Competencies for Collaborative Online Teaching

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Agenda for Today

- Part I: Theoretical framework for collaborative online teaching and learning
- Part II: Teachers' pedagogical and technological competencies for collaborative online teaching
- Part III: Few Tools for collaborative online teaching

Theoretical Framework for Collaborative Online Teaching and Learning

- In the past, distance education/online learning was looked upon as an elective way of teaching and learning but now it becomes mandatory
- Major and ancient problems of distance education / online learning
  - Low student motivation
  - Low student engagement
  - Low retention
  - High drop out rates

Theoretical Framework for Collaborative Online Teaching and Learning

- Engaging students with learning activities is a challenge
- The 7 principles for good practice in undergrad education (Chickering and Gamson, 1987)
  - Encourage contact between students and faculty.
  - Develop reciprocity and cooperation among students.
  - Encourage active learning.
  - Give prompt feedback.
  - Emphasize time on task.
  - Communicate high expectations.
  - Respect diverse talents and ways of learning
- Seven principles of effective teaching: A practical lens for evaluating online courses (Graham, C., Cagiltay, K., Lim, B. R., Craner, J., & Duffy, T. M. (2001).
- Indiana University's National Survey of Student Engagement (NSSE)

Theoretical Framework for Collaborative Online Teaching and Learning

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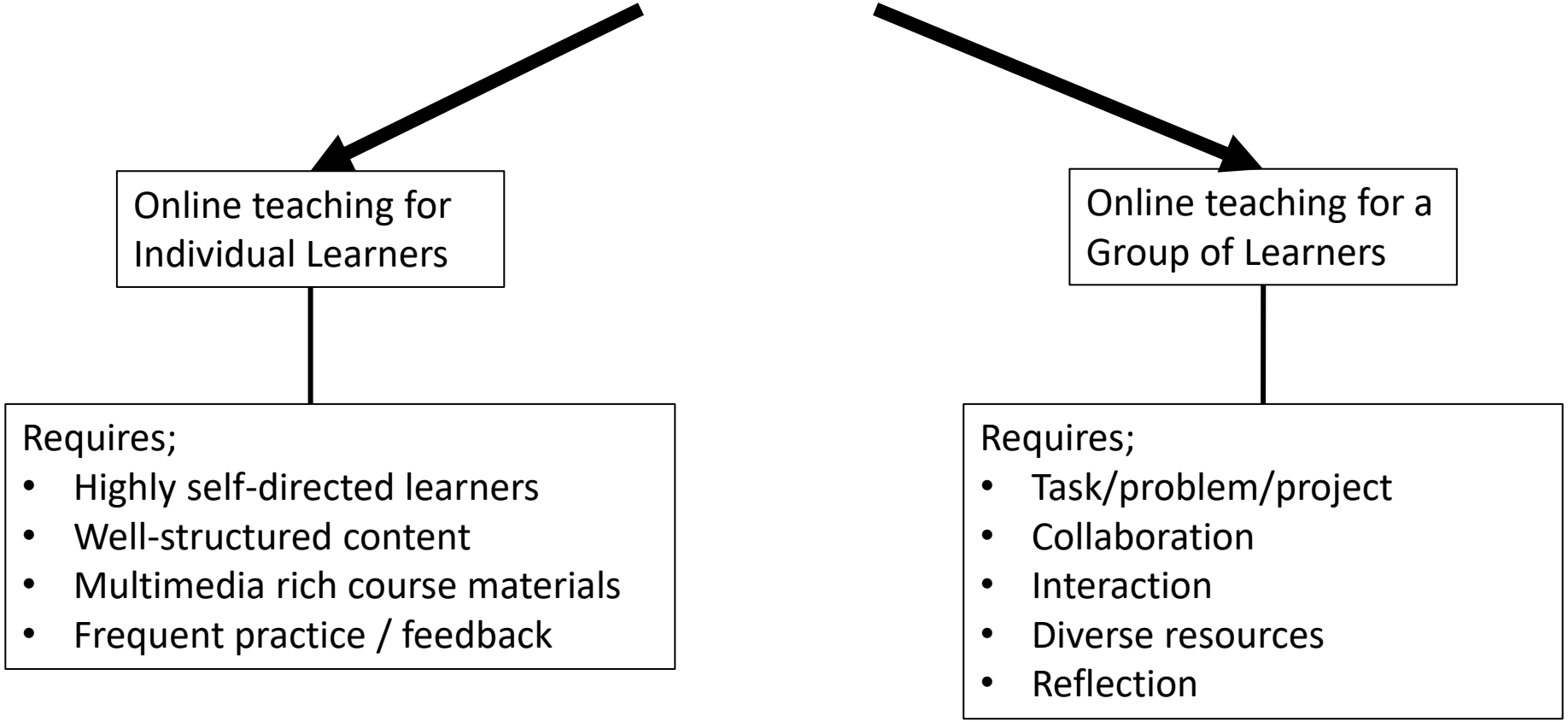

Theoretical Framework for Collaborative Online Teaching and Learning

- Cooperative vs. Collaborative
- Cooperative = Divide and conquer
- Collaborative = Deciding together via discussion and persuasion

Theoretical Framework for Collaborative Online Teaching and Learning

- Constructivism as a learning theory
  - Experiences (dealing with reality) build a schema (truth)
  - Conflict between truth and reality ignites learning process
  - Learning through experience
- Vygotsky's social constructivism
  - Truth is constructed within the community
  - Reaching «consensus» creates truth
  - Discussion and persuasion are important elements of reaching consensus

Theoretical Framework for Collaborative Online Teaching and Learning

- The heart of instructional approach is the problem solving process
  - Having an ill-structured problem
  - Define the problem and success factors
  - Determine possible solutions, ramifications, and implications
  - Pick the best solution and implement it
  - Collect and analyze data
  - Evaluate the solution and reflect on the process and the product
- It may be called problem based learning, collaborative problem solving process, 5E model, 7E model, computational thinking etc.

