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MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN

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Digital Competencies for Industry 4.0 Vietnamese case: issues and challenges

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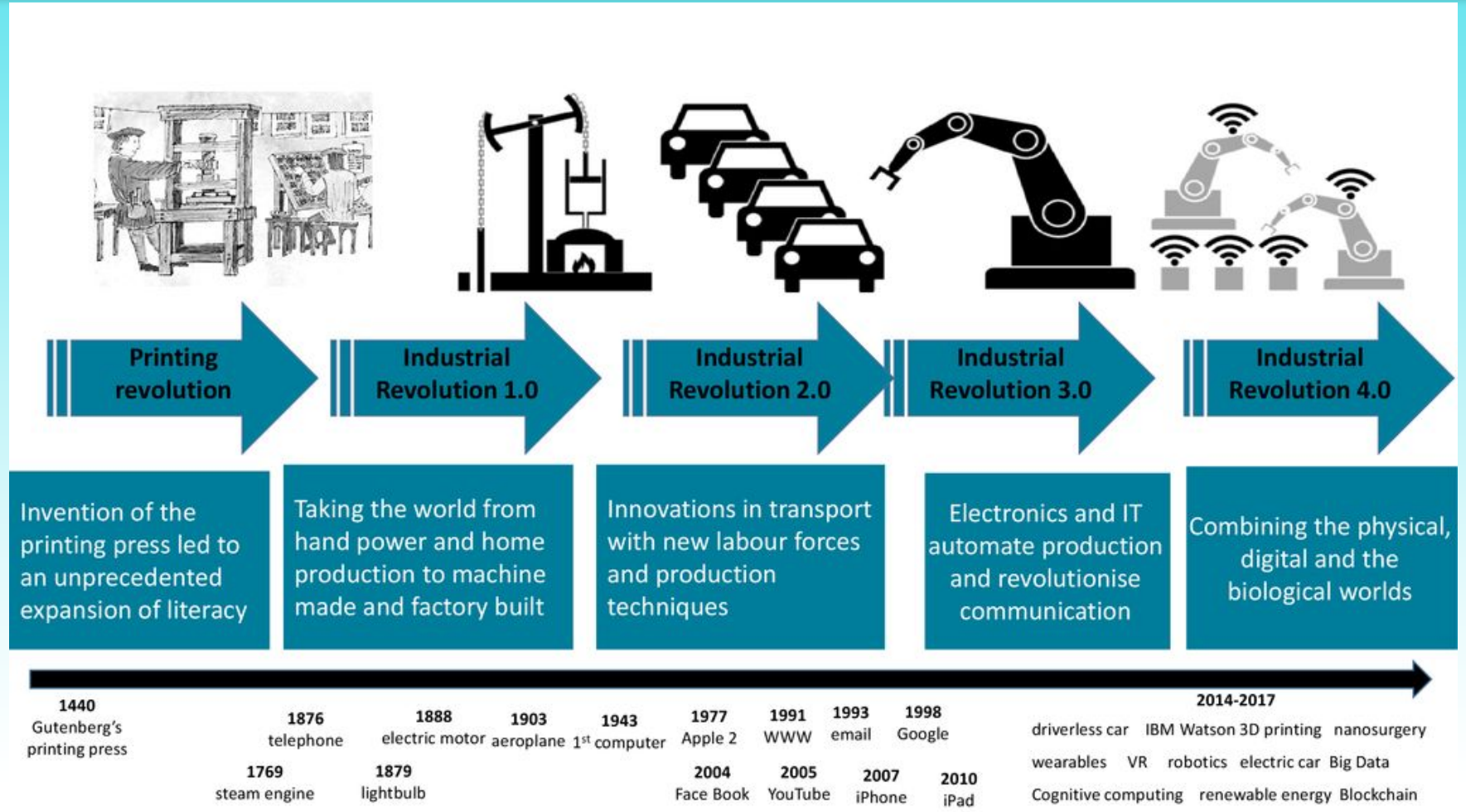
Plan

- Introduction
- Issues
- Challenges
- New teacher education approach
- Competency approach in the new general curriculum
- Student digital competencies

