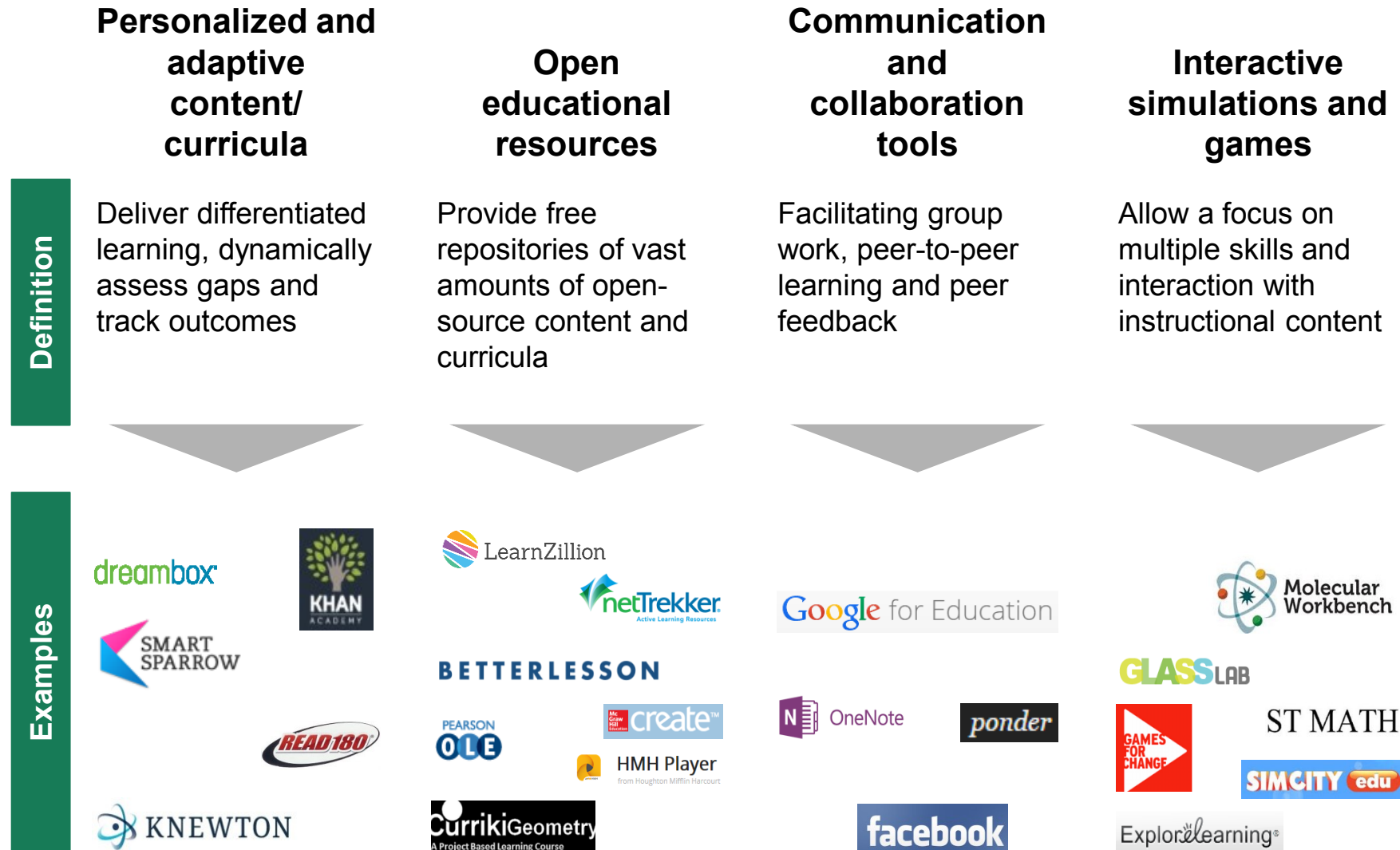|	
Fostering student interest in technology innovation	• Conferences, workshops, competitions and curricula designed to engage students on exciting technology innovation across a variety of fields
Immersing students in technology innovation	• Encourage the use of innovative tech tools for classroom activities and collaborative work among students
Leverage technology innovation to drive productivity	• Streamline academic processes (i.e. computer-based examinations, online courses and meetings) • Reduce material costs (i.e. e-books)

Educators and Tech providers are innovating methods

Definition	**Personalized and adaptive content/ curricula**	**Open educational resources**	**Communication and collaboration tools**	**Interactive simulations and games**
	Deliver differentiated learning, dynamically assess gaps and track outcomes	Provide free repositories of vast amounts of open-source content and curricula	Facilitating group work, peer-to-peer learning and peer feedback	Allow a focus on multiple skills and interaction with instructional content

Examples

Institutional tools help develop teachers

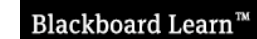**Digital professional development resources for teachers**

Student information and learning management systems

Definition

Add more instructional strategies to a teacher's repertoire and improve their ability to execute on these strategies through online resources and support