Theoretical Framework for Collaborative Online Teaching and Learning

- Using Social Constructivism in Teaching (F2F or Online)
  - Jonassen's (1999) Constructivist Learning Environment Model
    - Problem/task
    - Related Cases
    - Information resources
    - Cognitive tools
    - Communication / Discussion tools
    - Social / Contextual support
  - Garrison, Anderson and Archer's (2000) Community of Inquiry Model
    - Cognitive presence
    - Social presence
    - Teaching presence

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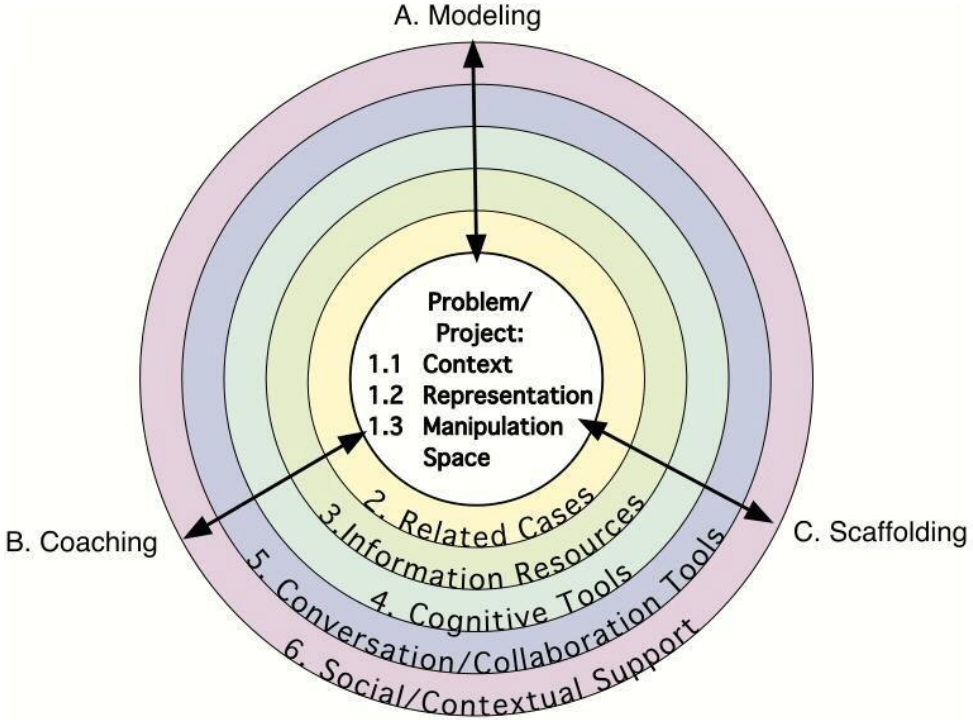

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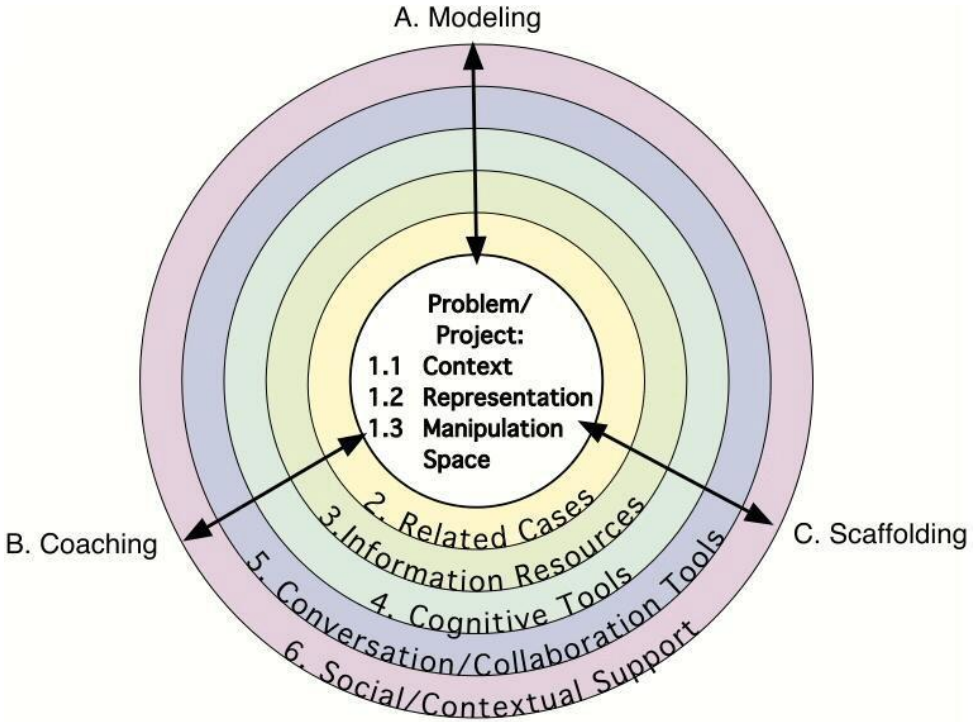
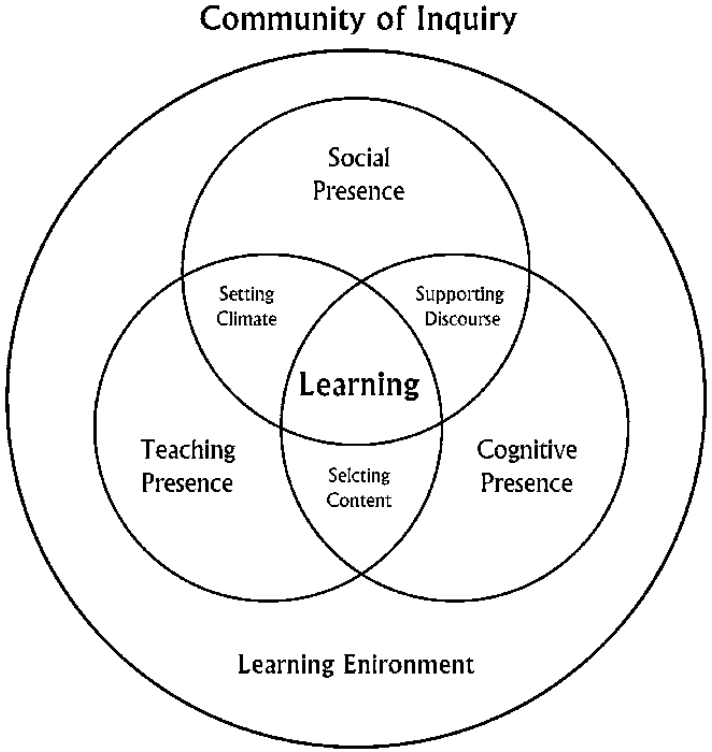