IR. 4.0 timeframe



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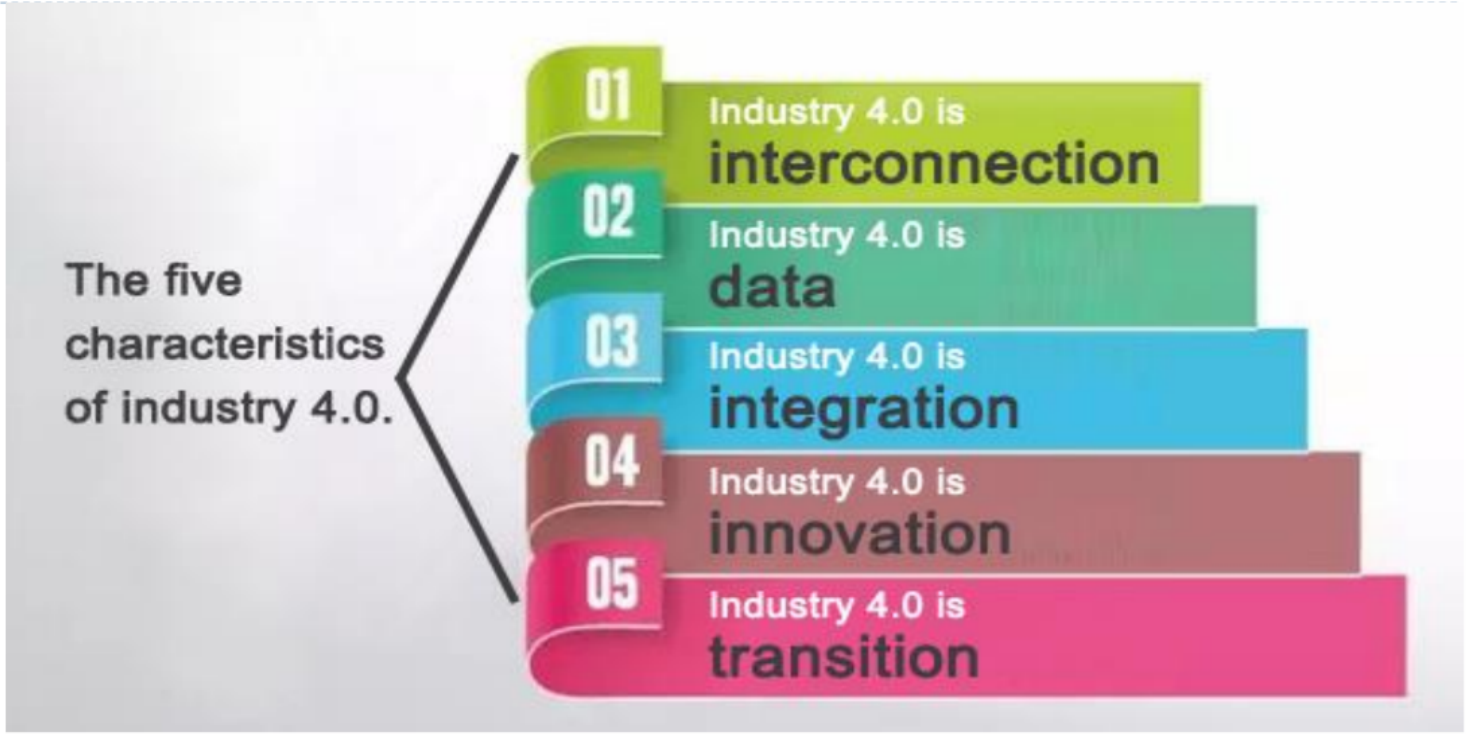
Principles of Industry 4.0



The key essence of Industry 4.0 Concept is **the enhancement of efficiency in the process of industry by way the utilization of connectivity and ICT (Information & Communication Technology).**