Generate data on student performance and facilitate the development of 21st century skills through enabling greater student collaboration and communication
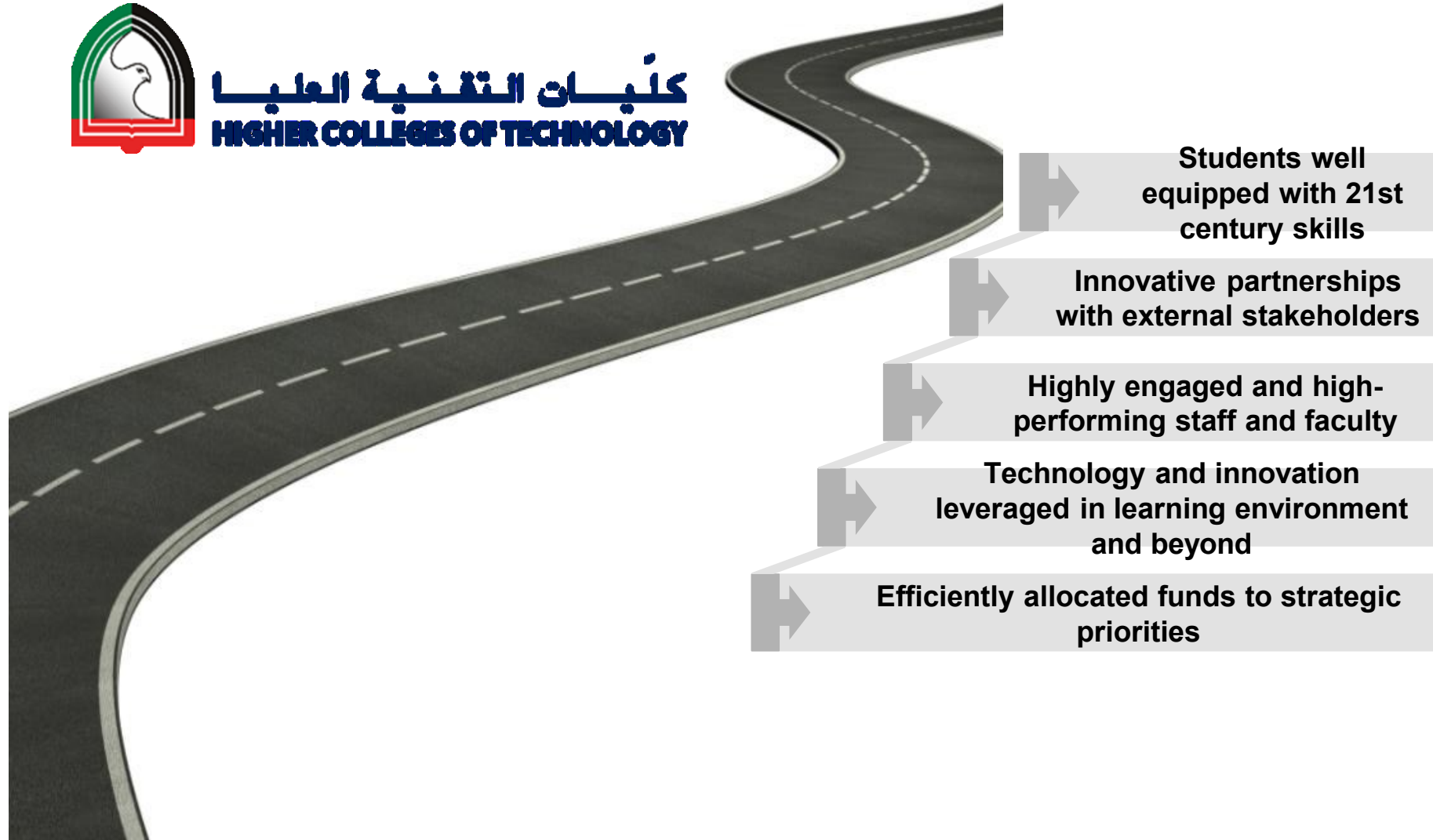
Examples

HCT Version 2.0
to become a role model for UAE's Vision 2021

UAE's Vision 2021 with focus on first-rate education system …

… and emphasis on **5 key elements** in the new strategic model

United in Responsibility

United in Destiny

United in Knowledge

United in Prosperity

COHESIVE SOCIETY AND PRESERVED IDENTITY

SAFE PUBLIC AND FAIR JUDICIARY

COMPETITIVE KNOWLEDGE ECONOMY

FIRST-RATE EDUCATION SYSTEM

WORLD-CLASS HEALTHCARE

SUSTAINABLE ENVIRONMENT AND INFRASTRUCTURE

7-star services
- Bring government service on part with private sector

Government innovation
- Adopt a culture of innovation and make it a part of working routine

Prepare for the future
- Utilize analytics to predict future trends and challenges

Focus on Results
- Maximize benefits and focus on activities that lead to concrete results

Financial Efficiency
- Optimize resources to ensure best value for money

H H Sheikh Mohamed Bin Zayed

FRIENDS, Let's RETHINK Learning, SERIOUSLY!