Part 2: Teachers' Pedagogical And Technological Competencies For Collaborative Online Teaching

Teachers' Pedagogical And Technological Competencies For Collaborative Online Teaching

- Unlike traditional distance education, Online learning means to merge pedagogy and advanced technology
- Collaborative online learning means to merge advanced pedagogy and advanced technology
- The goal is to create a learning environment with rich information and communication tools
- Therefore, pedagogical and technological competencies are important

What is Competency?

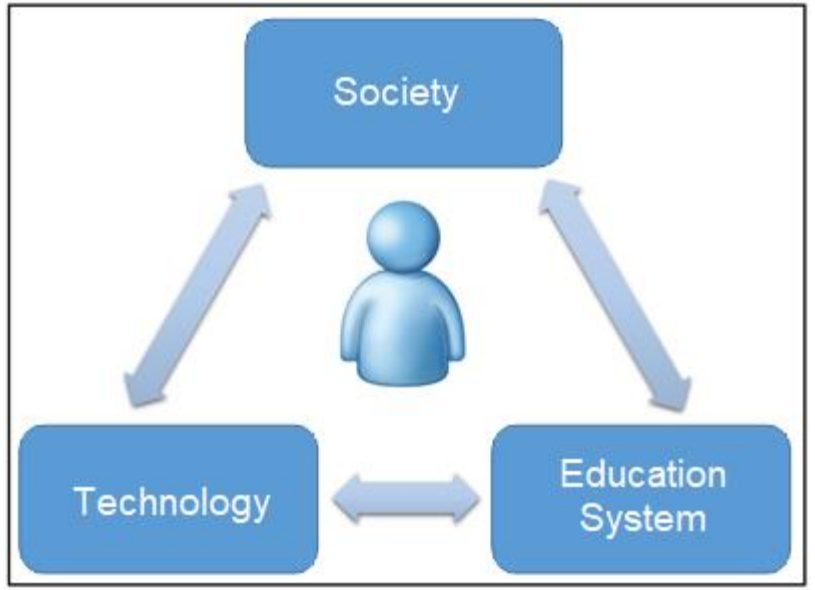
- Definition of competency
  - Specialized knowledge and skills to do a task adequately
  - Collection of knowledge and skills required to do a task within certain standards

Why Competencies are Important?

- Help to define types and levels of knowledge and skills
- Help to develop curriculum
- Help to create course contents
- Help to train pre-service teachers
- Help to develop teacher Professional development programs
- In summary, help to answer what to teach and what to learn questions

Where do Competencies Come from?

- Technology, Society, Education systems and Learners are all in interaction
- Toeffler's 3 age: Agricultural age, Industrial age, Information age
- Industrial revolutions
  - First -> Steam engine
  - Second -> Internal combustion engine and electricity
  - Third -> Production and productivity with information systems
  - Fourth -> Autonomous systems



Foundational Values for Competencies

- 21st Century Competencies
  - Problem solving
  - Teamwork
  - Technology literacy
  - Information literacy
  - Lifelong learning
  - Leadership
  - Innovation
  - …… (list goes on)
- 21st century competencies are mentioned for the first time in Fryer's 1997 lifelong learning policy report.

- Five Minds for the Future (Gardner, 2006)
  1. The Disciplined Mind
  2. The Synthesizing Mind
  3. The Creating Mind
  4. The Respectful Mind
  5. The Ethical Mind