Society 5.0 or Smart society

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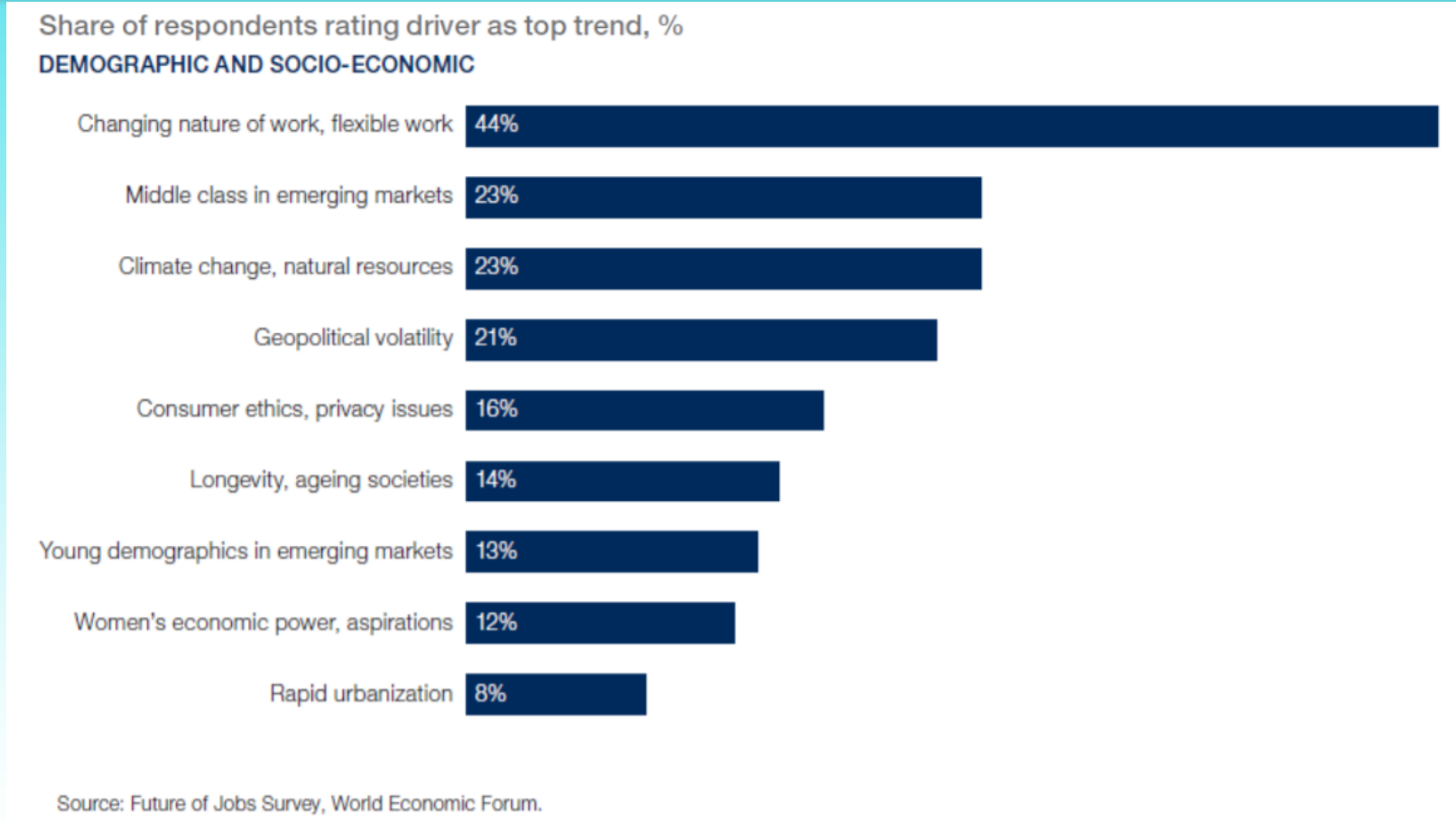
The future of Jobs



The future of Jobs Skills Requirement

Abilities

Cognitive Abilities
- Cognitive Flexibility
- Creativity
- Logical Reasoning
- Problem Sensitivity
- Mathematical Reasoning
- Visualization