Foundational Values for Competencies

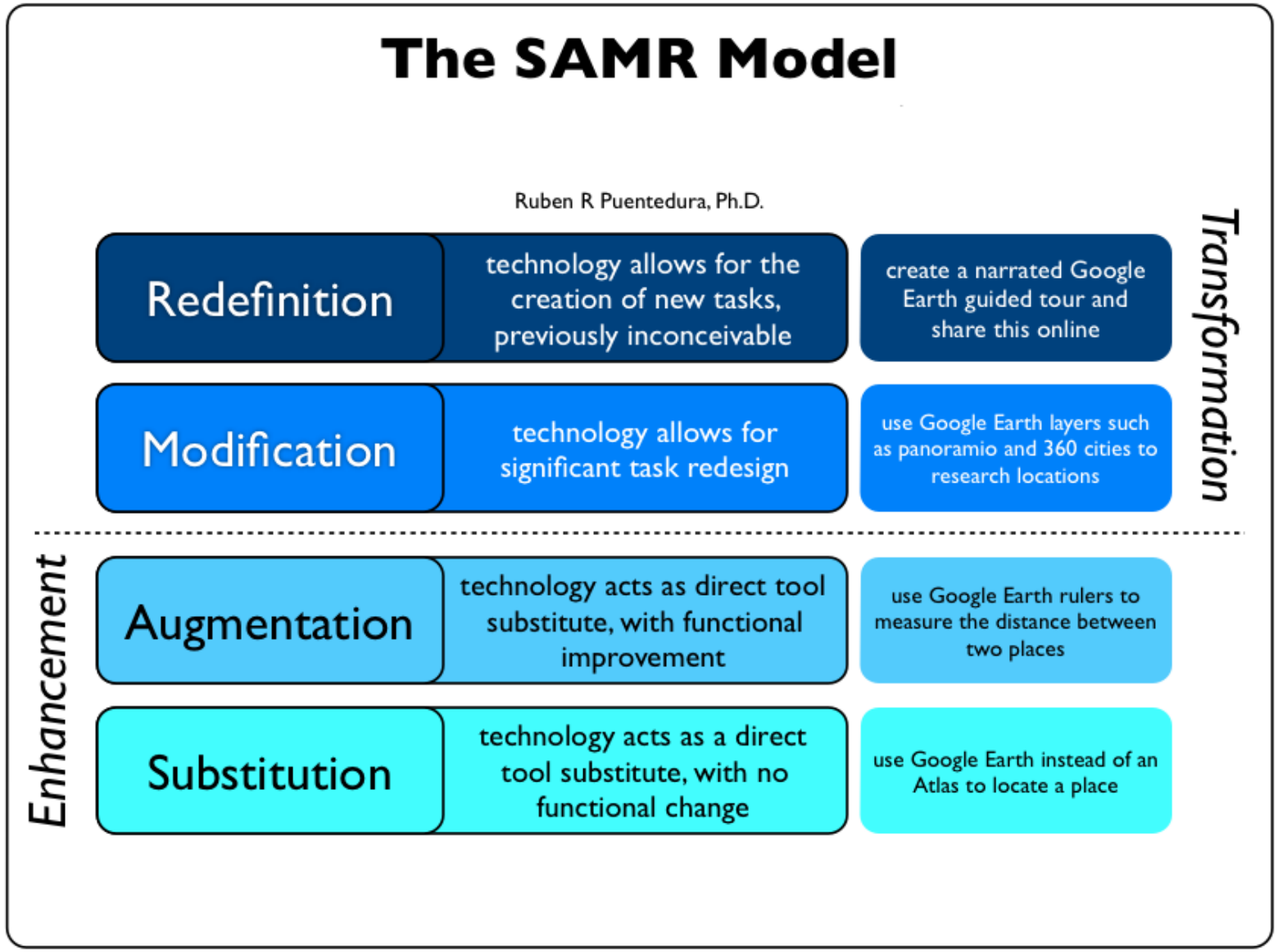
- Being competent on fundamental professional knowledge and skills
  - Allows interdisciplinary synthesis
- Diffusion of inclusive education culture
  - Inclusion of language, culture, talents, handicapped students, gender equity
- Gaining Human skills
  - Ethics, emotional intelligence, cultural awareness, respect for others
- Being Learning Community and Learning Organization

Frameworks for Technology Competencies

- SAMR (Puentedura, 2006)
- TPCK (Mishra & Koehler, 2006)
- ISTE Standarts (ISTE, 2017)
- UNESCO Competency Framework v3 (2018)
- Partnership for 21st Learning (2019)
- Teacher Technology Competencies (Falloon, 2020)

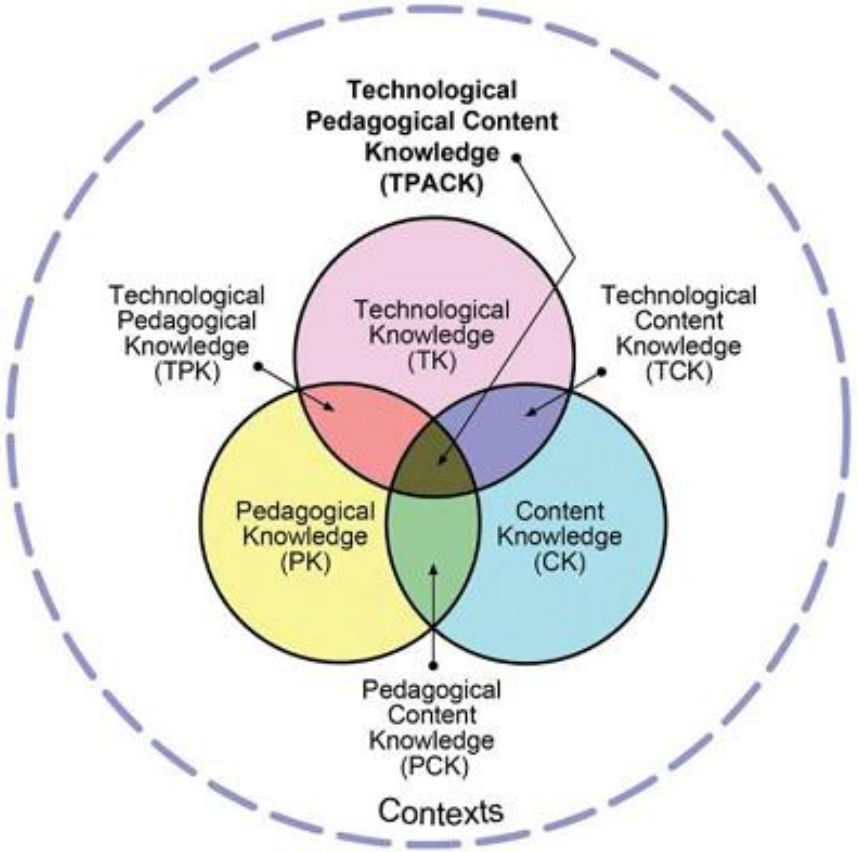
SAMR Framework (Puentedura, 2006)

- **S**ubstitution
- **A**ugmentation
- **M**odification
- **R**edefinition



Technological Pedagogical Content Knowledge (Mishra & Koehler, 2006)

- In order to develop a plan to support teaching activities with technology, we need to consider capabilities of technology, nature of the teaching content, and instructional method used



ISTE Standards for Teachers (ISTE, 2017)

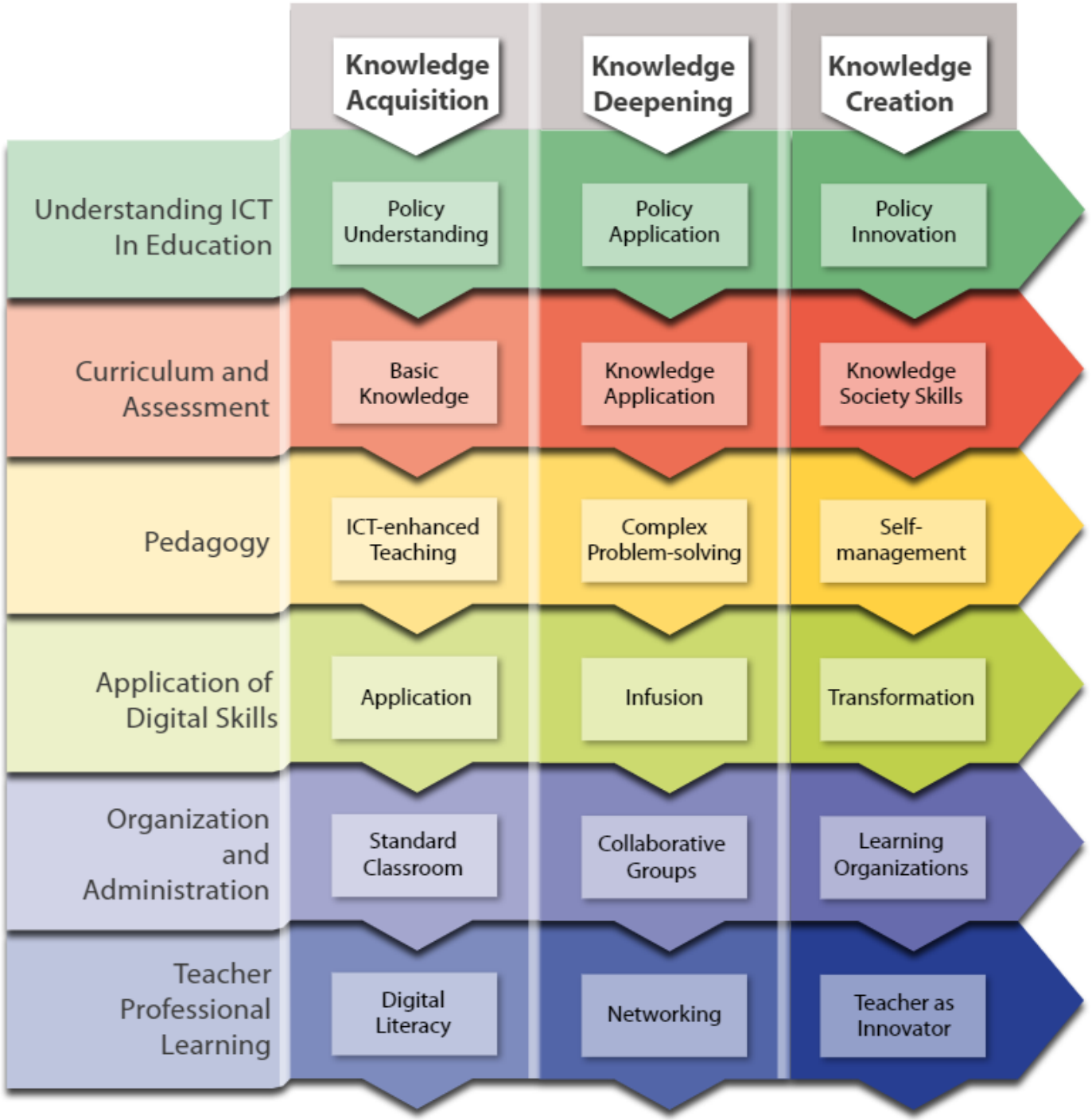
- ISTE (International Society for Technology in Education) prepares technology standards for teacher, students, and education leaders, last updated in 2017
- For teachers ISTE defined 7 major standards in two groups

Empowered Teacher
- Learner
- Leader
- Citizen

Learner Accelerator
- Collaborative
- Designer
- Facilitator
- Analyzer

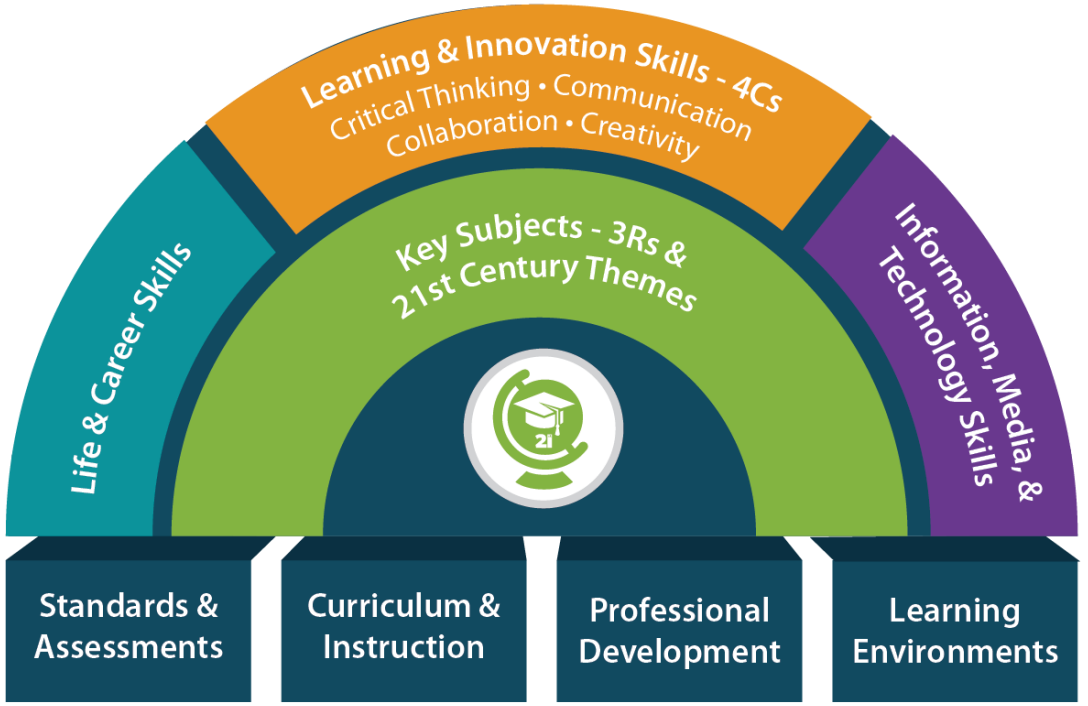
UNESCO Competency Framework

- A 6 field and 3 stage competency matrix by UNESCO
- Three versions have been published so far; 2008, 2011, and 2018