Physical Abilities
- Physical Strength
- Manual Dexterity and Precision

Basic Skills

Content Skills
- Active Learning
- Oral Expression
- Reading Comprehension
- Written Expression
- ICT Literacy

Process Skills
- Active Listening
- Critical Thinking
- Monitoring Self and Others

Cross-functional Skills

Social Skills
- Coordinating with Others
- Emotional Intelligence
- Negotiation
- Persuasion
- Service Orientation
- Training and Teaching Others

Systems Skills
- Judgement and Decision-making
- Systems Analysis

Complex Problem Solving Skills
- Complex Problem Solving

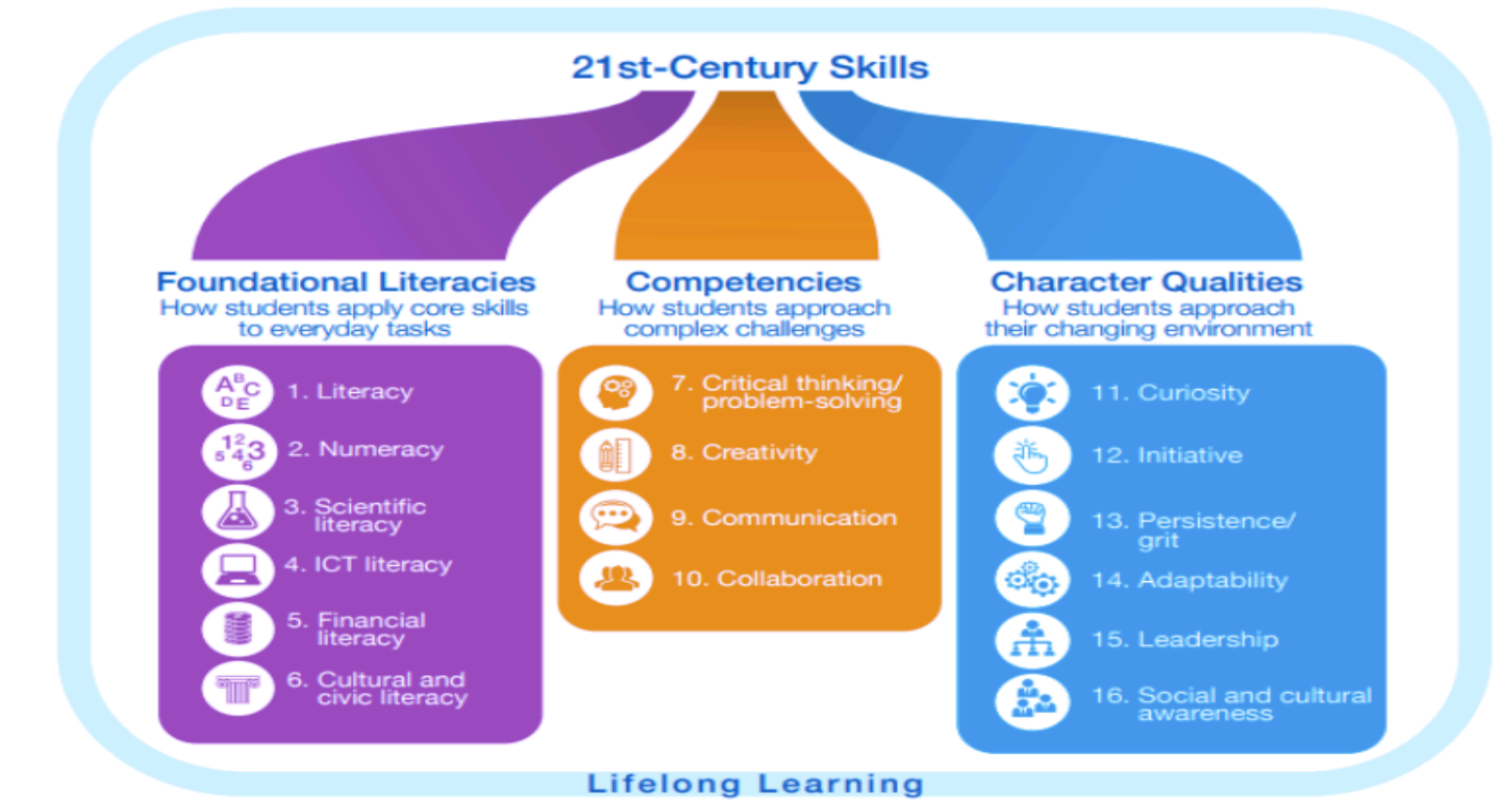
Resource Management Skills
- Management of Financial Resources
- Management of Material Resources
- People Management
- Time Management