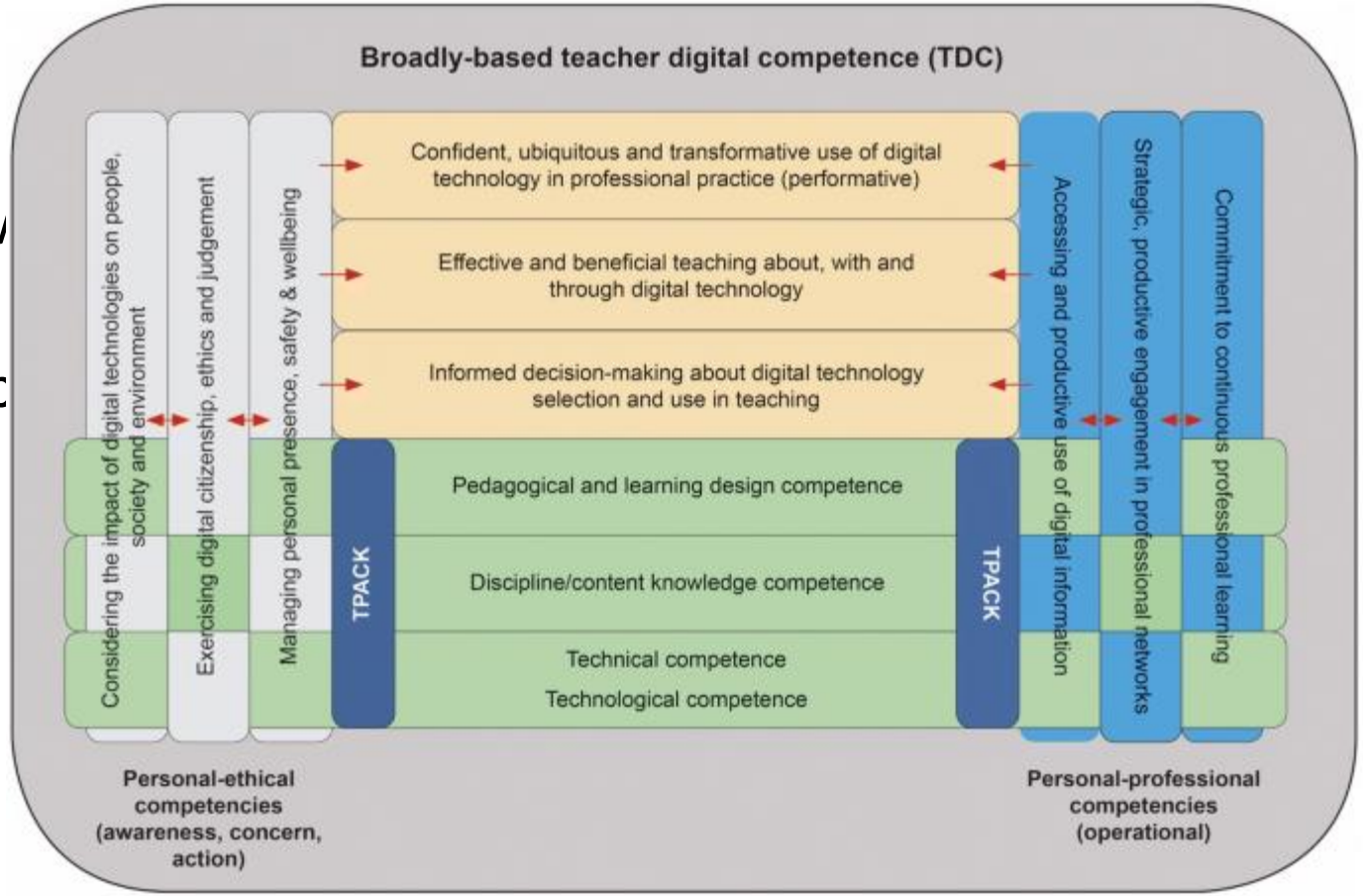
P21 Learning Framework (2019)

- Partnership for 21st Century Learning
- Life and Career Skills
- Learning and Innovation Skills
- Information and Technology Skills
- Integrating skills to all courses



Teacher Technology Competencies (Falloon, 2020)

- List of teacher digital competencies
- 4 major components
  - Use of digital technologies
  - Technological pedagogical know
  - Ethical competencies
  - Professional development comp