Technical Skills
- Equipment Maintenance and Repair
- Equipment Operation and Control
- Programming
- Quality Control
- Technology and User Experience Design
- Troubleshooting

Source: World Economic Forum, based on O*NET Content Model.

Nowadays student

Student competencies



Note: ICT stands for information and communications technology.

New vision for Education

The New Vision for Education project examines the role that technology can potentially play to improve education for the future. In phase II, we investigated innovative ways to help students develop competencies* and character qualities** broadly defined as social emotional skills, which are critical components of 21st century skill framework but not a core focus in today's curriculum.

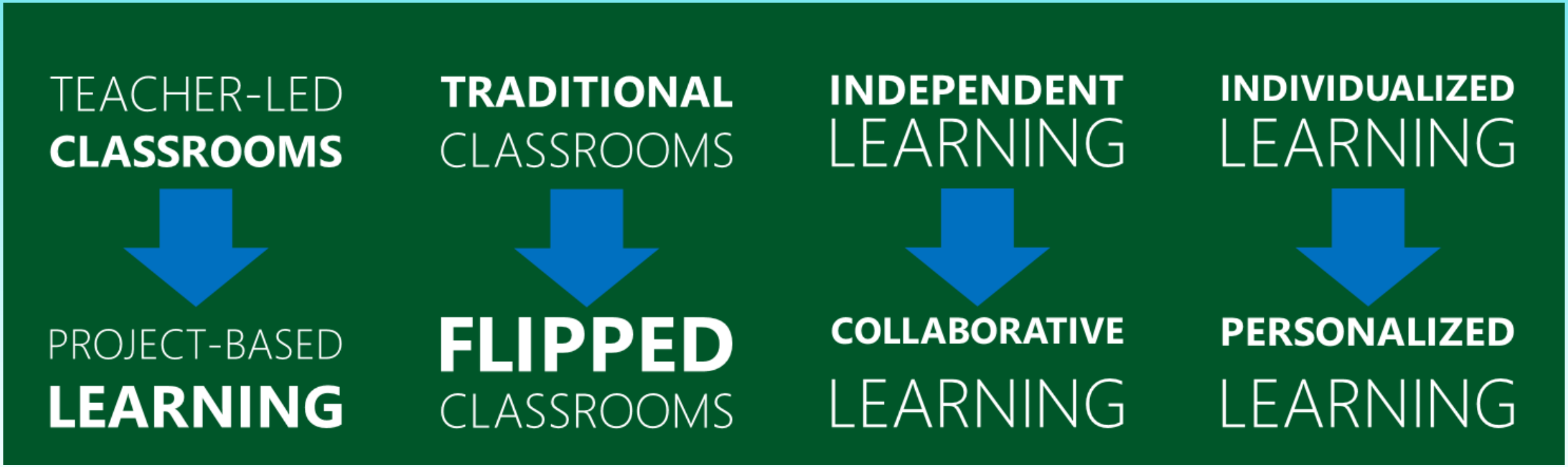
SMART Education for Society 5.0

- The revolution is not about introducing more tech into schools. It's about creating access and scalable models to transform Education towards a ubiquitous system .
- Smart Education" Approach should be simplified for teachers, parents and education managers; integrative for community collaborations.
- In the current 4.0 Revolution, Smart Education is constantly happening outside of the School Systems. So how do we maximize opportunities?
    - Lower Costs to Sustain Smart Education
    - Leveraging Resources to Co-Create Qualified Instructions
    - **REMOVE COMPETITIVENESS and INSPIRE BENEFICIAL COLLABORATIONS** for sustainable and regenerative development.

Long-term strategies for Education in Vietnam

- Reform of Education system: curriculum
  Teacher Education
- Enhance life-long learning
- Cross-industry and public-private collaboration
- Core national standard on teacher and student competencies

Pedagogy in IR. 4.0



Characteristics of the Vietnam new curriculum (from 2020-2021 academic year)

To develop student's competencies and values

5 core values

1) Patriotism

2) Compassion

3) Hard work

5) Responsibilities

4) Honesty

Characteristics of the Vietnam new curriculum (from 2020-2021 academic year)

To develop student's competencies and values

10 core competencies		Special competencies (for gifted students)
Common competencies	Specifics competencies	
1) Self autonomous 2) Collaboration and communication 3) Problem solving and creativities	1) Language 2) Computation 3) Understanding on Nature and Society 4) Technology 5) Informatic 6) Esthetic 7) Health	

Competency based curriculum

To develop student's competencies and values

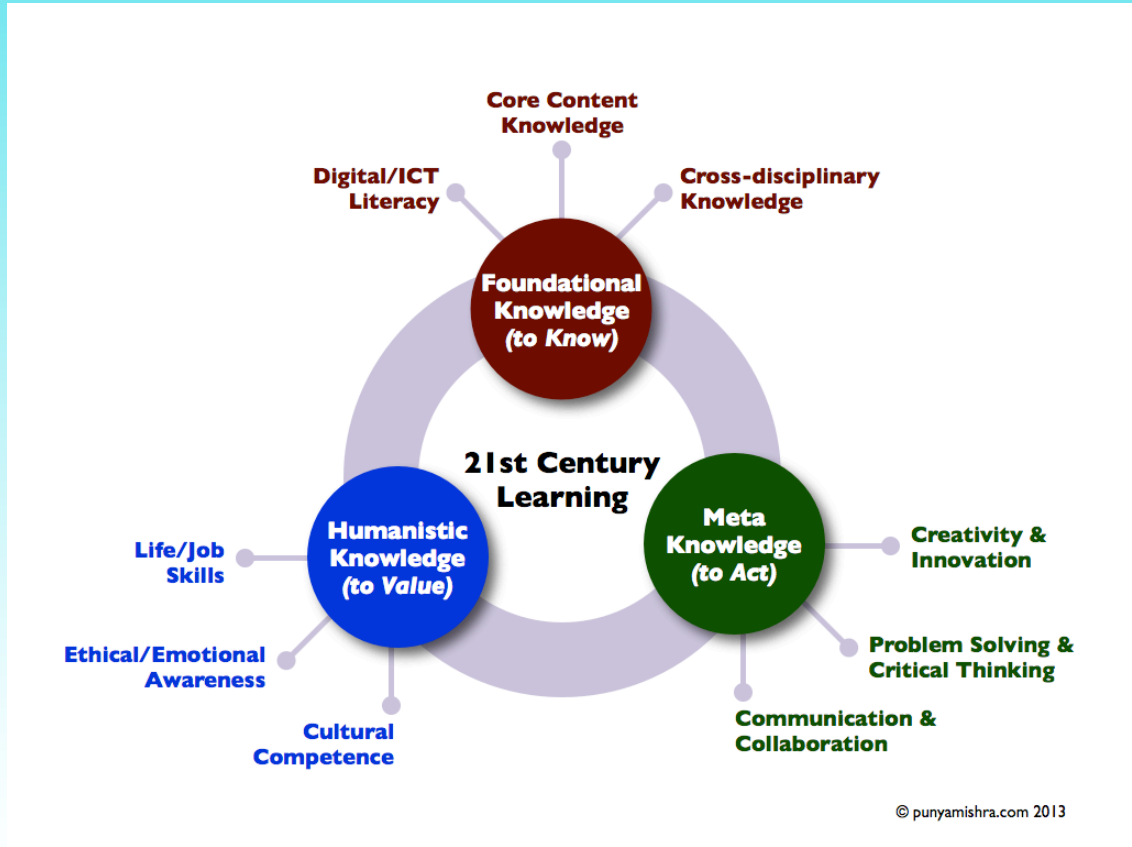
A
- Differentiated learning

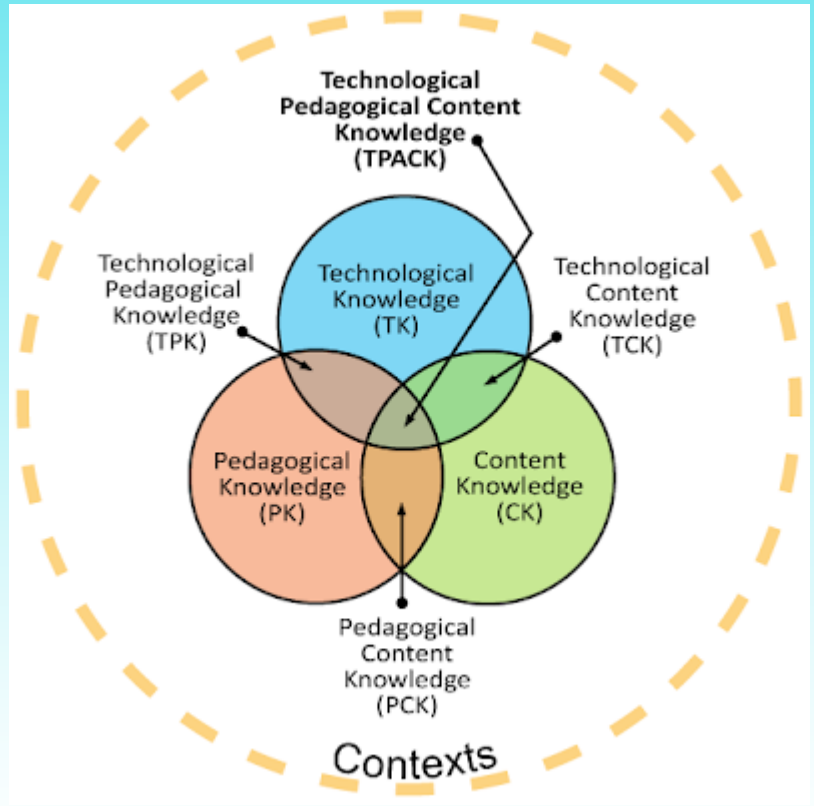
B
- Integrated teaching

C
- Teaching by activities

Technologies in Education

TPK model in Vietnam teacher education institution





Student digital competencies in new curriculum

Questions	Explaination
1. What are the changes in the curriculum objectives?	***1. General objectives of the all 3 educational levels*** - Contribute to the formation and development of all five core qualities, three general competences, and seve professional competences, in particular the informatics competence identified in the General Curriculum. - Assists in the formation and development of all students in informatics competence including **5 groups** **competency components:** – *Competence a: Use and management of tools, means, automation systems of IT and ICT.* – *Competence b: Knowledge and behavior in accordance with ethical, cultural and legal standards in th information society and knowledge economy.* – *Competence c: Detect and solve problems with the support of digital technology.* – *Competence d: Learning, self-learning with the support of IT and ICT systems.* – *Competence e: Communication, integration, cooperation in accordance with the era of knowledg economy.* Informatic Subject equips students with a common computer knowledge system consisting of three integrate strands: - Computer Science (CS) - Information and Communication Technology (ICT) - Digital Literacy (DL)