Common Goals of Competency Frameworks

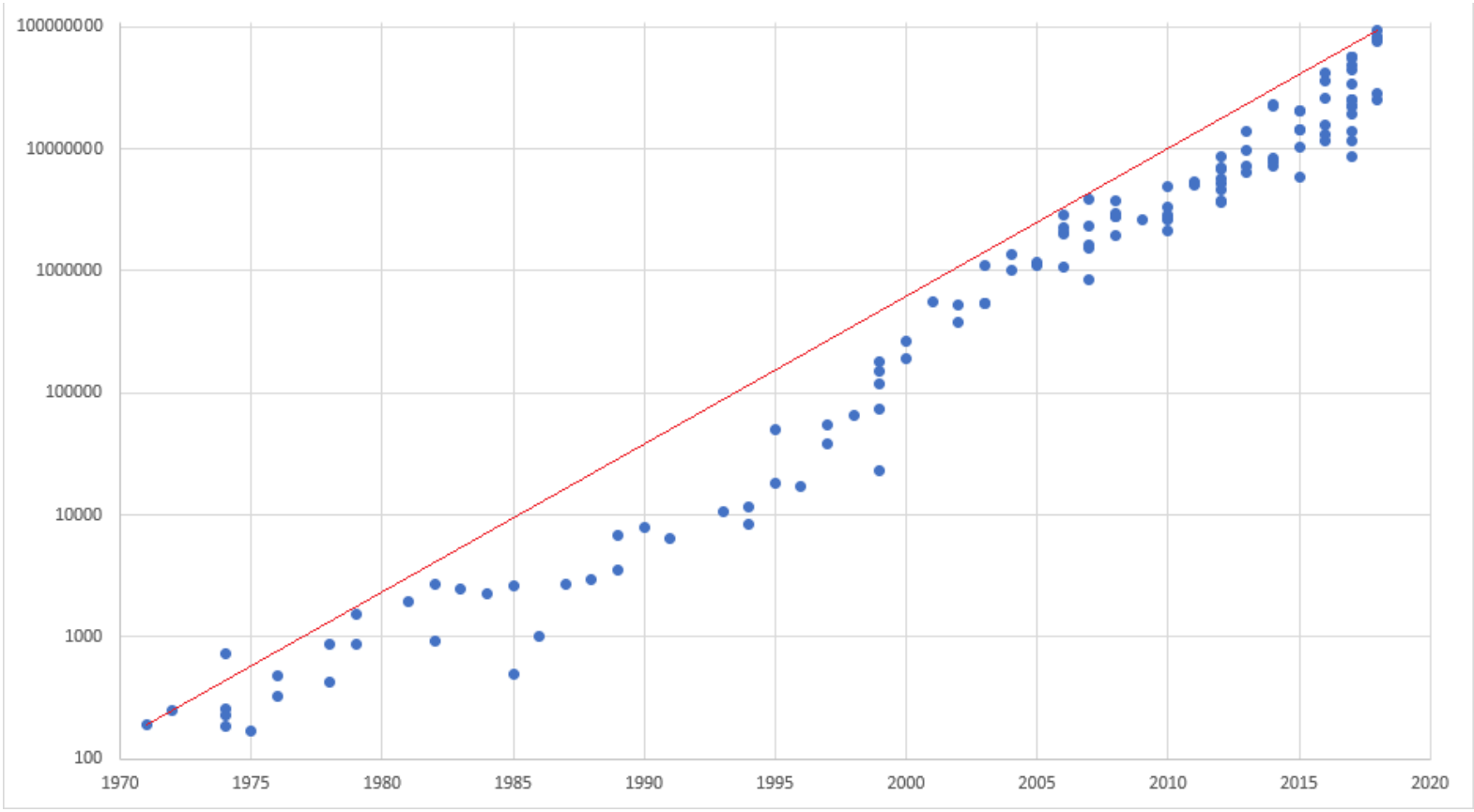
- All existing competency frameworks (and probably all future frameworks) have common goals
- Instructional objectives
- Curriculum
- Instructional strategies and methods
- Learning environments
- Measurement and assessment
- Professional development

Why Teacher Technology Competencies Change Over Time?

- Two drivers of developments in information and communication technologies
  - Increase in hardware capacity and speed
  - Increase in data volume over the internet