Student digital competencies in new curriculum

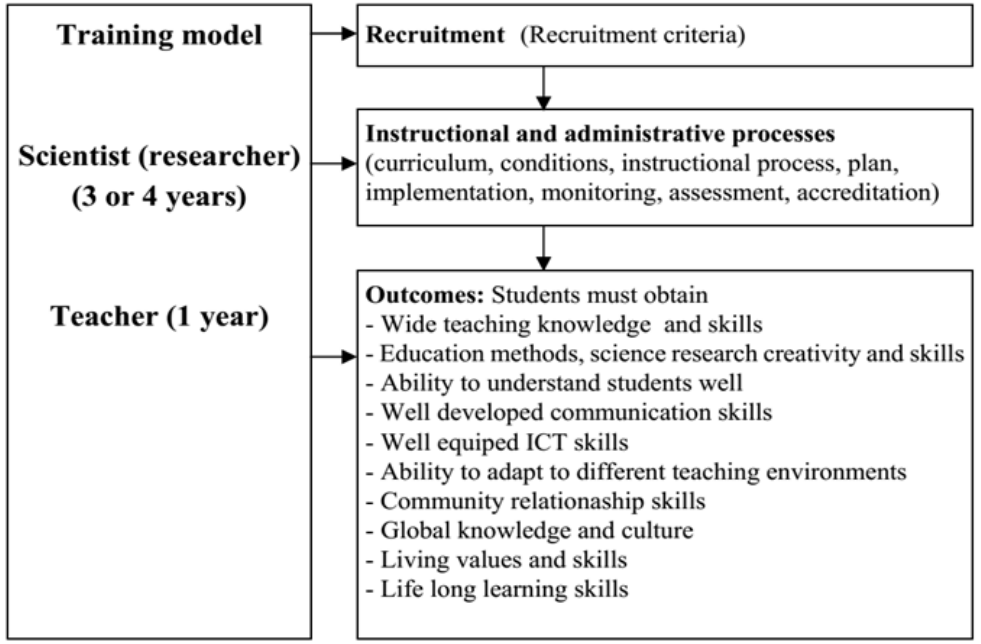
Primary education level	LSE level	USE level
Topic C. Store, search and exchange information • Arrange to make it easy to find • Search for information in problem solving Topic F. Problem solving with the help of a computer. • Do the work according to the steps • Your tasks and computer help • Get familiar with the visual programming environment • Play and explore in an visual programming environment	Topic C. Store, search and exchange information • Social networking and some popular information exchange channels on the Internet • Characteristics of information in the digital environment • Information with problem solving • Evaluate the quality of information in problem solving Topic D. Ethics, law and culture in digital environments • Preventing some harm	Topic A. Computer and knowledge society • Introduction to Artificial Intelligence • Digital devices world • ICT Practice connecting digital devices Topic B. Computer Network and Internet • Network connections • (CS) Get familiar with computer network design Topic D. Ethics, law and culture in digital environments • Obligation of legal compliance in the digital environment • Cultural behavior and online safety

Student digital competencies in new curriculum

	Topic D. Ethics, law and culture in digital environments • Use appropriate personal information in the digital environment • Software copyright • Information Copyright	when joining the Internet • Cultural behavior through digital media • Ethics and culture in the use of digital technology • Some legal issues about using Internet services Topic E. Applied computing • Mind map and thinking diagram software Topic F. Problem solving with the help of a computer • Visual programming Topic G. Career with Informatics • Informatics and occupations • Informatics and career orientation	• Keep humanity in the virtual world Topic E. Applied computing • (ICT) Graphic Design Software • (ICT) Photo and video editing software • (ICT) Practice creating simple website Topic F. Problem solving with the help of a computer • Create a website • (CS) Introduction to Machine Learning and Data Science • (CS) Simulation in problem solving Topic G. Career with Informatics • Introduce job categories of design and programming • Introduction job categories of data management and processing • Introduce job categories of service and management • Introduce the occupations of applied computing and the fields of information technology

Teacher education curriculum in UEd-VNU

Teacher education in	M1	M2	M3		M4		M5		M6	Total credits
			Compulsory	Electives	Compulsory	Electives	Compulsory	Electives		
Mathematics	29	6	12	6	43	0	20	10	10	136
Physics	28	6	12	6	30	6	22	15	10	135
Chemistry	28	6	12	6	52	5	6	12	10	137
Biology	28	6	12	6	31	6	28	9	10	136
Literature	27	6	12	6	15	12	40	7	10	135
History	27	6	12	6	34	10	14	16	10	135



Thanks for your attention

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