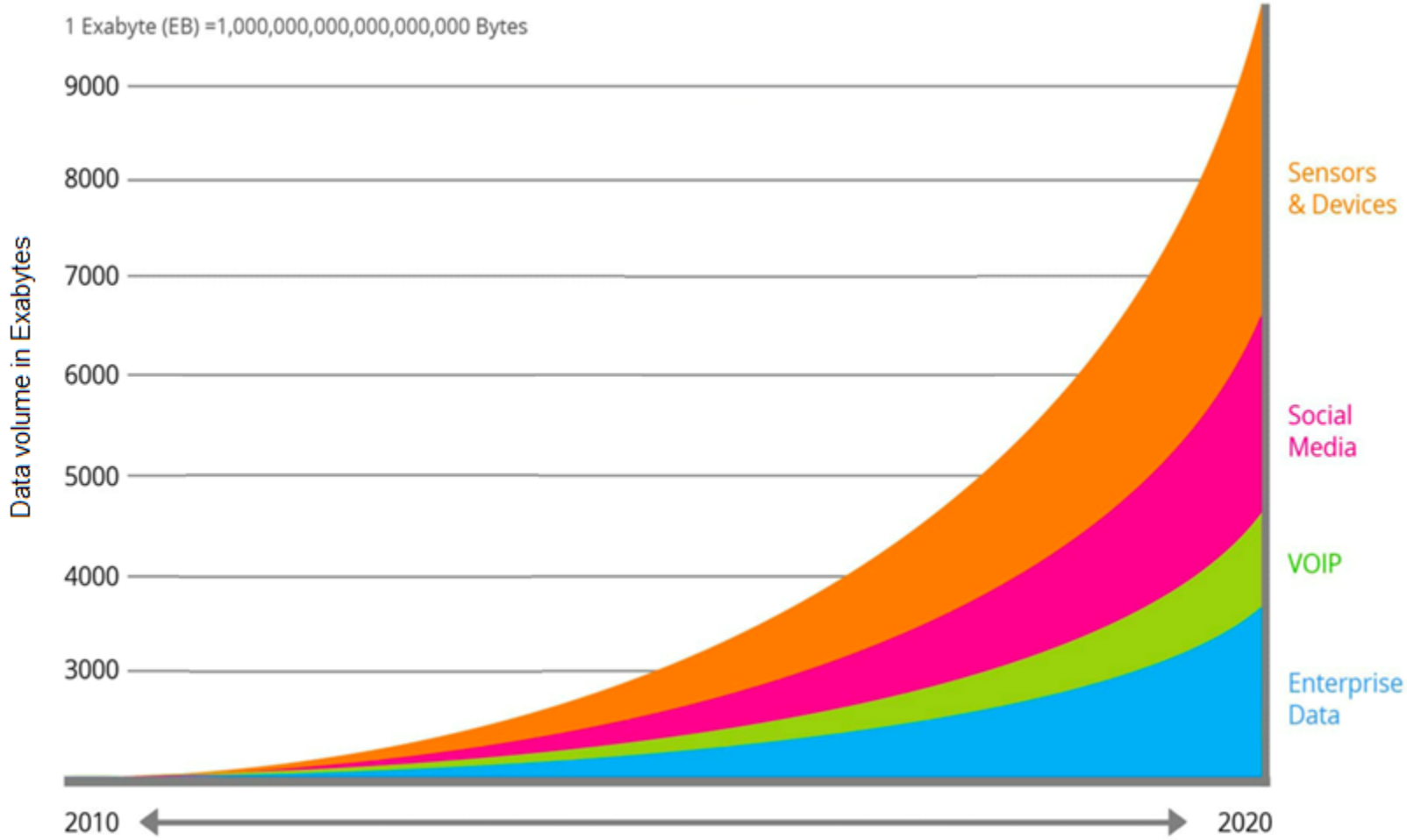
Increase in Hardware Capacity and Speed

- Number of transistors in mm^2
- 1970-2020 trend
- More transistor = Better processor power



Source: https://medium.com/predict/moores-law-is-alive-and-well-eaa49a450188

Increase in the Data Volume over the Internet



Current and Near Future Trends

- Mobile and Cloud Techs
- Data Sciences
- Artificial Intelligent
- FinTech and BlockChain
- Autonomous vehicles and transportation systems
- Internet of things
- Advanced manufacturing
- Autonomous agriculture
- Assistive robots and humanoids
- Smart cities and homes
- Social networks
- Virtual and augmented reality
- Business intelligence

Competencies and Tools

- Using visual literacy tools
  - Creating visual materials (i.e. Canva, Noun Project, Grafio 3)
  - Creating infographics (i.e. Venngage, Piktochart)
- Interactive video and animation tools
  - Creating interactive videos (i.e. Snagit, ExplainEverything, Google VR Tour Creator)
  - Creating digital story (i.e. Sway, Storyboardthat)

Competencies and Tools

- Developing learning environments
  - 3D virtual (i.e. OpenSim, MineCraft and add-ons)
  - Mobile (i.e. MIT App Inventor, Thunkable, Appypie, Andromo, outsystems)
  - Game (i.e. MS Kodu, UnityLearn, Stencyl)

MIT
APP INVENTOR

stencyl

Competencies and Tools

- Using cloud based collaborative tools
  - Creating and editing documents
  - Creating and editing graphics
  - Creating and editing designs
  - Project management

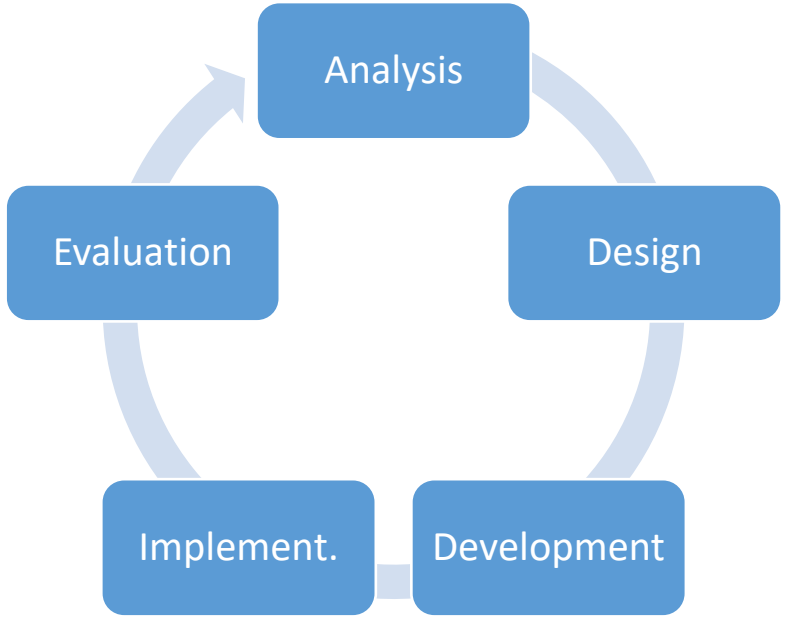
Competencies and Tools

- Using digital assessment tools
  - Kahoot
  - Socrative
  - Google Forms
  - Mentimeter
  - Developing word games (i.e. Educandy)
- Using online learning tools and environments
  - Learning management systems (i.e. Google Classroom, EdModo, Moodle, Canvas)
  - Synchronous course tools (i.e. Zoom, Meet, Teams, Prezi)
- Contributing to open courseware (i.e. OCW, Udemy, Coursera)

socrative

Competencies and Processes

- Applying problem solving process with information and communication technologies
  - Computational thinking / Algorithm developing
  - Coding
  - Robotics
  - 3D design and printing
  - Digital storytelling
  - Gamification



Teacher Technology Competencies

- Supporting teaching and learning process with technology based on sound pedagogical approaches
- Using information and communication technologies in ethical and safe way
- Being aware of human computer interaction principles
- Creating learning communities and learning organizations

Part 3: Tools For Collaborative Online Teaching

- Collaborative tools are capable of not just sharing the content but also creating the content together with other users
- In the past, users were passive information consumers (Web 1.0)
- Web 2.0 (dynamic web technologies) allow users to create content

Part 3: Tools For Collaborative Online Teaching

- Nowadays there are tons of collaborative working tools for business and education uses
- Some examples to be used in collaborative online teaching
- Document creating (Google Docs, Office 365)
- Drawing (Aggie.io)
- Concept map creating (Mind42)
- Discussion tools (Kialo)
- Project management / monitoring (Trello)

Part 3: Tools For Collaborative Online Teaching

- Challenges in implementing collaborative online learning
  - Generating original ill-structured problems
  - Requires time and energy from student and instructor side
  - Limited plagiarism check in some tools
  - Need Artificial Intelligence tools for monitoring student progress and feedback
  - No All-in-One Platform

Questions

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Comments

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